# BEETON'S DICTIONARY

UNIVERSAL INFORMATION.

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## (BEETON'S)

## SCIENCE, ART,

ANI

## LITERATURE.

## A DICTIONARY OF UNIVERSAL INFORMATION.

COMPRISING

A COMPLETE SUMMARY OF THE MORAL, MATHEMATICAL, PHYSICAL, AND NATURAL SCIENCES;

A PLAIN DESCRIPTION OF THE ARTS:

AN INTERESTING SYNOPSIS OF LITERARY KNOWLEDGE;

WITH THE

PRONUNCIATION AND ETYMOLOGY OF EVERY LEADING TERM.

CONTAINING

NINETEEN HUNDRED AND EIGHTY COLUMNS

YZD

UPWARDS OF SIX HUNDRED ENGRAVINGS.

VOLUME I.



#### LONDON:

WARD, LOCK, & TYLER, WARWICK HOUSE,
PATERNOSTER ROW.





THE first "BEETON'S DICTIONARY OF UNIVERSAL INFORMATION" furnishes a full and satisfactory account of Geography, History, Biography, Mythology, and Biblical Knowledge, together with a reliable Chronological Record. Its readers are supplied with information as to every person in sacred and profane history to whom the attention of mankind has been drawn, as well as with a succinct account of every place upon the globe, of importance in a geographical, historical, or industrial sense. In brief, the first "BEETON'S DICTIONARY" supplies a vast body of facts in so far as they relate to the Names of Persons and Places.

In this second "BETON'S DICTIONARY" is given to the non-scientific and general reader a full and faithful account of the forces which animate Nature, and which are incessantly acting upon mankind,—of the elements of which all things are composed,—of inventions of every kind, and of every art and process to which the genius of man has given birth; in other words, here is presented an immense and interesting body of facts, in so far as they relate to Things.

There already exist, it must be admitted, a great number of works which are intended to meet this want, such as the Dictionaries of Language, or Lexicons, and the many large Encyclopædias of various kinds; but the first of these works, by the very nature of their plan, can only supply a bare definition of words, without penetrating into the nature of the things which those words designate. In the Encyclopædias, which are professedly published to accomplish that which is beyond the province of the Lexicon, long dissertations, complete technical treatises even, are given, rather than concentrated notices; the volumes attaining such vast proportions as to place them far beyond the reach of the great mass of the reading public. Too high in price, too slow in growth, too unhandy, unwieldy, and diffuse, these important tomes suggest a want that can only be supplied by such a work as this, which, without being as bare and unsatisfactory as the dictionaries of language, without being as bulky and expensive as the encyclopædias, nevertheless furnishes, in the closest, tersest, and most exact manner, the essence, the substance, the indispensable information upon each subject. By the employment of brevity of expression and a well-considered plan, this essential knowledge is collected into a single volume, cheap in price, portable in size, and convenient for reference; in a word, in a Practical Encyclopædia, where everything finds a place upon which something useful or profitable may be said.

In the compilation of the different articles in this Dictionary, a uniform plan is followed. Immediately after the name of each leading word there are placed its pronunciation and its etymology, to serve the double purpose of giving a clearer meaning to it, and as an aid to its remembrance. Next follows its scientific definition, an account of its essentials and characteristics, its divisions and usual classifications, its uses and appliances in Science, the Arts, or Literature. The article terminates, when there is occasion, with an historical notice, which gives an account of the origin and growth of each Science and Art, with the date of its discovery or first application. Finally, there are added to the principal articles bibliographical notices, which indicate the best works published on each subject.

As for the style, the very nature of the work demanded that the greatest number of facts should be grouped together in the fewest words,—that the motto should be Res, non verba. It was indispensable, then, that the style should be laconic, without ceasing to be clear; also, it was necessary that it should be scrupulously exact. No weak, periphrastic mode of expression would serve to give a proper and foreible description of a mineral, a vegetable, an animal,—of the analysis of a substance, or the demonstration of a theorem.

The natural terms, as written by mineralogists, botanists, zoologists, chemists, and mathematicians, are here used; but in such a way that the ordinary reader is enabled to understand them, without missing a shade of their meaning. Further, especial care is

Vi PREFACE.

taken, by means of cross-references, to explain in alphabetical order whatever terms might present any difficulty. Again, by the plentiful use of cross-references, the work is made more completely its own index than an Encyclopædia is in general found to be.

In order to insure harmony throughout this Dictionary, no less than to avoid those contradictions, omissions, repetitions, or false references, which too often disfigure works of the kind, it has been the duty of one of its editors to pay especial attention to those matters of detail—to revise all the articles, and to make all fit each other as the links of one chain.

It may be safely asserted, that this work, brought down to the latest stage of know-ledge, will be found to present a combination of that scientific, literary, and artistic information, which is, at the present time, regarded as the indispensable condition of any education pretending to be serious and complete.

This work has been compiled with the care demanded by its importance. The extraordinary impulse which scientific knowledge has received within the last quarter of a century,—the grand discoveries which have been made,—the marvellous applications to which these discoveries have been turned, have opened the eyes of the people to the truth of the declaration that "knowledge is power," and have caused the study of science to become especially attractive to the minds of the great mass of the community.

To meet, then, this desire for scientific knowledge is the aim of BETTON'S DICTIONARY." Collecting into an harmonious whole—into a single volume—all the precious information which is scattered through scores of learned treatises, or buried in the depths of vast encyclopædias, presenting it to its readers in the briefest, simplest, and most exact manner, this work brings within the reach of the many that knowledge which has too long been reserved for the few. To the general reader it gives a full definition of those technical terms with which he is constantly meeting in the newspapers, in the magazines, in conversation even, and which are, too frequently, enigmas to him. It gives an account of machines and processes he every day sees without comprehending. It recalls to the mind of the student, sometimes perhaps even to the expert, the elements and the essential properties of a chemical combination; the distinctive characteristics of a class or of an order in botany, in zoology;—it points out to the uninitiated the nature and classification of the animal kingdom; and, in medicine, it defines the symptoms of those diseases which assail mankind. If it is not possible for it to give an exhaustive reply to every question, it does, at any rate, thanks to its bibliographical notices, point out to the earnest inquirer the sources where he may obtain an abundant response.

Designed, then, like the "DICTIONARY OF HISTORY, BIOGRAPHY, AND GEOGRAPHY," to meet a real want, conceived in the same spirit, of the same form and proportions, executed by the same editors, with competent auxiliaries, the "DICTIONARY OF SCIENCE, ART, AND LITERATURE" becomes the inseparable companion of its predecessor. The two volumes, in a word, form the separate moieties of a complete whole,—each being incomplete without its fellow.

THE New Edition of this work has had bestowed upon it an amount of labour and care which was due to the important character of the original enterprise. Technical Education has become one of the most pressing necessities of our time; and the future of individual and national prosperity depends greatly on the diffusion of this kind of knowledge. The revising editor has been especially attentive in adding, amongst the new articles which appear in this work for the first time, every new and profitable subject in connection with the Useful Arts; and he has felt the same anxiety to incorporate, in articles which have before appeared, all the latest and most definite information. new feature, worthy of notice, the full-page engravings form, in the present edition, a collection of illustrations of the Arts and Sciences, of Natural Phenomena, and of other subjects included in the scope of the Dictionary, which will themselves testify to the unsparing cost and trouble which have been spent upon the present issue. Unique in its aim, alone in the fulness and clearness of its information, and fertile in the abundant mass of materials for thought and work, "BEETON'S DICTIONARY OF SCIENCE, ART, AND LITERATURE" has claims upon the public estimation which it has never failed to receive, and which the volume now completed will strengther and confirm.

### THE PRONUNCIATION.

In this volume the Pronunciation, printed in *Italics*, immediately follows each leading Term. This pronunciation is shown, for the most part, by a combination of letters about the sound of which there can be no doubt. Here follow, however, together with the sounds they indicate, such letters as might seem to require explanation:—

#### VOWELS.

Where	a is	used	 it is sou	inded as	•••	a	in bar, car, omega, Africa.
"	ă	,,	,,`	"		a	in can, fan, tan.
,,	à	,,	,,	,,		а	in fate, hate, late, gray.
,,	aw	,,	,,	,,		а	in fall, tall, wall; and
						0	in for, lord, sterm.
,,	E	"	,,	,,		$\boldsymbol{c}$	in get, let, net.
,,	ce	,,	"	,,		e	in greet, steep, weep.
,,	oi	,,,	"	,,		oi	in oil, broil; and
						oy	in coy, deploy.
,,	ou	,,	,,	,,		ou	in bound, hound, mound; and
						ow	in bow, how, now.

#### CONSONANTS.

Where ch is us	sed it	is sound	led as	ch	in birch, lurch; and
Ø				tcl	r in ditck, kitch.
,, g ,,		,,	,,	g	in gas, gone, big.
,, j ,;	,	,,	,,	g	in gentle, pigeon; and
				j	in jade, jet, jot.

## LIST OF ABBREVIATIONS.

Λ mr. •.	Agricultura	Juris	Inviangudance
Alch.	Alabama	Lat.	
Alg.		Lėgis	
Anat		Lib.	
AngNor.		Lit	
		Log.	
AugSax		Mach.	
Ant		Mar.	
Arab		Math	
Arch		Mech.	
Archæol.		Med.	
Arith,		Met.	
Astron		Metall.	
Bibl			
Bot		Meteor	
Cap		Mil	
Charac		Min	
Chem.		Mus.	
Civ. Eng.		Myth.	
Civ. Law		Nat. Hist	
Com	3	Nat. ord	
Conch		Numis.	
Dipl		Opt	
Dram. Lit		Ord	
Du		Orn	
Dyn		Paint,	
Eccl. Law		Path	
Eng.		Persp	
Eut		Pharm	
Fam		Phil	
Fin		Phys	
Flor		Physiol	
Fr		Pol	
Gen	i i	Pol. Eco	
Gener.		Psychol	
Geog		Ref	
Geol	Geology.	Rhet	
Geom		Rom	
Ger		Sculp	
Gr		Sp	
Gram	Grammar.	Surg	
Hab	Habitat.	Theol	
Her	Heraldry.	Ther	
Hor	Horology.	Var	
Hort		Veg. Anst	
Hyd	Hydraulies.	Veg. Phys	
Hydros	Hydrostatics.	Vers	
Ital.	ichthyology.	Vet. Surg.	
Ital.	Italian.	Zool,	Zoology.

### DICTIONARY OF UNIVERSAL

### INFORMATION.

A, the first letter of the alphabet in almost every A, the first letter of the alphaset in almose every known language (the only exceptions, probably, being the Rihiopic and the Runic; in the former of which it occupies the thirteenth and in the latter the tent place). This, doubtless, is owing to the great simplicity of its sound, it being the letter which is most easily and naturally uttered by the organs of speech. In the continental and Oriental languages it varies less than in Furtible Append the sea tleast four distinct sounds known English, where it has at least four distinct sounds, known as the long or slender, the broad, the short or open, and the middle; as in name, call, man, father. In Grammar, A is styled the indefinite article, and denotes one or any; s, a man. In Music, A is the nominal of the sixth note as, a man. In Music, A is the nominal of the sixth note in the gamut: it is also the name of one of the two natural moods, and is the open note of the second string of the violin, by which the other strings are tuned and regulated. In Logic, A denotes a universal affirmative proposition; and in Algebra, a, b, c are used to represent known quantities, while the last letters, x, y, z, are generally taken to denote unknown quantities. As a wareard of around the Greaks denoted 1, and with a numeral, a', among the Greeks, denoted 1; and, with a mark under it, a, 1,000. With the Romans, A was 500; and, with a short horizontal line over it, A, 5,000. 500; and, with a short horizontal line over it, Å, 5,000. In trials of criminal causes among the Romains, A signified absolvo, I acquit; and was hence called litera salutaris, the saving letter. When put to bills of exchange in England, A signifies accepted. A 1 is a symbol by which first-class vessels,—that is to say, vessels whose hull and equipments are in an efficient condition,—are known and registered at Lloyd's for a certain number of years after being built. A A A, in Chemistry, signifies amalgama, to mix; and in Pharmacy, ā, w āā, denotes that the proportions of the ingredients to which it refers are to be equal. A is frequently used as an abbreviation. (See Aubertylemon)

AAM, or HAAM, awm, a Dutch liquid measure, con

AAM, or HAAM, awm, a Dutch liquid measure, containing 288 English pints.

AARD-VARK, ard-park (Du. earth-pig), in Zool., a genus of animals which belongs to the class Mammalia, and to the ord. Edentata. It feeds upon insects and roots, and burrows in the ground. It is noturnal in its habits, and passes the greater portion of its time in eating and sleeping. Aard-Vark is the name given by the Dutch at the Cape of Good Hope to the Orycteropus capensis, a species now dissunited from the Myrmecophaga, or Ant-caters of Linnaus, with which it was formerly classed. It lives entirely upon ants, and in this respect resembles the Echidnes of Australia, the Myrmecophaga of America, and the Pangolius of Asia; fulfilling the same purposes in Southern Africa which these species fulfil in their respective countries. respective countries.

respective countries.

ARD-WOLF, and -woolf (Du. earth-wolf), a genus of digitigrade carnivorous mammals founded by Isidore Geoffroy St. Hilaire, and forming the link which connects the civets with the dogs and hyænas. It is an extremely singular animal, having externally the appearance and bone-structure of the hyæna united to

the head and feet of the fox, with the intestines of the civet. It was brought from Africa to Europe some years ago by the traveller Delalande. Its size is about that of a full-grown fox, which it resembles in both its habits and its manners, being necturnal, and constructing a subterraneous abode.

An, āb, in Hebrew chronology was the fifth month of the ecclesiastical and the eleventh of the civil year, and always contained thirty days. It corresponded to the latter part of our July and beginning of August.

ABACA, a'-ba-ca, a kind of flax or hemp grown in the Philippine Islands.

the Philippine Islands.

ABACISCUS, üb-a-sis'-kus, in Arch., a diminution of the term Abacus, only seldom used; but, when it is, chiefly applied to the tiles or squares of a Mossio pavement.

ABACK, &-bāk' (Ang.-Sax.), the situation of the sails when they are pressed against the masts by the force of the wind. Thus the sails are said to be "taken aback" when, by a change of wind or otherwise, they are placed in that position.

ABACCT, &b'-a-kot (deriv. uncertain), a cap of dignity,

formerly worn by the kings of England.

armenty worn by the kings of England.

ABACUS, &b'-a-kus (Lat. abacus, counting-table, level tablet, &c.), in Arch., a constituent part of the capital of a column, which supports the horizontal entablature. In the Tuscan, Dorie, and Ionic orders, it is flat and square; but, in the Corinthian and Composite orders, its four sides are arched inwards, with, generally, a rose in the centre. Vitruvius says it was meant to regre.

meant to represent a tile upon a basket, and attributes its invention to Callimachus, who, observinga bas ket covered with tile placed over the root of Αn acanthus plant(see Acan-THUS), was so struck with its



ABACUS.

appearance, that he imitated it in sculpture, by making appearance, that he imitated it in sculpture, by making the whole group the capital of a column, in which the tile was represented by the abacus, the growing leaves of the acanthus by the volutes, and the basket by the body of the capital. In Gothic architecture, the abacus was very variously employed, according to the fancy of the architect.

ABACUS, in Arith, is the name of an instrument employed in England to teach the elementary princi-ples of the science of numbers. The Pythagorean abacus is a term sometimes applied to the multiplica-

abacus is a term sometimes applied to the multiplica-tion table. The ancient mathematicians also employed the term abacus to designate a table covered with sand, upon which they traced their diagrams. Abacus, Chinese, or Shwan-Pan, shwun-Pan, is also an instrument for facilitating arithmetical calculations. It consists of several series of beads or counters strung upon brass wires stretched from the top to the bottom.

of an instrument, and divided in the middle by a crosspiece from side to side. In the upper compartment every wire has two beads, which each count for 5; in the lower space every wire has five beads of different values; the first being counted as 1, the second as 10, the third as 100, and so on. In this country, with our system of reckoning, such an instrument could not be made generally applicable to arithmetic; but in China, where the entire system is decimal, that is, where every weight and measure is the tenth part of the next greater one, the abscus is used with wonderful rapidity. A similar instrument was in use among the Greeks and the Romans; and the Russians calculate by strings of beads. In this country a chequer-board, such as is still sometimes to be seen langing out as a sign at the doors of public-houses, was formerly used as an abacus. There is also a chemical abacus, which, in 1839, was introduced to the notice of the British Association by Dr. Reid. It was designed to give to students a more accurate knowledge of the elements of which the more important chemical compounds are constituted. was constructed of a wooden frame with cross wires, upon which beads were strung. Each of the wires represented a chemical element, and each of the beads

represented a chemical element, and each of the beads an atom, while, at the extremittee of the wires, the names of the elements were placed.

ARAFT, or AFT, &-boff" (Ang.-Sax.), in Maritime language, signifies the hinder part of a ship; thus,—"abaft the main-mast," that is to say, between the main-mast and the stern. "Abaft the beam," signifies the relative situation of an object in some part of the horizon contained butween a line drawn at right sudges. horizon contained between a line drawn at right angles to the keel and the point to which the stern of the

ship is directed.

ABAGI, or ABASI, a-ba-jse', a Persian coin, of about the value of eighteen pence English.

ABAMDONMENT, d-bān'-dun-ment, a term made use of in marine insurances, where, prior to compensation being demanded for the loss of a ship or goods, the owner must abandon or make over to the insurer his

owner must abandon or make over to the insurer his entire interest in any portion of the rescued property.

Araser, or Araissi, a-baised (lowered), in Heraldry, a term borrowed from the French, and applied to the wings of eagles, &c., when the tip inclines downwards to the point of the shield, or when the wings are shut.

Arauser, a-baid-ment (old Fr. abater, to heat down, to destroy), in Law, a terps signifying the rejection of a suit on account of some fault either in the matter or proceeding. Hence, a "pleain abatement" is some exception alleged against the plaint may abate or cease. It is the rule, however, that he who takes advantage of a flaw to plead an abatement, must not advantage of a flaw to plead an abatement, must not advantage or a new to plead an abatement, must not only indicate the flaw in question, but likewise point out its remedy. When the plea of abatement is granted, all writs in the process must begin de nove. Both public and private nuisances may be peaceably "abated," or overcome. Thus, if a person be unlawfully annoyed or done damage to, it is a private nuisance, and he may abate or destroy the nuisance, provided he shall not disturb the public peace, nor inflict further injury upon the thing than is necessary to get rid of the nuisance which sanoys or damages him. An obstruction of a public road, such as a gate being thrown across it, constitutes a public nuisance. and a person may abate or overcome such nuisance, provided he does no more than is absolutely required for the accomplishment of his purpose. Coke, in his Comments upon Littleton, declares that it is "an abatement when a man dies seized of an estate of inheritance, and between the death and the entry of the heir a stranger doth interpose himself and abate."

stranger doth intespose himself and abate."

ABATHMENT, in Heraldry, is an accidental figure added to a coat of arms, to lessen its true dignity, and to indicate some stain in the character of the bearer.

ABATHMENT OF LEGACHS. (See LEGACY.)

ABATHS, OF ABATHS, a-ba-te', ā-bat'-tis (Fr. abattre, to knock down), a term used in Fortification, and signifying a work constructed of felled trees, placed side by side, with their branches, the stronger of which are left on, turned towards the enemy in such a way as to constitute a form of defence for the troops posted behind them.

ABATTOIB, ab'-ā-twor (Fr. abattre, to knock down), a term borrowed from the French, with whom it signi-

fles a slaughter-house. The Abattoir system was, in 1818, adopted in France. There are at present near Paris five immense establishments of this kind, where butchers are provided with a place for slaughtering their cattle and keeping their meat in store. There are also places for supplying the beasts with water, receptacles for the fat, hoofs, blood, brains, &c. In the neighbourhood of the abattoirs there are manufactories of blood-manure, gelatine, glue, and the other products of the offal. In most of the continental towns, and in several of the larger cities of the American Union, slaughter-houses are placed under similar regulations to those which are in operation in Paris. In 1851 a large and commodious abattoir was established in Edinburgh. In 1855 the great cattle-market, which in Edinburgh. In 1855 the great cattle-market, which had been held in Smithfield for upwards of 500 years, was removed to the north of London, where a new market was built upon an area comprising 15 acres of ground. This large inclosure is capable of containing 6,600 oxen, 1,425 calves, 900 pigs, and about 35,000 sheep. It also can give lairage to 3,000 oxen and 8,000 sheep, and has excellent slaughter-houses. This is the only approach as yet made to the abattoir system in London.

ABBA, ab'-ba, a Syriac term signifying father. Among the Jews, it was a title of dignity. The Christians of the East apply it to their bishops.

ABBA, &b'-bai (Fr. abbé), is the French term for an abbot. Before the Revolution, it was a title assumed by a proproposity and the statement of the st by a very numerous class of persons, who had little or no connection with the Church. Some of them were distinguished men of letters, or rose to eminence in the state; while many of them were engaged, less prominently, in public or private tuition.

ABBESS, ab'-bess (Fr. abbesse), the superior of an abbey or convent of nuns. An abbess exercises the same authority over nuns that an abbet does over monks, spiritual functions alone excepted. It was decreed by the council of Trent, that an abbess, before entering upon her functions, should have attained the

age of 40 years.

ABBEY, ŭb'-be (Fr. abbaie), a religious house, presided over by an abbot or abbess; when the superior was a prior, the establishment was called a priory; otherwise, there was little or no distinction between them. These houses were wholly abolished in England by Henry VIII., at the time of the Reformation. According to Bishop Tanner's "Notitia Monastica," 506 religious houses were then suppressed, the revenues of which amounted to about £132,000 per annum; but other authorities make their wealth much greater. In the early part of the French monarchy, dukes and counts, though secular persons, were termed abbots, in conse-quence of the possession of certain abbeys having been conferred upon them.

Amor, wh-tot (Ang.-Sax. abbod), the chief ruler of a monastery, or abbey of monks. The term comes from the Hebrew ab, through the Greek abba, father. At first abbots were subject to the bishops, and even to the pastor of the parochial district within which they were established. Afterwards, however, they assumed greater power, and aspired to even equal rank with the bishops, which led to frequent vexations disputes in the Church. Distinctions also arose among abbots;—as mitred, those privileged to wear the mitre, and exercise episcopal authority within their respective precincts; crosiered, so named from their carrying the crosier, or pastoral staff; ccumenical, such as exercised universal dominion; and cardinal, from their superiority over all others.

ABBERVIATION OF FRACTIONS, üb-bre-vs-ai'-shun (Lat. brevio, I shorten), in Arith., a term signifying the reducing of fractions to the lowest terms, a process which is performed by dividing both the numerator and denominator by any term which will divide them without leaving any remainder; thus, 12 becomes equal to 1/2, to 3, and, finally, to 3, if divided in succession by 2.

ABBERVIATION, the contracting of a word or some

ABBLEVIATION, the contracting of a word or sentence, by omitting some of the letters or words, or by substituting certain marks or characters in their place. Abbreviations were much used by the earlier writers. The Greeks and Romans largely employed them, and, most of all, the Jewish rabbins. At the present time they are chiefly confined to titles, dates, and a few

#### Abbreviation

phrases. Most of the arts and sciences, however, have sets of signs or abbreviations peculiar to themselves. The following is a list of the more important abbreviations in common use :-

A. Associate.

A. A. Associate.
A.A. Associate of Arts.
A.B. Able Seaman.
Abp. Archbishop.
A.C. (Ante Christum). Before Christ.
A.D. (Anno Domini). In the year of our Lord.
A.E. R.A. Associated Engraver of the Royal Academy.

A.E. i.A. Associated Engraver of the Royal Academy.
A.H. (Anno Hegiræ). In the year of the Hegira.
A.M. (Anto meridiem). Before hoon.
A.M. (Anno mundi). In the year of the world.
A.R.A. Associate of the Royal Academy.
A.R.S.A. Associate of the Royal Scottish Academy.
A.U.C. (Ab Urbs condita). From the building of the

city, i.e. Rome B.A., or A.B. (Artium Baccalaureus). Bachelor of

Arts.
B.C. Before Christ.
B.C.L. Bachelor of Civil Law.

B.D. Bachelor of Divinity. B.M. Bachelor of Medicine.

Bp. Bishop.

Bi., or Bart. Baronet.

C. (centum). A hundred; chapter; commissioner.

C.A. Chartered accountant. C.B. Companion of the Bath.

C.C. Caius College. C.E. Civil Engineer. Clk. Clerk.

C.M.G. Companion of the Order of St. Michael and St. George.

C.P.S. (Custos Privati Sigilli). Keeper of the Privy

Cr. Creditor.

Crim. Con. Criminal conversation.

Ct. Count. Cwt. Hundredweight.

D. Five hundred.

D.C.L. Doctor of Civil Law.

D.D. Doctor of Divinity.
D.F. (Defensor Fide)). Defender of the Faith.
D.G. (Dei gratid). By the grace of God.
Do. Ditto. The same.

Dr. Doctor; destor.
12mo. Duodecimo.
D.V. (Deo volente). God willing.
Dwt. Pennyweight.

E. Rast.
E.C.P. (Evangelii Christi Pradicator). Preacher of the gospel of Christ.

Example and invariable. the gospel of Christ.
e.g., ex. gr. (Exempli gratid). For example,
Etc. (Et catera). And the rest; and so on.
F.A.S. Fellow of the Antiquarian Society.
F.L.S. Fellow of the Botanical Society.
F.C.S. Fellow of the Chemical Society.
F.L.S. Fellow of the Geological Society.
F.L.S. Fellow of the Linnean Society.
F.L.S. Fellow of the Linnean Society.

F.M. Field-marshal.

Fo. folio.

F.B.A.S. Fellow of the Royal Astronomical Society.

F.R.C.P. Fellow of the Royal Assimis Society.
F.R.C.P. Fellow of the Royal College of Physicians.
F.R.C.S. Fellow of the Royal College of Surgeons.
F.R.G.S. Fellow of the Royal Geographical Society.
F.R.S. Fellow of the Royal Society (L. London, E. Edishnens)

Edinburgh).

F.R.S.A. Fellow of the Royal Society of Arts.
F.S.A. Fellow of the Society of Antiquaries.
F.S.S. Fellow of the Statistical Society.

G.C.B. (Knight) Grand Cross of the Bath. G.C.H. (Knight) Grand Cross of Hanover. G.C.M.G. (Knight) Grand Cross of St. Michael and

St. George.

Gr. Greek.

H.E.I.C.S. Honourable East-India Company's service.

H.M.S. Her Majesty's service or ship. H.R.H. His or Her Royal Highness. Ib. or Ibid. (Ibidem). In the same place. Id. (Idem). The same. i.e. (Idest). That is.

I.H.S. (Jesus Hominum Salvator). Jesus the Saviour of men.

#### Abbreviation

I.H.S. (with a cross over the II) (Inhdo [Cruce] Salus). In this (Cross) salvation.
Incog. (Incognito). Unknown.
Inst. (Instante). Instant, of the present month.
J.C. (Juris Consultus). Jurisconsult.
J.P. Justice of the Peace.
J.V.D. (Juris utriusque Doctor). Doctor of Civil and Canon Law.

K.B. Knight of the Bath.
K.C.B. Knight Commander of the Bath.
K.C.H. Knight Commander of the Order of Hanover,
K.C.M.G. Knight Commander of St. Michael and St.

George, K.G. Knight of the Garter.

K.H. Knight of Hanover.

K.M. Knight of Malta.

R.M., Knight of Matts,
K.P. Knight of St. Patrick,
K.T. Knight of the Thistle,
Lb. (Libra). Pound,
L.C.J. Lord Chief Justice,
L.D. Lady Day,
LL.B. (Legum Baccalaureus). Bachelor of Laws.
L.J. D. (Legum Doctor). Tooton of Laws.

L.B. (Legum Dectry). Doctor of Laws.
L.B. (C.S. Licentiate of the Royal College of Surgeons.
L.S. (Locum sigill). The place of the seal.
L.S.A. Licentiate of the Society of Apothecaries.
L.S.D. (Libra, Solidi, Denaris). Pounds, shillings

pence.
M. (Mille). A thousand.
M.A. or A.M. (Artium Magister). Master of Arts.
M.D. (Medicina Doctor). Doctor of Medicine.
M.B. (Messicurs). Gentlemen.
M.P. Member of Parliament.
M.R.C.S. Member of the Royal College of Surgeons.
M.R.I.A. Member of the Royal Irish Academy.
M.S. Managonit.—MSS Managoripts.

MS. Manuscript.—MSS. Manuscripts.
Mus.D. (Musice Doctor). Doctor of Music.
M.W.S. Member of the Wernerian Society.

N. North; noon; note.
N.B. (Nota bene). Mark well; observe.
N.B. (Nota bene). Mark well; observe.
Nem. con. (Nemine contradicente). Nobody contradicting; unanimously.

Nem. diss. (Nemine dissidente). Nobody dissenting.

N.P. Notary Public.
N.S. New Style.
8vo. Octavo.
O.S. Old Style.

Oxon. (Oxoniensis). Of Oxford.

oz. Ounce.

P. President, Professor, &c.

p. Page.—pp. Pages.
P.C. Privy Councillor.
P.C.S. Principal Clerk of Session.

Per ann. (Per annum). By the year.
Per cent. (Per centum). By the hundred.
Ph.D. (Philosophie Doctor). Doctor of Philosophy.
P.M. (Post meridiem). After noon.
P.P. Parish Priest.

Pro tem. (Pro tempore). For the time. Prox. (Proximo). In the next (month). P.S. (Post scriptum). Written after; postscript.

Ato. Questio.
Q. Querto.
Q. Query, or Question.
Q.C. Queen's Counsel.
Q.d. (Quesi dictum). As if it were said.
Q.E.D. (Quod crat demonstrandum). Which was to be

demonstrated. Q.E.F. (Quod erat faciendum). Which was to be

done.

done.

Q.S. (Quarter.
Q.S. (Quantum sufficit). Enough.
q.v. (Qwod vide). Which see.
R. (Rex or Regina). King or Queen.
R.A. Royal Academician, Royal Artillery.
R.E. Royal Engineers.
Reg. Prof. Regius Professor.
Rev. Reverend.
R.M. Royal Marines.
R.N. Royal Marines.
R.N. Royal Navy.
Rp. or B (Recipe). Take.
R.S.A. Royal Scottish Academician.
Rt. Hon. Right Honourable.

Rt. Hon. Right Honourable. R.W.M. Right Worshipful Master. S. South; saint; seconds.

Sc. (Scilicet). Namely.

S.L. Solicitor at Law S.M. (Sa Majesté). His or Her Majesty. S.P.Q.R. (Senatus Populusque Romanus). The Senate

and People of Rome.

and People of Rome.

Sq. (Sequens). The following; plural, Sqq.

S.B.O. Solicitor before the Supreme Courts.

S.T.P. (Sancta Theologia Professor). Professor of Theology.

T.O.D. Trinity College, Dublin.

Ult. (Utkimo). In the last (month).

U.P. United Presbyterian.

U.S. United States, United Service.

V.C. Victoria Cross.

V.D. M. (Vanhum Dei Minister). Prescher of God's

V.D.M. (Verbum Dei Minister). Preacher of God's Word.

Viz. (Videlicet). To wit; namely. W.S. Writer to the Signet.

Xmas. Christmas. Xtian. Christian.

& (et). And. &c. (et catera). And so forth.

ABDICATION, üb-de-kai'-shun (Lat. abdice, I renounce, reject, refuse), in general signifies the renouncing or reject, rentsey, in general as signines one renouncing or giving up of any trust before the usual or stated time of holding it is expired; but it is commonly applied to the renouncing of regal power. It differs from resignation in that the latter is done in favour of some one, whereas the former is done anconditionally. Abdications occur most frequently in absolute governments, as we find among the Roman emperors, the sultans of Turkey, and the cars of Russia. By the English constitution the sovereign cannot abdicate except with the consent of the two houses of parliament. It has been held, however (as in the case of James II., 1698), that the sovereign may, by acting subversively of the constitu-tion, be regarded as having abdicated. In early times the most noted abdications were those of Sylla, the dictator (B.C. 79), and Diocletian, the emperor (A.D. 305). In more recent times we have the emperor Charles V. In more recent times we have the emperor Charles V. (1556); Christina of Sweden (1654); Philip V. of Spain (1724); Victor Amadeus II. of Sardinia (1730); Charles IV. of Spain (1808); Napoleon (1818); Victor Emmanuel V. of Sardinia (1821); Charles X. of France (1830); William I. of Holland (1840); Louis Philippe of France (1848); Louis Charles of Bavaria (1848); Ferdinand of Austria (1848); Charles Albert of Sardinia (1849). dinia (1849).

ABDOMEN, db-do'-men (Lat.abdo, I hide), in Anat., the belly, or lower part of the trunk, separated from the chest crupper part by the disphragm. It contains the stomach, intestines, liver, spleen, pancreas, kidneys, &c., stomach, intostines, liver, spieen, pancreas, sinueys, ac., and is lined within by a membrane called the peritoneum. For convenience of description, the abdomen is divided horizontally into three regions,—the upper, or epigastric; the middle, or umbilical; and the lower, or hypogastric. It may also be divided longitudinally by two lines, when the above terms are confined to the central portion, the epigastric having on each side the right and left bypochondriac, the umbilical, the right and left lumbar, and the hypogastric the right and left iliac.
Abdomen, in Ent., signifies the whole lower portion of
the body of an insect, united to the corselet, or thorax, by a thread.

ABDOMINALES, OF ABDOMINAL FISHES, ab-dom-i-nai'. ABDOMINALES, or ABDOMINAL FISHES, ac-aom:-nas-less, the fourth class of animals in the Linuman system. Charac. Ventral fins (those of the belly) placed behind the pectoral (those of the breast), in the abdo-men, and the branchize or gills ossiculated. The ar-rangement of Linumus is now, however, generally iiscarded, the term abdominales denoting a family or subdivision of malacopterygious or soft-finned fishes only.

ABDUCTION, ub-duk'-shun (Lat. ab, from, and duco, ADDUCTION, ib-duk'-shun (lat. ab, from, and duco, I draw), in Law, is the illegal carrying off of the person of another, whether of child, heiress, wife, or woman in general. If a wife be taken off, either forcibly or by fraud and persuasion, the husband may obtain damages for her abduction, and likewise from any person persuading or enticing his wife to live apart from him without sufficient cause. In the case of an abduction of ward, the guardian may recover damages from such
as take his ward from his keeping; but when the ward
comes of age, the guardian must account to the ward
for the damages received. If an heiress be taken away
for the damages received. If an heiress be taken away
for the purpose of either marriage or defilement, the

for life, with the heirs of D as inheritors, the inheritance

act becomes a felony, and the principal, or his aiders, abettors, or counsellors, may be punished by transportation for life, or not less than seven years. The abduction of a girl under 16 is a misdemeanour, the punishment of which is fine or imprisonment, sad if a marriage shall have been brought about by violence, it may be set aside on that ground. To carry eff and marry any womane by force is a felony, and in such a case, as well as in that of the abduction of an heiress, the rule that a wife may not be allowed to give evidence against her husband does not hold good, for these reasons,—that the prime ingredient in the marriage contract, the wife's consent, has been wanting, and likewise because it is an axiom of law, that "s man shall not take advantage of his own wrong." which would clearly be the case were a man, by forcibly marrying a woman, allowed thereby to prevent sier appearing as a witness against him. Sir Walter Scott, in his Notes and Introduction to Rob Roy, informs us that the crime of abduction was at one time an ordinary offence on the border of the Scottish highlands. dinary offence on the border of the Scottish highlands. (See Kidnapping.)

Anduction, in Logic, is a form of reasoning called by the Greeks apagoge, in which the greater extreme is contained in the medium; but the medium is not so evidently in the lesser extreme. Ex. Whatever God has revealed is certainly true: now God has revealed a future retribution; therefore a future retribution is certainly true. In the use of this kind of reasoning, the minor proposition must be proved to be contained

the minor proposition in us of proven to be constituted in the major, otherwise the reasoning is inconclusive. ABDUCTOE MUSCLES, ib-duk'-tor, a term given in Anatomy to those muscles which draw one part of the body from another; as adductor muscles are those which draw one part of the body to another.

ABBLE-TREE, ib-ee'-le, in Bot. called the Populus alba, a species of the popular, having very large leaves. ABELMESAK, a-bel-me'-sak, the musk-seed, which is grows in the West Indies and in Egypt, and which is used as a perfume.

used as a perfume.

ABERDEVINE, cb-er-de-vine, a song-bird, sometimes called the Siskin. It is the Carduelis spinus of Cuvier, and resembles the green variety of the canarybird, with which it is often paired, to produce what are called mule birds. In its habits it is migratory, breeding in the north of Europe, and visiting Germany, France, and Britain, only in the autumn and winter.

ABERGATION, cb-er-ai-shun (Lat. cb, from, and erro, I wander), a term applied to three highly-important optical plenomens:—1. Abergation of Light, in Astronomy, designates a small apparent displacement of the fixed stars. It arises from these combined causes,—the progressive movement of light (travelling at the rate of 195,000 miles per second), and the movement of the earth in her orbit. Its effect is to give the fixed stars an apparent movement in space around their of the earth in her orbit. Its effect is to give the fixed stars an apparent movement in space around their true place. The discovery of this remarkable fact was made in 1727, by the illustrious English astronomer Dr. Bradley; and it is one that affords aft incontrovertible proof of the motion of the earth around the sun.—2. Aberration of Sphericity designates that deviation of the rays of light which takes place after they have passed through a curved lens, whereby the rays, instead of being collected into a single point, are extended over a small space; thus giving a rather confused image of the object. This deviation is due to the apherical form of the lens itself.—3. Aberration of the frangibility is the term applied to that dispersion of the rays of light which happens after they have passed through a lenticular glass, and in consequence of which a variegated ring of colour is seen encircling the image, and thereby rendering it a confused one. the image, and thereby rendering it a confused one. This defect has, however, been remedied by the in-

ADECTOR AS DOWNER, DEED TEMPORADE OF UNDERSON WHICH ADDRESS OF SELECTION ADDRESS OF SELECTION ADDRESS OF SELECTION AS A DESCRIPTION OF A DESCRIPTION AS A DESCRIPTION OF A DESCR is treated as a principal; if absent, as an accessary before the fact.

#### Abies

remains in abevance until the demise of D, as it is impossible that there can be an heir to a living person.

A peerage is held to be in abeyance when the next inheritors are several females.

Adules, at bi-see (Lat. abies, the fir-tree), in Bot., a nus of plants included in the natural order Conifera, or cone-bearing family. Several species of this genus are valuable timber-trees; as Abies excelsa, the spruce are valuable theoreties; as Loves Livesus, the spince fir; A. alba, the white sprace; and A. canadensis, the hemlock sprace. The resins and gum-resins which these trees exude are extensively used in the arts. The sprace fir produces common frankineense, from which spruce ar produces common frankineense, from which Burgundy pitch is prepared; the balm of Gilead fir (A. balsamea) yields Canada balsam; the silver fir (A picea), Strasburg turpentine; and the common larch (A Larix), Venice turpentine. Essence of apruce, used in the preparation of spruce beer, is formed by boiling the shoots of A. nigra, and some other species, in water, and afterwards conventioning the description. in water, and afterwards concentrating the decoction.

ABIETINE ai-bi'-e-tine (Lat. abietarius, connected with firs), the neutral resin obtained from Strasburg turpentine and Canada balsam. It is insoluble in water, soluble in alcohol. Its chemical formula is not

ABIETINEE. (See CONIFERE.)

ABJURATION, OATH OF, &b-ju-rai'-shun (Lat. ab, from, and juro, I swear), a form of oath originally imposed by statute 13 William III., and regulated by 6 George III., by which the juror acknowledged the right of the present royal family of Eugland to the right of the present royal family of England to the crown, under the Act of Settlement. He who took this oath further promised to support the monarch to the utmost of his power; engaged to disclose all plots against him; and declared that the descendants of the Pretender, or son of James II., had no right to the crown of England. The oaths of abjuration were generally required to be taken at the same time with the oaths of allegiance and supremacy; but all these oaths have now been reduced to a single formula of a much simpler character than they formerly possessed.

ABJURATION OF THE REALM, in Law, means the taking of an oath, by which the juror engages to retaking or an oath, by which the jurof engages to re-nounce and quit the realm for ever. Popish recusants, or those who refused to acknowledge the supremacy of the king of England as head of the Church, were in former times constantly being called upon to take the eath of abjuration of the realm; but by the statute 31 George III., made in 1791, the Roman Catholics were relieved from this as well as other penal restrictions .-Abjuration signifies, likewise, a public and solemn recantation of opinion. The "abjuration of heresy" was an act frequently required by the Roman Catholic church. History affords several examples of this act. Henry IV. abjured the Protestant religion on ascending the throne of France, in 1593; the queen of Sweden abjured her religious opinions in 1655; Turenne in 1688; and Augustus II. of Poland in 1706. Galileo was obliged to abjure his philosophical opinions by the Inquisition in 1633.

ABLATIVE, ab'-la-tiv (Lat. ablatus, taken away), the and given to the sixth case of nouns in Latin; so called from its implying "taking from," or "carrying away." The ablative absolute is applied to a noun occurring with a participle, independent of any other part of the sentence, and hence put in the ablative.

Any new Many course it has been controlled in the control

ABLUENT MEDICINES, ab-loo'-ent (Lat. abluo, I wash away), a term formerly applied to those medicines which are used for purifying the blood.

ARLUTION, db-lu'-shun (Lat. abluo, I wash away),

ARLUTION, do-tut-skun (Lat. actua, 1 wasu away), signifies, in a general sense, the washing or cleansing by water. The washing of the body, as being a fit emblem of purification, as well, doubtless, as from its importance in a sanitary point of view, came to form a more or less important part in almost every form of religious worship. It was enjoined in the Jewish and the construction of the sanitary point of the sanitary and t economy, and we find our Saviour repeatedly censuring the excess to which it was carried by the Pharisees. In Mohammedanism and the religious of India ab-

In Mohammeanism and the religions of India ac-lution occupies a very important place.

Annormal, id-nor-mid (Lat. ab, from, and norma, a rule), in Bot., a term applied to serial roots, like those of the mangrove, which help to support the stem.

ABOARD, id-bord', in Mar., signifies within the vessel.

Also, when a ship gets foul of another, she is said to be "aboard" of her.

#### Abridgment

ABOLITION, db-o-liek'-un, in parliamentary language, signifies the repealing some statute or usage.

ABOLITION OF BLAYERY. (See SLAYBEY.)
ABOLIA, d-bol-la (Lat. abolla, a closk or garment without sleeves), the name of a loose woollen closk worn by the Greeks and Romans. It was a smaller garment without sleeves) and some state of the state worn by the creeks and homans. It was a smaller gar-ment than the togs (see Tosa), and very closely resem-bled the pallium (see Pallium). It was festened under the throat, or upon the shoulder, by a fibula or clasp. ABOMA, 4-bo ma, a species of large serpent, inha-biting the morasses of South America. It will be found described under Boa.

ABOMIVE, a-bor'-tiv (Lat. abortio, untimely birth). In Bot, the essential part of the stamen is the auther, and when this is absent the stamen is said to be abortive. The general term abortion is applied to the suppression or new development of any organ.

ABOU-HANNE, a-boo' han'-nes, an African bird, considered by some naturalists to be identical with the ancient ibis. Although solitary in its habits, it is sometimes seen in small bands of from six to ten, and is capable of a lofty and powerful flight. It has some resemblance to the curiew found in Britain, but has resemblance to the curiew found in Finance, but men to been observed to run. In Egypt it is called by the inhabitants Abou-Menzel, which literally signifies "Father Sickle-bill," from the curved resemblance which it bears to that implement. The Ethiopie name, which it bears to that implement. The Ethiopic name, however, is Abou-Hannes, which means "Father John," and which, according to M. Dumont, is supposititiously applied to it because it arrives in Ethiopia about the day of St. John. The ibis, although so much associated with Egypt, does not breed in that country, but arrives as the waters of the Nile begin to rise, and disappears when these subside.

Abour, &-bour, in nautical language. signifies the

ABOUT, about, in nautical language, signifies the alteration of a ship's course. In military language, "about" means a change in the position of a body of troops. "Right about" and "left about" are commands given to execute semicircular turns to the right or the left.

ABBACADABBA, ab-ra-ka-dab'-ra, the name of an Assyrian god, which was formerly believed to have the power of curing diseases, especially slow and intermit-tent fevers. To accomplish this, the word was to be written many times in the form of a magical triangle,

> ABRACADABRA ABRACADABR ABRACADAB ABRACADA ABRACADA ABRACA ABRAC ABRA ABR A B

In modern times the term is for the most part used only in jest, without any particular meaning, like hocus-

ABBAMIS, a-brai'-mis (Gr. abramis), a sub-genus of malacopterygious or soft-finned abdominales, of which the bream is a species.

the bream is a species.

ABKANCHIANS, d-rbdn-'-ks-ans (Gr. a, without, and branchia, gills), an ord. of Anellidians, so called because they possess no organs of respiration.

ABKANSAS, d-brdz'-as, a term used by the Gnostics, a philosophical sect, who, in the early ages of Christianity, endeavoured to reconcile the doctrines of Paganism with those of Christianity. It signifies the Supreme Being, under whom they placed 365 dependent delities

ABRAKAS, a genus of nocturnal Lepidoptera, in which is included the common magpie-moth. Its colour is a yellowish white clotted with black, and a band of pale orange marks the wings. It deposits its eggs on the leaves of the ourrant and gooseberry in July or August, and the caterpillars are hatched in September. Its chrysalis is black.

brysalis is black.

ABREAST, a-brest (Ang.-Sax.), in maritime language, denotes the situation of two ships when they lie parallel to each other. Ships are spoken of as being "abreast" of a place when they are directly opposite

ABBIDGMENT, a-bridj'-ment (Fr. abrégement), in Lit.

much the same thing as an epitome or compendium of a large work. The excellence of an abridgment lies in taking only what is material and substantial, and rejecting what is superfluous either in sentiment or style. In Law, it is the shortening of a count or declaration.

ABROMA, 3b-ro-ma, in Bot., a genus of tropical plants in the Byttneriacea, or Chocolate order.

ABROY, 3b-rupt (Lat. abrumpo, I break off), in Bot., a term applied to any main root which ends

Bot., a term applied to any main root which cause abruptly, as though the point had been bitten off.

Arrey, of both (Gr. obros, elegant), in Bot., a genus of leguminous plants. The seeds of the Abrule precatorius are used as beade for making rosaries and necklaces: they are of a bright scarlet colour, with a black

mark on one side.

ABSCESS, ab'-sess (Lat. abscedo, I separate), the ABSCESS, difference (Lat. absecto, I separate), the name given in Surg., to an accumulation of pus, or matter, in some tissue or organ of the human body. The pus is formed from the blood during the process of inflammation, and the production of it is termed suppuration. When an opening is formed in an abscess, and matter still continues to be discharged from it, it is styled an ulcer. There are few tissues or organs of the body in which abscesses may not form. Abscesses in some organs are comparatively uninvortant. scesses in some organs are comparatively unimportant; in others they are highly dangerous.

ABSURS, or ABSURSA, äb-sus'-a (Lat. abscindo, I cut off), in Geom., a term signifying a segment cut off from a right line by an ordinate to a curve.

ABSCISSION, ab-siz'-shun, in Rhet., a figure of speech by which the orator breaks off suddenly, in the middle of a sentence, or of his discourse, to make the deeper impression on his audience.

Absentee, db-sen-tee', in Polit. Econ., is a term applied to a person who derives his income from one country, but who resides and expends it in another. Whether the absence of a landlord be injurious to a country in an economical sense is a question which has been much debated of late years, more particularly in connection with Ireland. Some maintain that the amount which a landlord spends in a foreign country is so much clear loss to the country from which he derives his income, and so much encouragement withdrawn from its industry. Others, again, assert, that, in point of fact, the revenue spent by a landlord in a foreign country has precisely the same effect upon the industry of his own country as if it were expended at home. They argue, that an Irish landlord residing in Paris receives his remittances of rent in bills of exchange which represent the value of British goods imported into France; that the money, instead of being with-drawn from the country, is expended in the production of Irish goods suitable to the English or foreign narket; and that thus a wider field of industry is developed for our native productions. The truth seems to lie between the two. Though it is not true that the whole revenuespentout of acountry is so much clear loss to that country, yet there can be little doubt that it has a prejudicial effect. The profits of the foreign retailers, servants, and others, remain at least in the foreign country, and are so much sharacted from the absen-tee's country. But there is a higher point of view in which this subject is to be regarded; namely, the moral. The evils here are undeniable. It is the duty of the proprietor to regard the interests of his tenants, to set before them a good example, and to sid them in effect-ing local improvements.—Ref. McCulloch's Treatise on Reonomical Policy.

Absintains, & d.-sin' thene (Gr. a without, and psin-thes, pleasure), & crystalline principle obtained from the Artemisia Absinthium, or wormwood, an herb used in the preparation of absinthe and other liqueurs.

(See ARTEMISTA.)

ABSIS, or AFSIS, ab'-sis (Gr. apsis, an arch), in Arch., a term used by the ancient ecclesiastical writers to denote that part of a sacred edifice where ar was erected, or where the clergy took their It was thus called on account of its having the altar was erected, generally a domed or vaulted roof.

generally a comed or valued roor.

ABSOLUTE, The, the so-lute (Lat. absolutus, adequate, that needs no addition), in Metaphysics, is a term employed to indicate that which exists without limitation of any kind. Another term, of the same meaning, is the Unconditional. The Absolute

Absorption

stands opposed to the Relative or Conditional. lute truths are truths which are necessary and universal, such as the axioms of mathematical science, and, in the estimation of certain schools of thought, the first principles of theology and morals. It is chiefly in Germany that the belief in such absolute truths exists. The English mind has always leaned in a contrary direction; and the greater number of English metaphysicians have believed in the relative or conditional nature of all truth whatsoever. Many thinkers, however, of the first order, have endcavoured to seek a Universal Postulate, i.e., a truth so self-evident as to require no illustration, the latest effort of the kind in this country being that of Mr. Herbert Spencer, in his treatise on "Psychology."

ABSOLUTIES, ABSOLUTIES, in Pol., a form of government in which the supreme head or sovereign is above

the control of the law, and enjoys unrestricted power.

(See DESPOTISM.)

ABSOLUTE NUMBER, is the known quantity which possesses one side of an equation; thus, in  $x^2 + 12x = 24$ , the absolute number is 24, which is equal to the

square of x added to 12x.

Ansolution, &bso-lu'-shun (Lat. ab, from, and solvo, I loose), in Civil Law, is an acquittal or seutence of a judge declaring the accused innocent of the crime laid to his charge. In Canon Law, it is a remission of laid to his charge. In Canon Law, it is a remission of sins pronounced by a priest in favour of a penitent. It is said that down to the 12th century the formula of absolution was, "May God," or "May Christ absolve thee," when it was changed into "I absolve thee from thy sin," the priest thus assuming to himself the thy sin," the priest thus assuming to himself the power to forgive sins. This is still the doctrine of the Roman Catholic church, sanctioned by the council of Trent, and grounded on John xx. 23. The form that occurs in the Church of England Order for the Visitation of the Sight of Theolic that form all the prime. tion of the Sick, "I absolve thee from all thy sins," is held to be only declaratory of the sinver's pardon upon the apparent evidences of a sincere repentance, and according to the best judgment of the priest. In the early church there were held to be five kinds of absolution,—sacramental, by haptism and by the eucharist; declaratory, by word of mouth and doctrine; precatory, by imposition of hands and prayer; judicial, by relaxation of church censures

relaxation of charch censures.

ABSORDERTS, db-sorb'-cats (Lat. absorbeo, I suck up),
a name given in Anat. to certain small delicate vessels which imbibe fluids that come in contact with
them, and carry them into the blood. They are denominated lacteals or lymphatics, according to the liquids which they convey.

ABSORDERTS, in Med., substances used to absorb or neutralize the acids sometimes formed in the stomach: chalk and magnesia are examples. In Surg., spongy substances used in dressing wounds, such as lint and

ABSORBENT GROUND, a term given in Paint. to a water-colour mixture, which is laid upon the canvas or wood, and, which, upon the oil-colours being applied, at once imbibes the oil, leaving the colours in which the design is made dry and brilliant.

ABSORPION, db-sorp'-shun, is the interpenetration of certain bodies by other bodies or influences, which

by this means disappear or become lost. There are several important examples of this in Physics.

several important examples of this in Physics.

Ansorption, in Bot., the chief function of the root, by which food is taken up in a state of solution for the uses of the plant. (Sce Endonnose.)

Ansorption, in Chem., the disappearance of a gaseous fluid on entering into combination with a liquid or solid; thus, when the gas, ammonia, is passed into water, absorption takes place, and the result is the liquid commonly called spirits of hartshorn.

Ansorption, in Physiol., a term employed to designate that natural function of the body which is exercised by the absorbent vessels; as the absorption of the chyle by the lacteal vessels.

ADSORPTION OF HEAT is where the heat-rays seem to disappear within the substances of bodies subjected to their influence, the effects differing greatly according to surface and colour. As this subject is closely connected with the phenomens of radiation and reflection, it will be considered at greater length under the ABSORPTION OF LIGHT will be best explained by

#### Abstinence

considering the causes of transparency, opacity, and colour. Transparency in a body is caused by one part of the light striking on it being transmitted through its substance, another being reflected from its surface, and a third being absorbed or lost is its interior. When a body reflects the whole of the light, it is said to be opaque, in which case, however, a small portion is absorbed. Colour is produced in transparent media by part of the colour contained in white light being absorbed. For example, a piece of blue glass absorbs the ned and yellow ravs. and transmits the blue: a absorbed. For example, a pace of blue glass absorbs the ned and yellow rays, and transmits the blue; a piece of orange glass acting just in a contrary manner, transmitting the red and yellow rays and absorbing the blue. The same thing happens with opaque-coloured bodies, with the exception that the unabsorbed ray is reflected instead of being transmitted. In a white opaque object, nearly the whole of the white lightis reflected from its surface, a small portion being absorbed without any separation of the coloured rays absorbed without any separation of the coloured rays In a black opaque object nearly the whole of the white light is absorbed without suffering any change. No light is absorbed without suffering any change. No object is absolutely transparent or opaque, even air absorbing a small portion of light and colour, and gold and silver transmitting green and purple rays respectively, when procured in sufficiently thin films. Ferfect absorption or reflection is also unknown, for the darkest substance reflects a little light,—otherwise it would be invisible; and the brightest speculum metal absorbs as infinitesimal portion. Philosophers are as absorbs an infinitesimal portion. Philosophers are as yet in ignorance of the causes of absorption of light; several theories have been propounded, but they appear only to make the matter still more difficult of comprehension.

ABSTIMENCE, ab'-sti-nense (Lat. abstineo, I abstain), the act or habit of refraining from something to which we have a propensity, or in which we find pleasure; but it is more particularly applied to the privation or sparing use of food. Abstinence has been enjoined and practised for various ends, as sanstory, moral, or religious. Physicians relate wonderful cures effected by abstinence; moralists, as the Pythagoreans, Stoics, and others, recommend it as a means of bringing the animal part of our nature into greater subservience to the spiritual; and it is likewise enjoined by various religious sects. It was commanded to the Jews; and, when among the primitive Christians a dispute arose upon this subject, the apostle Paul gave his opinion of the Romans xiv. 1—3. In England, abstinence from flesh on certain days has been enjoined even since the Reformation, and was renewed under Elizabeth; but Neiormation, and was renewed under Engapeth; but it was then expressly declared to be a political law, to favour the consumption of fish, and to multiply the number of fishermen and mariners.— Ref. English Cyclopædia—"Arts and Sciences." •

ABSTRACT MATHEMATICS, Or PUES MATHEMATICS, bit-stract (Lat. abstralo, I withdraw), signifies that branch of the science which deals with magnitude, force of the science which deals with magnitude, force of the science which deals with magnitude,

figure, and quantity in general, and without reference to any particular magnitude, figure, or quantity, Abstract Mathematics is opposed to Mixed Mathematics, which deals with the application of mathematics

ABSTRACT NUMBERS, in Arith, a term which signifies numbers considered in themselves, and without being applied to any individual thing,—as 4, 8, 12, &c.,—in distinction from numbers applied, or in the

concrete,—as 4 men, 8 feet, 12 ships, &c.

ABSTRACTION, ab-strak'-shun, in Psychol, this name is given to that operation of the mind by which it takes so given to that operation of the mind by which it takes cognisance of qualities separately from the thing in which they exist; as, for example, of whiteness, apart from snow, from lime, from milk, or from any other substance or liquid. "An abstraction" is the idea which substance or liquid. "An abstraction "is the idea winon is the result of the above process;—an abstract idea, which, however fugitive in itself, speedily clings to a word, and becomes incorporate with it. The question whether abstract ideas, such as Beauty, Truth, Time, Space, have any real existence, or are only forms of things and wholly relative, is, and always has been, the great bone of metaphysical contention. It was the point in dispute between the Realists and Nominalists of the Middla Assa and still divides thinkers into two crosses.

#### Acalepha

thing asserted, by demonstrating that the contrary is impossible, or leads to an absurdity. It is much used

impossible, or leads to an absurdity. It is much used in geometry.

ABUNDANT NUMBERS, &-bun'-dant (Lat. ab from, and unda, a wave), in Arith., are those numbers the aliquot parts of which, added together, make more than the number itself: thus, the aliquot parts of 20 (1, 2, 4, 5, 10), on being added together, make 22.

ABUTILON, ā-bu-te-lon, a genus of plants, belonging to the natural order Malvacea. The most interesting species is the Abutilon esculentum, commonly called Bençao de Deos, the flowers of which are boiled and eaten as vegetables in Brazil.

ABUTMENT, ā-but-ment (Fr. aboutir, to abut), in Arch., a term signifying the pier from which an arch springs, when the arch is less than a semicircle; but when an arch of any other figure is supported by but when an arch of any other figure is supported by a pier, which forms a right angle with the water or ground beneath, it is termed an impost-pier. The piers of Waterloo and London bridges are impost-piers; those of Southwark and Vauxhall are abutments. The extremities of a bridge, resting on the sides of a river, &c., are always termed abutments.

ABUTTALS, ā-but-tals (Fr. abutter, to bound or limit), the boundaries or limits of lands. These boundaries or abuttals are, in the case of corporation and church

lands, preserved by an annual procession.

Anyss, a-biss' (Gr. busses, profound depth), a term
the decident of the session of able; and in a figurative sense, it implies hell, or the bottomless pit.

ABYSSIMIAN CHURCH, in Eccl. Hist., the name of a sect of the Christian church established in Abyssimia. It is said, that about the beginning of the 4th century of our era, Meropius, a learned Greek of Tyre, when on a voyage of discovery, had landed on the coast of Abyssinia. Here he was attacked by the natives, and himself and crew murdered, with the exception of two youths, Framentius and Eddssius. These rose into great favour and influence in the country, and Frumentius was subsequently made bishop of Auxumas (the chief city of Abyssinia) by Athanasius, and laboured with great success. At present, the forms and ritual of the Abyssinian church are a strange compound of Judaism and Christianity, of ignorance and superstition. It is governed by a bishop, who is styled abona, and is sent into Abyssinia by the Coptic bishop of Alexandria. The Abyssinians have, at different times, expressed a desire to be reconciled to the church of Rome.

to be reconciled to the court of Rome.

ACACIA, "k-ka'-\*-k--\*, in Bot., a genus of plants, belonging to the natural order Leguminosa, sub-order Mimosa. Many kinds furnish good timber and valuable gums. The Acacia vera yields gum arabic; and the inner wood of the A. Calcehu, an Indian shrub, affords a bird of acacha was match, which is tarnism which is

inner wood of the A. Catechu, an Indian shrub, attords a kind of catechu, or cutch, rich in tannin, which is used for tanning, and, in medicine, as an astringent.

ACADEMY, & & Lad' - e-me, was the name of a place in the suburbs of Athens, laid out in walks and shady trees, and said to have been so called after its possessor, Academus or Ecademus. It became a favourite resort of the lovers of meditation and philosophy, and hither Socrates was wont occasionally to repair, to converse with his disciples. But it is chiefly in connection with Plato and his philosophy that the place has become famous; and hence his followers were termed Academics. In modern times, the term "academy" has come to have a somewhat different signification from that which it bore in angient times. It is generally applied to a society of learned men, formed for the cultivation of science, literature, or the arts. ACADEMY FIGURE, in Paint, a term used to signify a design, generally executed with black and white chalk, after a living model.

ACALEMENT A. Academy of the control of the control

ACALEPHE, a-ka-le'-fe (Gr. akalephe, a nettle), a class of marine invertebrate animals, comprehended in the sub-kingdom Radiata, and otherwise called Seanettles. It embraces an extensive number of animals, of which the genus Medusa of Linnsons may be taken Middle Ages, and still divides thinkers into two great as the type. This genus has a nervous system and schools. (See Prisonification.) Absurbum, Reduction AD, the still divides the truth of the a mode of argument which proves the truth of the

rated into four families,-the Pulmograda, the Ciliograda, the Cirrhigrada, and the Physograda. These families exhibit a great variety of genera of peculiar structure and form. Some of them are extremely beautiful, and present an interesting study to the naturalist. (See Jelly Fish and Medusa.)

the Acan ACANTHACER, a-kan-thai'-se-e, in Bot., thus order. Herbs or shrubs found in most parts of the world, and abounding in the tropics. Many species have very beautiful flowers. The elegant lobed and sinuated leaves of the acanthus are stated to have singgested the capital of the Corinthian pillar. (See CAPITAL.)

ACANTHION, a-kan'-the-on, in Zool., a genus of Rodentia known, at present, only by their osteology.
The genus was established by Cuvier.

The genus was established by Cuvier.

ACARTHODERMA, ā-kān-tho-der'-ma, a fossil genus of fishes, from Glaris.

ACANTHODES, ā-kān-tho'-dees (Gr. akuntha, a point; odons, a tooth), a genus of fossil-Ganoid fishes, found in carboniferous strata, near Edinburgh, Scotland.

ACANTHOPHIS, ā-kān'-tho-fis, in Zool., a genus of venomous serpents, allied to the vipers. From these, however, they are distinguished by their having a single series of plates beneath the tail. excent towards the series of plates beneath the tail, except towards the very end of it, where, in some instances, these are separated in two small rows. They are viviparous, and conceal themselves among the roots of trees, depending for their prey on the effects of the poison with which they are imbued.

ACANTHOPTERYGII, ŭ-kŭn-thof-te-ry/-ge-i, one of the three natural orders or primary divisions of fishes, divided by Cuvier into fifteen natural families.

divided by Cuvier into fifteen natural families.

ACANTEURUS, d-kăn'-thu-rus, in Nat. Hist., a genus of fishes, of the order Thoracici. Charac. Teeth small, in most species lobated; tail aculeated on each side. It is a native of the Indian and Arabian seas, in the latter of which it is generally seen in large shoals of two or three hundred each, swimming with great strength, and feeding principally on different kinds of sea-weed. The genus contains a large number of species, many of which are extremely beautiful both in form and colour.

number of species, many or which are the string both in form and colour.

ACANTHUS, &-kin'-thus, in Bot., a genus of herbaceous plants, belonging to the order Acanthacea (which see). Most of the species are tropical, but two grow These are Acanthus molis,

ocous planes, but of the species are tropical, but wild in Central Europe. These are Acanthus mollis, wild in Central Europe. These are Acanthus mollis, which has emollient qualities, and A. spicatus.

ACARUS, did-d-vas (Gr. akari, a mite), the tick or mite, a genus of insects of the order of Aptera, or those without wings. It is oviparous, has eight legs, and two jointed tentacula. It will live many tabes without wings. It is oviparous, has eight legs, two eyes, and two jointed tentacula. It will live many months without food, and is very prolific. Of the species, there are, the domestic mite, the iteh mite, the sugar-mite, the red spider, the sparrow-mite, the water-mite, and the ticks.

ACATALECTIC, a kāt-a-lek-tik, a term applied in Ancient Poetry to such verses as have all their feet and

sellables without any defect at the end; those which are not so, being called catalectic.

ACALLESCENT, ā-kawi-cs-sent (Gr. a, without, and kaulos, a stem), in Bot., a term applied to plants having very short or inconspicuous stems, as the sweet violet

ACCALIA, &k-kai'-le-a, festivals held among the Romans in honour of Acca Laurentia, the nurse of Romulus.

ACCREBATION, äk-sel-le-rai'-shun (Lat. acceleratio, hastening), in Mech., is when the velocity of a moving body is continually increased. With whatever velocity a faling body mores in the first second, it will, at the end of two seconds, move with twice that velocity, and so on; the force of gravity increasing as the body spproaches the earth. This is, however, not mathe-matically true, as it it is it is lost through the in-creased density and consequent resistance of the air at

ACCELERATION OF THE STARS, a term applied in Ancient Astron. to the time by which the fixed stars anticipate the diurnal motion of the earth.

ACCELERATION OF THE MOON is the increase of the moon's mean motion from the sun, compared with the diurnal motion of the earth, which is calculated at about ten seconds in a century.

ACCELERATION AND RETARDATION OF THE TIDES

are certain irregularities in the difference between the times of high water, which difference would be constant supposing the tides occurred at regular intervals. The tides are caused by the attraction exercised by the sun and moon on the waters of the earth. The earth being nearer to the moon than to the sun, it is by her The earth that the greatest influence is produced. The moon takes 24 h. 50 m. to perform one revolution round the earth; high water ought, therefore, to strive at exact intervals of 12 h. 25 m. This interval is, how-The moon . ever, continually changing at different times and places, being influenced by three principal causes, the relative distance of the sun and moon, of the earth and moon, and the moon's distance from the equator and moon, and the moon's distance from the equator. Local circumstances, such as currents, prevailing winds, &c., are other causes of these irregularities. For instance, high water takes place at Ipswich at nearly the correct time; at Glasgow and Greenock too early; and at most other places too late. The proper recurrence of spring and neap tides is at the conjunction and opposition of the sun, and is also irregular. At London the highest spring tide occurs 2 days 10 hours after the proper time; this error itself being liable to the greatest irregular.

irregularity.

ACCENT, ak'-sent (Lat. ad, to, and cano, I sing), among grammarians, is the raising or lowering of the voice in pronouncing certain syllables of words. There are three kinds of accents; viz., the acute, the grave, and circumflex. The acute accent, marked thus ('), shows that the voice is to be raised in pronouncing the syllables over which it is placed. The grave accent is marked thus ('), and points out when the voice ought to be lowered. The circumflex accent is compounded to be lowered. The circumflex accent is compounded of the other two, and marked thus (') or ('); it denotes a quavering of the voice between high and low. Some call the long and short quantities of syllables, accents;

ACCENT, in Music, signifies a raising of the tone, in order to obtain variety and expression.

(See BILL OF Ex-ACCEPTANCE, ak-sept'ans. CHANGE.)

CHANGE.)

ACCESSARY, or ACCESSORY, ik'-ses-so-re, or ik-ses'so-re (Lat. accedo, I approach), in Law, signifies one
who is guilty of a felonious offence, not principally,
but by participation. There are two kinds of accessories,—"before the fact" and "after the fact." An
accessory "before the fact" is he who, "being yet absent
at the time of the crime committed, doth yet procure, counsel, or command another to commit a crime." An accessory "after the fact" is one who receives, assists, or relieves a felon of whose guilt he has knowledge. (See LAW, CRIMINAL.)

ACCESSARY, Or ACCESSORY (Fr. accessoire), a term used in Paint., to eignify those things introduced into a picture for the purpose of explaining and helping the principal objects in telling the story. The works of Hogarth furnish excellent examples of the advantages to be derived from the employing of accessaries.

ACCESSION, dk-sex-shun (Lat. accessor, going to or towards), in International Law, signifies the act of a power when it becomes party to a treaty concluded between other powers. It also means the period at which a prince assumes the sovereignty. In Med., it

is synonymous with paroxysm.

Accidens, äk\*-se-dense (Lat. accidens, falling), a small book containing the first principles or rudiments

of grammar.

ACCIDENT, dk'-se-dant (Lat. accident, falling), notes, in a general sense, any casual event. Among logicians, it signifies,—1. Whatever does not essentially belong to a thing; 2. Such properties in any subject as are not essential to it; 3. In opposition to substance, all qualities whatever are called accidents; as sweetness, softness, hardness, &c. In Grammar, accident implies a property attached to a word without entering into its essential definition.

ACCIDENT, is that which does not follow from the nature of a thing, but from some qualities of it. It also signifies qualities as opposed to substances. In Heraldry, it is in coat-armour an additional mark, which may be omitted without effecting any change in the dignity. In Gram., it is something belonging to a word, but not essential to it; as gender, number, inflection.

ACCIDENTAL, ak-se-den'-tal (Lat. accidentalis, hap-

#### Accipenser

pening by chance), in the language of philosophy, is employed to express the effect which proceeds from the cause happening by accident.—Accidental colours are those which depend on the affections of the eye. The term is applied to the ocular spectrum which is generally term is applied to the ocular spectrum which is generally breceived after the eye has been for softe time steadily fixed upon a coloured object. Thus, if we look for some time upon a yellow piece of cloth, and suddenly turn the eye from it, we will see the colour of indigo; red will give a bluish green, and so on. These colours are also called complementary colours, because, when taken in conjunction with those of the spectrum, they make up all the colours of a white light.—Accidental point, in Perspective, that point in the horizontal line where the projections of parallel lines meet the perective plane.

ACTIPENSER, lk-se-pen'-ser (Lat. acipenser, a sturgeon), in lehth., a genus of fishes, of the order of Amphibia nantes. It has a single linear nostril; the month is in the under part of the head, and without teeth; the cirri are below the snout, and before the mouth. There are three species of this genus. I. Accipenser Huso, the largest, is a native of Eussia. The skin is so atom, as to be used for trace in dewing schilds. strong as to be used for traces in drawing vehicles. The isingless of the shops is made from its sounds and Scales.—2. Accipenser Enthenns is also a native of Russia.

—3. Accipenser Sturio, or the sturgeon, is frequent in our rivers. Isinglass is also made of the sounds of this our rivers. Isinglass is also made of the sounds of the length of 18 feet, and weighing 700 lbs. It is oviparous, and spawns in water. (See STURIONIDE.)

ACCIPITEES, dk-sip-e-trees (Lat. accipiter, a hawk), an order of birds, having a crooked beak and powerful the states. In this cades are alsead the vulture falcons.

talons. In this order are classed the vulture, falcons, hawks, and owls.

ACCLAMATION, ill-la-mai'-shun (Lat. ucclamatio), smong the ancient Romans, a shouting in concert, expressive of their public approbation of the conduct of their princes or generals. The acclamations of the theatres, at first rude and tumultuous shouts, became, in process of time, a species of regular concert. When Nero played in the theatre, a signal was given, upon which 5,000 soldiers began to chant his praises, which the spectators were obliged to repeat. the term is applied to those medals on which the people

are represented as expressing their joy.

ACCLIMATIZE, čk-kli-ma-tize (Lat. ad, to, and clima, a climate), to accustom an animal or plant to a climate not natural to it. A change of climate induces a certain change in the constitution of the individual, greater or less, according to the amount of difference between the two climates. In cases where the difference is extreme, diseases and even death may be the result. The change produced by acclimation may be either an improvement or a deterioration. Some plants or animals possess the power of bearing changes of climate to a much greater extent than others; and, frequently, a change which cannot be effected in one individual, may be brought about more gradually in the course of a few generations. The power of bearing changes of climate is remrkable in the human species, parti-cularly in the Anglo-Saxon race. An attention to dis-culating, &c., does much in modifying the influences of climate

ACCOLADE, ak-o'-lade (Lat. ad, to, and collum, the ACCOLADE, ik-o'-lade (Lat. ad, to, and cotum, the neck), a term used to express an ancient mode of conferring knighthood, by the sovereign embracing the neck of the new-made knight. In England, it is generally considered as the slight blow given on the shoulder or cheek when the honour of knighthood is being conferred. Gibbon calls this blow "the emblem of the last affront which it was lawful for him to endure." Some antiquaries derive the origin of this custom from the blow given to the Roman slave by his master when giving him his freedom. giving him his freedom.

ACCOMMODATION BILL, dk-kom'-mo-da'-shun (Lat. ad, to, and commodum, convenience), in Commerce, signifies a bill of exchange accepted by an individual for the convenience of the drawer, with whom it rests to take it up when at maturity.

ACCOMPANIMENT, dis-kimi-pan-s-ment (Fr. accompanyer), in Music, denotes the instruments which, in the subordinate part or parts, accompany the voice, either to give it fulness or relief, and to heighten the general effect. Thus, the plane and the moving body has been constantly accelerated.

#### Accumulation

guitar are suitable instruments for the accompaniment of a song. In concerto, the instrument for which the principal part is composed is accompanied by the whole

principal partis composed is accompanied.

Accompaniment, in Her., denotes anything added to a shield by way of ornament, as the belt, mantling, supporters, &c. Accompaniment is about of or several bearings about a principal one, as a saltier, bend, fess, &c.

Accompanied in Law, signifies an agreement

Accob, dk-kord', in Law, signifies an agreement entered into, whereby one party consents to receive from another something in satisfaction of a debt, or in

row of small elastic springs, or laminæ, fixed in a merow of small elastic springs, or laming, fixed in a metallic plate at one end, in such a manner as to allow them to vibrate freely. A bellows, or folding apparatus, unites the upper and lower parts, and supplies the springs with the necessary air to put them in motion. To these the air is admitted by valves, which, in the same manner as in an organ, are acted on by the keys. A base note, or drone, is also added. The compass of the most perfect instrument is from G, the fourth space on the base cleff, to E, the seventh additional space above the treble, all the semitones inclusive. Previous to the introduction of the principle of this instrument to Europe, it was well known to the The soft tones of the accordion have a Chinese. The soit tones of the accounts have a great effect upon savage nations, as asserted by Roman Catholic missionaries, who carry with them accordions to attract the people to their discourses.—The Figure 1 and the savage of accordion and there is an accordion and there is an accordion and there is an accordion and there is a few accordions are according to the savage and the savage according to the savage and the savage according to the sav TINA is another species of accordion, and there is an ORGAN-ACCORDION recently invented.

ACCOUNT, or ACCOMPT, &k-kount', in general de-notes all arithmetical computations. Among merchants it is used for the books in which their business is entered. (See BOOK-KEEPING.)

ACCOUNTANT, &-bount-tant, a person skilled in mer-cantile accounts. Accountants are usually employed in investigating the accounts of traders, making up states of affairs, collecting accounts, &c. The official in a public office who has charge of the accounts is termed public office who has charge of the accounts is termed an accountant.—Accountant in Bankruptcy is an officer appointed by the logd-chancellor, having the control and management of the funds belonging to bankrupt estates.—Accountant-General, an officer in the court of Chancery, appointed for securing the moneys and effects of the suitors.

ACCOUNTS, CHAMBER OF, in the old French government, was a court similar to the Exchequer of England.

England.

ACCOUNTS STATED, a title given to the common count in the declaration in an action, where, upon a balanced account between the parties, the plaintiff seeks to recover the amount due.

ACCOUTERMENTS, &k-koo'-tre-ments (Fr. accoutre-ment), a term signifying, in military affairs, the dress,

equipage, &c. of a soldier.

ACCERSCENT, äk-res'-sent, in Bot, a term applied to a persistent calyx, that continues to grow after the flowering, so as to form a sort of bladder round the

rout, as in the winter cherry.

ACCEOCHÉ, ak-ro'-shai, in Her., denotes a thing being hooked into another.

ACCUATION, dk-ku-bai'-shun, a term used to express

the posture taken by the ancient Greeks and Romans at their tables. This posture exhibited their bodies extended upon couches, with their heads resting on pillows, or on their clbows, supported by pillows.

ACCUMBANT, ük-kum-bent (Lat. accumbere, to lie

down), in Bot., a term applied to cotyledons which are applied to each other by their faces, and have the radicle folded on their edges, as seen in the embryo of

the wallflower. (See EMBENG).

ACCUMULATION OF DEGREES, &k-ku-mu-lai-shun
(Lat. camulus, a heap), in a university, is the taking of
two or more together, or with small intervals between

#### Accusative Case

ACCUSATIVE CASE, ak-ku'-sa-tiv, in Grammar, the fourth case, governed by an active verb or preposi-tion; as, I love him; where him is the accusative of the pronoun &, and is governed by the verb Love. It more peouliarly belongs to the Latin language, but has been introduced to the English, in which it survives only in pronouns. It comes after all prepositions, and is usually termed the objective case. (See GRAMMAR.)

ACE, aise (Lat. as, a unit), in games, signifies that side of the dice whereon one is marked. In cards, it denotes those which hear only one figure; as, for example, the "ace of hearts," which displays but one

heart.

ACEPHALOUS, ACEPHALA, d-sef-d-lus (Gr. arephalos, headless), in Zool., a class of molluscous animals which have no apparent head.

ACER, ut'ser (Lat.), in Bot., an important genus of thenatural order Aceracea. Many useful and ornamental trees are included in this genus.—Acer sacokarium, the sugar-maple, yields a great portion of the sugar used in America. Perforations are made in the trunk at the commencement of suring and the saccharine as the commencement of spring, and the saccharine sap which exudes is collected and boiled down to the crystallizing point.—A. campestre and A. pseudo-pluta-nus are common timber-trees in Britain: the latter, commonly known as the sycamore, furnishes excellent wood for making charcoal,

ACERACEE, ai-ser-ai'-se-e, in Bot., the Maple order The plants of this order are handsome trees, which furnish light and beautiful wood, much used in the arts. They are also remarkable for their saccharine

arts. They are also remarkable for their saccharine sap. They grow in the temperate regions of Europe, Asis, and North America. (See Acer.)

ACERANS, ACRIA, ā-ser'-rans (Gr. a, without, and keras, a horn), in Ent., a family of apterous insects.

ACERIC ACID, ā-ser'-ick (Lat. acer, the maple), in Chem., an acid obtained from the sap of the maple-

ACEROSE, as'-e-rose, in Bot., a term signifying needle-shaped, applied to leaves that are very narrow and sharply pointed, as those of the common juniper.

ACERIA, a-ser'-ra, a term applied by the ancients to a kind of altar placed near the bed of a dead person. Incense and other perfumes were consumed on it by fire

previous to the funeral, and Acerra were the pots in which the incense was burnt.

ACETABULUM, d-se-tab'-u-lum (Lat. a small cup or dish), signifies, in Zool., the suckers of the arms of the cuttle-fish, as well as other dibrauchiate cephalopods, which have on this account been termed aceta-bulifera.

ACKTABULUM, in Anat., is the term applied to that deep cup-like cavity of the os innominatum which receives the head of the femur, or thigh-bone, thus forming the hip-joint.

ACETABULUM, in Ent., is a term signifying the cavity

in the trunk in which the leg is fitted.

ACETAL, ds'-e-lal, in Chem., a thin colourless fluid, boiling at 221° F., its specific gravity being '821. It is one of the products of the slow oxidation of alcohol vapour under the influence of flucty-divided

ACETABIOUS PLANTS, &-se-fair'-e-us (Lat. acetaria, a

AGETARIOUS LLANTS, a-so-tor-e-ac l.m. acceara, a salad), plants such as endive, mustard-and-cress, lettuce, &c., used for salads.

ACETATE, d'-so-toif, in Chera., a compound formed by the union of a base with acetic acid. Many of the acetates are of great importance in the arts. These will be found under their respective bases.

acetates are soluble in water.

ACETIC ACID, ä-set'-ik, in Chem., is produced by the ACTIO ACID, "eser-ex, in Unema, is produced by the oxidation or destructive distillation of organic bodies containing its elements,—carbon, hydrogen, and oxygen. When pure, it is a colourless liquid of specific gravity 1:064, which crystallizes at a temperature below 60° F. It has a pungent smell, and is highly corrosive. Vinegar and pyroligneous acid are impure varieties of acetic acid. All liquids susceptible of the vinous formentation are capable of yielding vinegar. Of these, the most important is wine, which becomes vinegar by spontaneous acidification. The old method of making the best vinegar consists in partially filling a series of casks placed in a cellar kept at the temperature of 85° F., with a mixture of wine and ready-made vinegar.
The latter, which acts as a ferment, is first put into the

#### Achillea

empty casks, and then a certain proportion of wine. After some days, more wine is introduced, and successive additions are made periodically. When the whole has become vinegar, a quantity equal to that of the wine employed is drawn off, and the process is recommenced. In England, an inferior sort of vinegar is made from an infusion of malt by first exciting in it the alcoholic fermentation, and subsequently inducing the oxidation of the alcohol. The fermented wort is sometimes transformed into vinegar by a process precisely similar to that described above, and sometimes by allowing it to remain for several months in half-filled and loosely-stopped casks, arranged in rows in an onen field. a The German, or quick-vinegar process, After some days, more wine is introduced, and succesan open field. The German, or quick-rinegar process, consists in passing the fermented liquor through a large vessel filled with beechwood shavings moistened with vinegar. In percolating through the apparatus, which is called the generator, the liquor passes over an immense surface expessed to the oxidizing influence of the air, and is rapidly converted into vinegar. The crude acetic acid, known as pyroligneous acid, is one of the liquid products of the destructive distillation of wood. Oak and beech are the woods most commonly used in the manufacture, and the distillation is generally conducted in large iron cylinders. By a beautiful but tedious process, the acetic soid contained in the impure product is made to unite with sode, so as to form pure acetate of sode. This salt, when distilled with concentrated sulphuric acid, yields a colourless liquid, which is acetic acid. A portion of this crystallizes at a temperature of from 40° to 50° F., constituting what is called glacial acetic acid. The chemical composition of acetic acid is represented by the symbol C. H.O... Its uses are numerous and important. In the Arts, it Its uses are numerous and important. In the Arts, it is employed for the preparation of the various acctates, especially those of iron and alumina, which are the chief mordants of the calico-printer, for dissolving gums in making varnishes, and for photographic purposes. In Medicine, it is used externally as a local critical, and internally as a febriluge.—Ref. English Cyclopædio—"Arts and Sciences."

Cyclopadia—"Arts and Sciences."
ACETONE, desc-tone', in Chem., a colourless volatile fluid. having the composition CaHeO2, obtained by the distillation of the acetates of the alkaline earths. It has a peculiar odour, and is very inflammable. It is sometimes called pyroacetic spirit. As a remedy for asthma, it is occasionally used in medicine. In a pure state, it is a colourless mobile fluid which boils at 133° F.

ACHENTUM, a.ks.-me.um, in Bot., a one-seeded fruit, having a dry shell, or pericarp, which is closely applied to the seed, though separable from it. This pericarp is indehiscont, that is to say, it remains closed, and the seed can only become free by its decay. Linneus mistook achemia for seeds, and called the plants producing them gymnosperms (naked-seeded). Several achemia are formed by a single flower. The little hard bodies scattered over the surface of the strawberry, and those we find clustered together in the centre of the butteroup, are schemia. ACHENIUM, d-ke'-ne-um, in Bot., a one-seeded fruit, achænia.

ACHATMA, &-kat-ma, in Zool., a genus of terrestrial

gastropods.

ACHEBONTIA, a-ke-ron'-she-a, a genus of Lepidopte-ACHERONTIA, d-ke-ron'-she-d, a genus of Lepidopterous insects, fam. Sphingida, which embraces some of the largest European Lepidoptera, the most remarkable of which is the Acheronia atropos, or Death's-bead Hawk-moth (which see).

ACHIEVEMENT, d-tsheev'-mest (Fr. achever, to accomplish), in Her., is a term applicable to the shield of symonial hashing conceptly as the hereldic symptomic properties of the shield of symonial hashing conceptly as the hereldic symptomic properties.

of armorial bearings generally, as the heraldic symbols or badges depicted on it were originally the marks of some heroic act or great achievement of the bearer. The term, however, is commonly applied to the funeral achievement of a deceased person, affixed against the dwelling-house, to denote the death, rauk, and station of the late occupant.—Ref. Berry's Encyclopædia Heraldica.

ACHILIRA, a-kil'-le-a, in Bot., a genus of plants belonging to the natural order Composita. The Ackil-lea Millefolium, commonly called the Yarrow, or Mil-foil, is the most important British species. Its white, orrose-coloured flowers, adorn many of our meadows, particularly those with silicious soils, from June to September. From these flowers, which are occasionally

#### Achilles, Tendon

substituted for hops in browing, an essential oil is obtained, and an infusion of the leaves and flowering heads is said to be a valuable stomachic. The pretty garden plant known as white bachelor's buttons is a

garden plant known as white bachelor's buttons is a cuitivated variety of a species of achilles. The generic name is derived from Achilles, who is said to have discovered the medicinal properties of the militoil white studying botany under Chiron.

ACHILLES, TENDON, d-kill-less fort-don (Lat. tendo Achillis), in Anat., a tendon which someous the soleus and guatrocuemius muscles of the calf of the leg with the bone of the heel. It takes its name from the fable of the mother of Achilles dipping kim in the river Styx to render him invulnerable. During this concention she held him by the heel and here be suboperation she held him by the heel, and here he sub-sequently received his death-wound.

ACRILLEUM, & kill-le-um, a genus of fossil Spongia-da, of which there are two species found in the creta-

ceous strate of England.

ceous strate of Engiano.

ACHLAMYNEOUS, & lela-mi'-de-us (Gr. a, without; chiamus, a cloak), in Hot., a term applied to flowers which have only stamens and pistils, the floral envelopes being wanting. The naked flower of the common ash is an example. This consists merely of the essen tial organs of reproduction, and has neither calyx nor corolla

ACHERS, d'Aras, in Bot, a genus of plants, belonging to the order Supetaces, or Supposition family. They are natives of the tropical parts of India, Africa, and America. Several species yield luscions fruits; thus, the Achrus supeta produces the supposition of the superior are manufacturable. The barks of certain species are used medicinally in the barks of certain species are used medicinally in the treatment of fevers, and the milky juices of others yield substances resembling gutta-percha.

ACHROMATIC, dk'-ro-mai-tik (Gr. a, without, and chroma, colour), in Opt., a term applied to lesses which give images free from coloured and indistinct class.

edges. Hall and Dolland discovered the mode of constructing these lenses, by perfectly independent investigations. They both found that the chromatic dispersion which common lenses produced could be done away ses of different kinds of glas with by using two len with by using two lenses of different kinds of glass, joined together. (See Light, Lens, Puiss, Chromatics, Raffaction, Offics.)
ACICILAR, Ankland, or in Bot., a term signifying needle-shaped, applied to narrow leaves, like those of the fir. The term Maser is more commonly used, and

is to be preferred.

ACIDASPIS, de-sid-de'-pie, a genus of fossil Crustacea, of the group Trilobites, found in the Wenlook limestone.

ACIDIFIABLE, A-sid'-e-ft-a-bl, in Chem., is applied to that which is capable of being converted into an acid. Such substances are also termed radicals, and acidifiable bases.

acidifable bases.

ACIDIMETER, Mase-dim'-me-ter, in Chem., an instrument for ascertaining the strength of acids.

ACIDIMETER, Asse-dim'-me-tre, in Chem., an expeditious method of ascertaining the quantity of free acid contained in any given liquid, based upon the law of definite proportions. It is employed as a means of determining the actual or intrinsic value of the crude acids met with in commerce: To facilitate this process, tables have been constructed by Dr. Ure and others. (See VOLUMETRIC ANALYSIS.)

ACIDS, Ma'-sid (Ict. acidss. Sour), a numerous and

and others. (See Volumeric Analysis.)
ACIDS, in'sid (Lat. acidise, sour), a numerous and portant class of chemical bodies, which are distinguished by the property of combining with bases to form salts. (See Basu and Salts.) They are generally sour to the taste; in most instances they have a great affinity for water, and are soluble in it; they regdem nearly all the vegetable blues; they unite with metals or their oxides, alkalies, and earths. It was long held that oxygen was contained in all the soids. This element does indeed enter into the composition of the greatest number; but it has been according that in very many cases the acidifying principle is hydrogen. It has consequently been considered necessary to divide acids into composite, formed by oxygen, and hydracids, formed by hydrogen. These, again, are to divide acids into expectes, formed by expect, and hydracids, formed by hydrogen. These, again, are subdivided into anhydrous acids, ar solds without water, and hydrated acids, or solds containing water. According, however, to the latest researches of chemists, all acids are hydracids. The solds furnished by the

#### Aconitine

mineral kingdom are termed mineral ucids. Wetallic acids are formed by the combination of oxygen and a metal; and organic acids are those which centain carbon, or are formed with organic substances. In the system of chemical nomenclature proposed by the comment French chemists Guyton de Morvau and Lavoisier, the mineral acids are designated by an adjective formed out of the name of their elements, and termination or are not the three subsystems of the subsys Lavoisier, the mineral acids are designated by an adjective formed out of the name of their elements, and terminating in one or is; thus, sulphurous acid, phosphoris acid, implying that the first is formed of sulphur and expen, and the second of phosphorus and expen. If the acid be formed of hydrogen, the term is commenced with hydro; thus, hydrochloric acid signifies that the compound contains hydrogen and chlorials. The two syllables one and is affired to the names of acid compounds, indicate two different modifications; is always denoting an acid which contains more crygen than the acid whose name terminates in one; for example, sulphuric soid has for its acidifying principle more crygen than sulphurous acid. It was at first though that a substance dould not form with crygen more than the two above-mentioned compounds; but cases were subsequently discovered wherein a substance was found to make with oxygen as many as five different combinations. In order to distinguish these combinations from the others, it was found necessary to employ three prefixes borrowed from the Greek; for example, hypo (under), hyper (above), or briefly per (in the highest degree). Thus hyposulphurous acid is an acid composed of sulphur and a smaller proportion of oxygen than sulphurous acid; perchloric acid contains more oxygen than chloric acid, perchloric acid contains more oxygen than chloric acid, end which all contain cashon and hydrogen, a large proportion oxygen, and some nitrogen, have no regular nomenclature. The most important of these chemical portion oxygen, and some nitrogen, have no regular nomenclature. The most important of these chemical portion oxygen, and some nitrogen, have no regular nomenciature. The most important of these chemical bodies are,—among the mineral acids, sulphuric, sulphuricas, hydrosulphuric, nitric, phosphoric, arsenious, areenic, chromic, hydrofluoric, chioric, lodic, carbonic, boracic, and silicio; among the organic acids, formic, hydrocouric, axestic, mailo, tarriaric, succinic, benzoic, citric, &c. (See these words.) Acids are extensively employed in medicine, principally in cases of inflammation, fever, palpitation of the acid, and irritation of the skin.

ACINACIPORE, &-serio-seriors (Lat. acinaces, a scimitar: forms, form), in Bot., a term signifying scimitar:

ACINACIPOUS Assence server of that decimaces, a scinitar; forman, form), in Bot., a term signifying scinitar-shaped; applied to certain succulent leaves.

ACHIVE, de-enes, in Bot., one of the divisions of the fruit of the raspberry.

ACINDES, dk-li'-dees, a missile weapon, supposed to have been a kind of dart or javelin, made use of by the

maye neen a kind of dart or javelin, made use of by the ancient Romans. According to Scaliger, it was a globular weapon, and poised by a wooden stem.

Acard, did-me (Gr. atme, a point), the top or highest point of anything. Physicians use it to express the utmost violence or orisis of a disease; and in Rhet. it denotes the highest point of pathos, to which the mind is conducted by a series of impressions gradually rising in intensity.

According to Avoncey at highests (Gr. alone a

Acology, or Acology, d-hol-o-je (Gr. akos, a remedy, and loges, a discourse), a term signifying the doctrine of remedies, or of the materia medica.

Acology, db'-o-life (Gr. akalouthos, disciple), in the Romish church, one of the inferior orders of the clergy,

whose office it is to attend upon the deacons and sub-deacons in the ministry of the altar, to light and hold nescons in the ministry of the artar, to light and hold the candles, to bear the incense, to present the prinsts with wine and water, &c. In the primitive church, the accives were in lady orders, and ranked next to the accives were in lady orders, and ranked next to the accives are very often performed by laymen and shorister-boys.

Acongre, &k-o-nite (Gr. ekonism), in Bot., the poisonous plant familiarly known as the monkshood, or

wolfshame. (See Acontoun.)

Acourte Acto, ü-kon-i-tik, in Chem., is prepared by the action of heat upon crystallized citric acid, and is found to be identical with that which occurs in the monkshood combined with lime. The salts formed by the union of this acid with different bases are termed account atom

ACONITINE, Or ACONITIA, d-kon'-c-tine, in Chem.,

#### Aconitum

a powerful vegetable alkolid, prepared from the root of the Aconitum Napellus. It is one of the most virulent of poisons, but, at the same time, a very valuable medicine. Externally applied, it produces on the kins a prickling sensation, which is followed by a poedifiar numbress. An outtment containing aconitine is offer used in cases of neuralgia. The alkaled consists of the elements carbon, hydrogen, nitrogen, and oxygen, its formula being Cestla, NO 2.

Aconieum, a-kon-a-time, in Bode, a genus of plants belonging to the matural order Reassendains, the Crowfoot or Buttercup family. Readly all the species are poisonous; but when the antenets prepared from them are used in sproper doses, their narrotic and diaphoretic effects prove highly beneficial. The flowers of many species are remarkable for their heauty, and resemble little belimets. The root of the Aconitum Perox is the principal source of the celebrated Indian poison Bish, or Bish. The monthhood, Aconitum Rapellus, is a native of Europe, and occurs in several parts poison Bibb. or Bisb. The monkshood, Acception Repellus, is a native of Europe, and occurs in several parts of this country, particularly in Herefordakire, Devokshire, and Somersetchire, and is ordivated as a garden leant for the sake of its handsome purple flowers. This species is the officinal plant of our Pharmacopous, and the preparations from the area of neuralgia, acute rheumatism, and diseases of the heart. Its active principle according (see Accomptant). The root of the A. Astrophylium is said to possess mo poisonous properties, and to have a high reputation in India as a febrifuge and antiperiodic medicine.

Acontal, &-kon-she-a (Gr. Akon, a dart), a genus of

India as a febringe and antiperiodic medicine.

ACONIA, A-kori-she-a Gr. Akon, a dart), a genus of serpents established by Ouvier, and forming a link between the true serpents and the common anakes.

Charac. Without bones; the usual lizard or serpent head; body covered with small scales only, but without the horny plates which guard its under surface in the common serpents; without poison-langs, and with cartle holite, in general of a small size and if facility. gentle habits; in general, of a small size, and it feeds on worms and insects. It is found in almost every part

of the old world.

Acons, at kern (Sax. acc, an oak, and cern, grain), in Bot., the fruit of the oak-tree. Acoras form excellent food for swine, and are said to have been used by man for food in the golden age. (See

form excellent food for swine, and are said to have been used by man for food in the golden age. (See QUERCUS.)

Aconn, in Maritime affairs, a small piece of wood placed on the top of the spindle of the matheads of ships, to keep the vane from flying off.

Aconns, ai-ka-rus (Gr. a, without, and kore, pupil of the eye), in Bot,, the sweet flag, a member of the natural order Oroniacea. This plant grows in watery places, and abounds in the rivers of Norfolk, whence the London market was formerly supplied. It blossoms during the months of May and June, and is the only truly aromatic plant growing wild in this country. The thick creeping stem or rhigome, commonly called the root, is the valuable part of the plant, it is somewhat apongy and powerfully aromatic, and has a bitterish taste. It is used by the rectifiers to improve the flavour of gia, and is also employed to give a peculiar taste and fragrance to certain kinds of beer. Perfumers make use of it in the imanufacture of hair-powder, and tanners in the preparation of peculiar sorts of leather. From the fresh chisome a volatile oil is obtained by distillation, used is making aromatic vinegar, and for secting smill. In Med., the sweet flag is cometimes used as an aromatic stimulant and a mild tonic, and many physicians speak highly of its beneficial effects in cases of after. If grows in most parts of Europe, in Asia, and in the United States; and in Othello sountries it is used for strewing the churches at great factives.

Aconnenses of the Song of Bulcanon: hence its botanical mane, Aconne Calemans.

Aconnenses the Song of Sulcanon: hence its botanical mane, Aconne Calemans.

Aconnenses of the Song of Sulcanon: hence its botanical mane, Aconne Calemans.

Aconnenses the service speaked by the reduced mane acond the service of a fine first leafy organs which make their appearance in the development of plants springing from seeds properly so called. These rudimentary organs do not arriet in sporse, which are accordingly said to be aconnels of the first leafy orga

#### Acoustics

horsetalls, pepperworts, club-mosses, mosses, liverworts, aharas, inchens, fungi, and alge.

Accessus, akso-ake, is a small rodent animal very much resembling sha agenti, but less in size. It is an inhabitant of the woods of Guians, his only the rudiments of a tail, and adhesiat signs almost, and, and inhabitant of the woods of Guians, his only the rudiments of a tail, and adhesiat signs almost, and, and other forms of Agestalls food. (See Account.)

Accounts Bures, a hor sizes (Gr. akens, I hear), is that branch of Etypine which there is not the laws which regulate the produced by saming the size or external passage of the war.

Accounting, a hor sizes (Gr. akens, I hear), is that branch of Etypine which there is also adence of sound. Sound is produced by saming the size or any other sizes in the sizes of the laws which are perceived by the organ of hearing. In giver words it is the adence of sound. Sound is produced by saming the size or any other classic body, to assume a ribratory motion. No pody can produce a sound, saless its parts be put in residuation. The string of a nusical metimizent, a tuning-forth, or the parehment head of a dram, are not sonorous unless their particles be caused to assume a state of vibration. It is likewise necessary that there should be an elastic substance, whether solid or fluid, between it and the ear, or the sound will not be appreciable. For instance, a bell rung under the exhausted receiver of an air-pump will yield coarcely any sound. Although air, from its being the medium most commonly in contact with the negative was heard across the whole extent of the water, a disfance of nine miles. With respect to its production in the air, Sir John Herschel has shown that, in round numbers, sounds of every intensity travel, at the temperature of 62° Fahr., at the rate of 1,135 feet per second, equal to 124 miles per minute, or 765 miles as hour. The velocity with which sound travels through different bodies with temperature. M. Wertheim made an elaborate varies greatly. The velocity of sound in air differs with temperature. M. Wertheim made su elaborate series of experiments upon this subject, and some of his results give the following:—

Tempere	sture of A	ir.	Velocit	y of Sound.
0.20	centigra	ie	1,0	89 feet.
2 10	39		1,0	
8.2			1,1	
120			],]	HB 19
26'0		4000	.,,,, 1,1	40 ,,

"At a temperature of half a degree above the freezing point of water the velocity is 1,086 feet a second; at a temperature of 28° d'egree it is 1,140 feet a second, or a difference of 51 feet for 26 degrees; that is to say, an augmentation of velocity of about 2 feet for every single degree centigrade."-Tyndull

Velocity of Sound in Gases.

ŧ.	Air	(r. 7)		100						1,00	2 fe	et.
ų,	Or	ger							2	1,04	Ο.	
á.	Hy	dro	ren.		27.7		14 /			1,18		
Ü	Cat	bon	c.	<b>leid</b>	18.		100			85		
	Car						33			1.10		·
Ş	Pro					OPE	n	vi.		85		
ं	Ole	fian	t G	u .	1.00	11.5	Z.S		, j	1,03		3
17	10 . 7 1.		70.77	1100		V 23.					A	

The temperature of the above-mentioned gases is taken at 0° centigrade. 

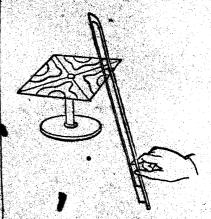
Uran	eminion of S I	ound throug comporature	h Liquide, Velocit	rija,
Sea Water	(artificial) .	20° C.	4,768	
River Wal	er ,,, .	80 .,	5,657 5,018	**
A		35 ,,	4,714	42
Sulphuric Spirits of	Corpontine		8,901 3,976	"
Solution o	frommon Sa	ic 18 .,	5,132	,, re
	Soda .	. 20 .	5,194	(in
Absolute :	Licohol f Carbonate (	. 23 ,,	8,804	"
	Soda .	23 .,	5,230	,,
	The Marie Control of the Control of	x 28	<b>6.4</b> 98	
	Marate (	f	5.477	"

The intensity of sound is much augmented if the vibrations be confined in tubes and causies of any kind. By means of a speaking-pipe, stoineds, bowers slight, may be transmitted from one part of a building to snother; whilst the stellocarde conveys to the such the sight but ominous sounds that are generated in the chest. Blot ascertained, that her singlifest sound can be heard through as you give 3, 120 feet in founds can be heard through as you give 3, 120 feet in founds from the search the sounds of the sounds are stored to comment the mountainesses to consider a search decomposition of the city of leading the sounds are different to the cit result. Sounds are different only in intensity of leadings, as the reports of a much as any of a form the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; while others, again, are different in the same instrument; the same note sounded upon a trumpet and none a furle. We have seen that sound is reduced by a occusion vibratory force being transmitted through sir, preducing what is termed a wave of sound. The same is designed to take cognizative of these pulses of force, waves, or tremors, within occusion limits. The nature of things prevents a single wave of sound from ser coming slone; the more nearly alone a wave comes, the more sharp and audden the sound is called a pulse, in the substitution laws of the same and treble clof, is produced by waves should a the sound is called a noise. When the waves of one note becars a simple ratio (1, 1, 2, 1, 1, 1, 2, 1, 3, 4, 3, or 4) to the di between a grave sind an faute sound; but it is only from attentive observation by the sys that we discover the different registity of succession is the vibrations which produce them. The vibrations of a great many though a setting, bells, and membranes, when emiting sounds, may however be distinctly seen, and even felt; but they may often be rendered more visible to the eye by a fittle artifice, such as sprinkling the vibrating body with sand, or some light granular substance. It was reserved for the celebrated Chiedni to the middle of one of the sides, upon which the sand is vibrating body with sand, or some light granular substance. It was reserved for the celebrated Chiedni to the middle of one of the sides, upon which the sand is vibrating body with sand, or some light granular substance. It was reserved for the celebrated Chiedni to the middle of one of the sides, upon which the sand is vibrations visible, and his discovery—— as an admirer of music, the elements of which I had begin to learn rather late, that is in my mineteenth year, I noticed that the science of Acoustics was more neglected than most ofther portions of physics. This excited in me to the desire to make good the defeat, and by new discovery to render some service to this part of science. In the stand is a plate of glass or metal gave discovery of an air-pump; be then exhausted it of its atmosphere sid. The bell was agitated, but gave out was according the propagated by the following experiment. The professor placed a bell in the glass vessed, not the faintest tinkle could be alsting of bells, to which one or two violis bows were fairly but though a spectator placed by applied. This suggested to me the idea of employing a violin bow to examine the vibrations of employing the violation of the six of the substance of the plate of glass fixed to me the idea of employing the corresponding modes of vibration. As this time a professor placed in the science of the six of the professor placed in the section of the six of the professor placed in the

squares of 2, 3, 4, 5, &c.; but the nature of the me-tions to which these sounds corresponded, and the means of preducing each of them at will, were yet unknown to the. The experiments on the electric figures fermed on a plate of rosin, discovered by Lich-teriors, impairment that the different vibratory motions of a suncerous plate might also present dif-ferent appearances if a little sand, or some similar substance, mans arread on the surface. On employing this means, the first figure which presented itself to my eyes, upon the shrutar place already mentioned, resembled a star with the new twelve rays, and the very soute spind in this series alleded to was that which agreed with the square of the number of diame-trical lines. These spects may be clearly shown by squares of place glass. These plates may be held by a

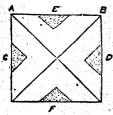


small wooden vice, or secured by a clamp in the centre, as shown in the accompanying figs. The edges of the plate must be smoothed by emery, and sand strewed upon



Acoustics.

the bell was heard. Mr. Charles Brooke, in the sixth dedition of his excellent "Manual of Natural Philosophy," states, "From a series of highly-interesting experiments on this subject by Faraday, it appears evident that while the accumulation of sand, or any other coarse and heavy powder, on the nodal lines arises from its being as it were jerked off from the vibrating pertiens, the vibrations excite currents of air over the agitated portions, which entangle any light one, as lycopodium, it will be caught up by the aerial currents, and will collect disciply on the most agitated portions of the plate, instead of on the quiescent portions, and appear animated with a curious rortex-like motion. If the plate be vibrated in highly-rarefled air, the tycopodium will be collected on the nodal lines, like the sand when vibrated in ordinary states of atmospheric pressure; and if the plate be covered with sand, and made to tibrate in a much denser medium, as water, the sand will be under the same conditions as water, the sand will be under the same conditions relatively to the medium as the lycopodium in air, and will be collected chiefly on the most agitated portions of the plate. Thus the



lines A, B, in the accompanying figure, represent the position of the sand when the plate is vibrated in sir, and of the lycopodium when in vacuo;
o and the triangles C, D,
E, F, the parts or internodal spaces where the sand is collected when the plate is vibrated in water. The vibrations of a membrane may be well exhibited by stretching a

piece of bladder over the mouth of a funnel and passing a horse-hair, retained by a knot, through its centre. By drawing the hair through the fingers, centre. By drawing the hair through the flugers, previously rubbed over with rosin, the membrane will be made to vibrate; and if sand or lycopodium be scattered on its surface, a symmetrical arrangement of the heavy particles at the nodal lines, as well as the accumulation of the light particles at the centres of vibration, may be observed. If a thin membrane be stretched on a friangular, square, or circular wooden frame, and strewed with sand, its vibrations will be readily excited by holding a tuningfork, bell, or other vibrating body, near it, and they fork, bell, or other vibrating body, near it, and they will be indicated by the motions of the particles of will be indicated by the motions of the particles of sand. From tracing-paper, or still better, thin parchment-paper (prepared by immersion in strong sulphuric acid), damped a little and attached by paste to the edges of the frame, will answer very well for these experiments."—Ref. Brooke's Natural Philosophy, 6th ed., Sir John Herschel's art on "Sound" in the Encyclopadia Metropolitans; Lectures on Sound, by John Tyndall; English Cyclopadia.

AUQUITAL, Lewit til (Fr. acquitter, to free or discharge), in Law, signifies a deliverance from a criminal charge. Thus, one who has been upon his trial for the commission of a crime, and is selivered from the charge by the verdict "not guilty" of a jary, is said to be acquitted. Should a person be indicted a second time on the same offence, he may

jury, is said to be acquitted. Should a person be in-dioted a second time on the same offence, he may always answer the charge by pleading this verdict, termed the plea of "autrefois acquit," by which he will be entitled to be set at liberty. Acquittance, it-keet'-times, in Law, a written dis-charge for a sum of money that has been paid. An acquittance in full of all demands will discharge all daths areast such a are on acquility wis secretal

debts, except such as are on specialty; viz., secured by bonds and instruments under seal. These latter

by some and instruments under seal. These latter can only be discharged by a deed.

ACER, al'-ker (Lat. ager, Gr. agree, a field), a measure of land, which, in the United Kingdom, has several values; but when used in a general sense, the English statute acre is to be understood. Its dimensions may be readiest accertained by remembering that a square with its eide of 22 yards is the tenth part of an acre. The chain with which land is measured is 22 yards long, and 10 square chains are equal to one acre, or 4,840 square yards. There are 640 acres in a square mile : thusAcrolein

Anra Roods. Perches. Square Yards. 180 4,840 1 40 1,210 301

The Irish acre is larger than the English, 100 of the former being nearly equal to 162 of the latter. The Scotch acre is also larger than the English, 48 of the former being equal to 61 of the latter. In various parts of the country there are, besides those we have mentioned, local sures; such as the Cheshire acre of 6 yards to the pole.

yards to the pole.

Achidians, Acedra, S. kriz'.-- due (Gr. skrie, a locuet), a family of orthopterous insects.

Acetris, Acetra, dekr'-tes (Gr. skrites, indiscergible), the simplest and lowest division of the saimal kingdom, which embraces the Injuscria, Rhicopolia,

ible), the suppease and the laylucoria, Rhizopella, kingdom, which embraces the laylucoria, Rhizopella, and Sponges. (See these words.)

Achorat, lik'-ro-bid (Gr. akron, an extremity, and baino, I go), a name given by the ancients to rope-dancers, vaniters, &c. Acrobats perform both upon the tight and slack rope, or upon ropes placed horizontally, perpendicularly, or obliquely, and the exercise of their craft requires great strength, agility, and foarlessness. Acrobats are frequently mentioned by the writers of ancient Roms and Greece; and many, in the present day, have, by the extraordinary nature of their performances, acquired considerable popularity. For instance, Madame Saqui, Herr Hengler, and M. Blondin, who crossed the Falls of Niagara, carrying a man upon his back, upon a single rope, stretched and fastened to the opposite shore.

Acrochordus, ük-ro-kor'-dus, a genus of serpents

ACROCHORDUS, \(\vec{u}k\)-ro-kor'-dus, a genus of serpents discovered in Java. Charac. Head flat, and with the body covered with small scales; without poisonfangs, but possessing a double row of sharp-pointed teeth; throat capable of great extension; tongue thick and short; length from 8 to 10 feet.—It has been in-ferred that this serpent is frugivorous, a point doubted by Cuvier. A specimen of this reptile, procured by Homestadt, measured eight feet three inches in length, and three inches in diameter, while the greatest breadth of the tail did not exceed half an inch. It was captured in a pepper-tree plantation by some Chinese, who, says Homestadt, cooked and ate the flesh. It was a lemale, and when cut open was found to contain fine perfectly formed serpents, each about nine inches long. In the asomach was a quantity of half-digested fruit.

digested fruit. According to the control of the con

Acotyledons (Jussieu), so named from the fact of the sesence of cotyledons amongst this class of plants. Exembryonate (Richard), designating the absence of any regular embryo in the reproductive cells or

sporces.

Cellulares (De Candolle), denoting the general absence of vascular tissue and the prevalence of cellular tissue in these plants.

Agama, of various authors, implying the absence of the necessity of the union of two cells in order to re-produce a new individual.

produce a new individual.

Cryptogamic (Linnaus), intended to convey the idea
that if two cells were necessary to the reproduction
of the new plant in this class, it was not obvious, as
in the Phesogamous plants.

The Acrogens, as equivalent to the shore expressions for the same class, embrace all those plants which
are included in the above definitions. This term is
itself, however, not only applicable literally to those
plants which, destitute of flowers, possess a stem growing in a manner distinctive from those called Exogens
and Endocens. It has been thus restricted by Lindley and Endogens. It has been thus restricted by Lindley in his "Vegetable Kingdom," and he places the stem-less floweriess plants in another class, called Thallorens.—Ref. English Cyclopedia; Butler's Manual of Botomy.

ACROLUIN, dk'-ro-less (Lat. meer, sour; oleum, oil), in Chem., a highly volatile liquid, produced by the

#### Acrolitha

action of heat on fat. Its vapour attacks the eye and the nucous membrane of the nose most distressingly. the museus memorate of the elements carbon, hydrogen, and oxygen, in the proportions expressed by the formula C. H. O. . It was first isolated and examined by M.

C. H. O.. It was tirst isolated and examined by M. Bedtenbacher, of Prague, in 1848.

ACROLITES, Mc-ro-liths (Gr. akron, extremity, and lithos, stone), in ancient Greek Sculpture, signified those attues the heads, arms, and feet of which were of stone, the trunk of the figure being of wood. Acceptable of Machine Western Combability Mellin Colombia cording to Trebellius Pollio, Calpurnia caused an acrolithan statue of Venus to be executed. There was also an acrolithan statue of Mars in the temple of that god at Halicarnassus.

that god at Halicarnssus.

ACRONYCHAL, ük-ron'-e-kal (Gr. akron, the highest poins, and nuklos, of 'night), in Astron., applied to a star when it is opposite to the sun, or passes the meridian at midnight. A star is said to rise acronychally when it rises at sunset, and to set acronychally when it sets as the sun rises. Opposed

ACROSALENIA, à-kros-à-le'-ne-à, a genus of fossil Echinadermata, occurring in the Isle of Sheppey. ACROSPIEE, àk-ros-pire' (Gr. akros, summit, speira, a spiral), in Bot., the sprout at the end of a seed which has commenced to germinate,—the plumule of modern botanists. Maltsters use this term to express the growing of the barley.

ACROSTIC, a Pros'-tik (Gr. akros, beginning, and stichos, a verse), a poetical composition, disposed in such a manner that the initial letters of each line, taken in order, form a person's name or other complete word or words. By some authorities it is held to have been invented by Pornhyring Outstand plete word or words. By some authorities it is held to have been invented by Porphyrius Optatianus in the 4th century. This kind of poetical trilling was very popular with the French poets from the time of Francis I. until Louis XIV. Among other English writers, Sir John Davies, who lived in the 16th century, amused himself in this way. He produced twenty-six pieces, called "Hymns to Astrea," each of them forming an acrostic upon the words Elizabetha Regina. The following is an example: The following is an example :-

> E ternal virgin, goddess true, L et me presume to sing to you.
> I ove, e'en great Jove, hath leisure
> 8 ometimes to hear the vulgar crew
> A nd hears them oft with pleasure.

B lessed Astrea! I in part E njoy the ble-sings you impart, T be peace, the mijk and honey, H umanity, and civil art, A richer dow'r thau money.

R ight glad am I that now I live High glad am I that how I live, E en in these days whereto you give G reat happiness and glory o I fafter you I should be born, N o doubt I should my birthday scorn, A dmiring your sweet story !

In the Old Testament there are twelve Psalms written In the Ole, restament there are tweive resums written according to this principle. Of these, the 119th Psaim is the most remarkable: it consists of twenty-two stanzas, each of which commences with a Hebrew latter, and is called by its name.—Ref. Hock's Charch Dictionary.

ACBOSTICHUM, d-kros'-te-kum, in Bot., a genus of ferns, of the Polypody sub-order. The species Huacsoro is used medicinally in Peru, and is much esteemed

for its audorific, diuretic, and febrifugal properties.

Acrotemnus, a-kro-tem'-nus, a genus of fossil
Ganoid fishes. One species is found in the chalk of Sussex.

ACECTERIA, d.kro.te'-re-a (Gr. akroterion, the ex-tremity of anything), in Arch., a term signifying the pedestals placed upon the sides and centre of pedi-ments for the reception of statues. The term is some needs of the reception of statues. The term is sometimes applied to the small intervening spaces between the pedestal and the balusters of salustrades.

Acr, dkt (Lat. ago, I act), in Pol., a term signifying any public act, such as an act of parliament, an act of great five the property of statement, and the first five for the property of statement, and the first five for the property of statement and the first five for the statement and the statement an

ang any puone act, such as an act of parliament, an act of grace for the pardon of offenders, &c.—dct, in Logic, denotes an operation of the human mind, as an act of the judgment, an act of the will.—dct, among lawyers, denotes an instrument or deed in writing, the human skin, puts out the fire, and performs the serving to prove the truth of some bargain or transpaction.—dct, in the universities, is a thesis maintained abstracting oxygen from the bodies which it affects in public by a candidate for a degree. At Oxford, the Fire is extinguished by sunlight through the diminus-

#### Actinism

time when masters and doctors complete their degrees is called the Act, which is held with great solemnity. Act, in Dram. Lit., the division or part of a play. With the arcient writers, it was held that a play should be divided into five parts or acts, neither more nor less. Following this rule, tragedies, from the Elizabethan period downward, have been divided into five parts; but at the present time this rule is considered, especially in the case of the lighter forms of dramatic literature, purely arbitrary, and some excellent dramas have had no more than three acts. As in the Greek drama the stage was never left empty from lent dramas have had no more than three acts. As in the Greek daams the stage was never left empty from the beginning to the end of a performance, there were no acts. The chorus, during the absence of other actors, kept the stage, and continued the drama by their songs, which mostly formed an essential part of it, and carried on the action in the same way as the dislogue did. In the "Samson Agonistes" of Milton may be seen the exact copy of a Greek drama, where the performance is carried on from beginning to end, without any division of acts. Among the Romans, however, theatrical representations were differently conducted. On their stage there was no chorus, and however, theatrical representations were differently conducted. On their stage there was no chorus, and the play was broken into perts, as in our own. The first products of the English dramatic genius were what were called "Mysteries" and "Moralities," which were not divided into acts. The earliest of the moralities which take the dramatic shape are dated from the commencement of the reign of Elizabeth. Down to 1574, it is believed that the scene of a "morality" never changed from the beginning to the end of the performance. performance.

ACT OF FATH (auto da fé), in Catholic countries, is a solemn day held by the Inquisition for the punishment of heretics, and the absolution of accused persons found innocent. It was always celebrated on a Sunday

found innocent. It was always celebrated on a Sunday or a boliday of the Church. (See Stitum) Act of Parliament. (See Stitum) Act of Parliament. (See Stitum) Act of Tolkration. (See Tolkration, Act of.) Act of Tolkration. (See Uniformity, Act of.) Act of Uniformity. (See Uniformity) Act of.) Act of.) Act of Uniformity. (See Uniformity) Act of.) Act of.) Act of Uniformity. (See Uniformity) Act of.) Act of.) Act of Uniformity. (See Uniformity) Act of.) Act of.) Act of Uniformity. (See Uniformity) Act of Uniformity. (See Uniformity

and the people, and therefore formed a species of Roman newspaper. The Acta continued to be published until the reign of the emperor Julian.

ACTER, at-tec-e, in Bot, a tribe of plants belonging to the Buttercup order, or Ranunculacca. They have elegant flowers and succulent fruits. The most important species is the Podophyllum peliatum, the May-apple or wild lemon of North America, which is employed in medicine. The extract has a much more powerful cathartic effect than extract of jalap. The active principle has lately been isolated, and is termed Podophyllin.

ACTINIA, at-tim's-2 (Gr. aktis, 2 ray), in Zool, 2

ACTIVIL, ak-tin'-i-ë (Gr. aktis, a ray), in Zool, a genus of Polypes. (See CGLENTERATA.) There are many British apecies, which are commonly known as sea anemones, from their resemblance to flowers. They are found on all rocky coasts, and they form the chief attraction of the marine aquarium. The body is conical attraction of the manne aquarium. The body is coincial or cylindrical, adhering to the rock by a broad disk-like base. The mouth, which is a simple opening into the internal cavity serving as a stomach, is surrounded by numerous tentacles, which are often beautifully marked. These organs are retractile, and, when not covered by water, the actinic appears as a smooth horsical-based laws is cluster sometimes of a bemispherical lump of elastic matter, sometimes of a brilliant colour. The reproductive power of these plant-like animals is very great, for when one is out across, new tentacles form in a few weeks on the lower

half, and each piece becomes a perfect creature.

ACTINISM, &k-tin-icm, the chemical principle of light.

Three distinct principles emanate from the sun,—light, beat, and actinism. Numerous examples of the effects

tion of the amount of oxygen necessary for combustion; and photographic operations are mostly effected by the reduction of oxide of silver to the metallic state, by the abstraction of its oxygen. We may have actinism without light, or vice vered. Yellow glass transmits the latter, but stops the former. Hence the photographer works in a yellow light. Dark blue glass, which transmits but little light, is quite pervious to actinism. Blue objects reflect great quantities of it, while red or yellow once reflect but little, or none. For this reason, in photographs, red or yellow materials are always too dark, while blue ones are too light. The electric and lime lights give out great quantities of actinism, from their blue tinge; and gas and candles but very little, from their yellow colour. The amount of actinism received from the sun differs considerably, seconding to the time of year, being at its maximum tion of the amount of oxygen necessary for combustion; according to the time of year, being at its maximum about the end of March, and gradually diminishing until the end of December, when it arrives at its minimum. Actinism in large quantities is necessary to the proper condition of the human system. It has been noticed that when dark rooms have been coloured with noticed that when dark rooms have been coloured with yellow paint or paper, the inhabitants of them have been nickly and delicate; as soon, however, as the colour was changed to blue, a marked difference in their state, of health took place. The germination of seedis greatly retarded by actinism; bence the maltster puts his grain into the dark, to malt or semi-germinate. For the same reason, seed is buried in the ground. As soon, however, as the young plant makes its appearance, a supply of actinism is necessary, and, by a wonderful provision of nature, this influence is at its height when young plants are beginning to show their heads above the earth. White, red, brown, and green sea-plants owe their colour to the different amounts of actinism they receive: the green, being near the sea-plants owe their colour to the different amounts of actinism they receive: the green, being near the surface, receive most; while the white, being at great depths, receive nearly none,

ACTINOCRINITES, dk-tin-c-krin-V-tees, a genus of Crinoidea, comprehending a great many species. It is found in carboniferous and Silurian strats.

ACTINOLITE, dk-tin'-o-lite, a crystallized mineral, found in masses in primary stratified rocks, and, occasionally, in trap rocks. It is of a green colour, and is a variety of horablenda

is a variety of hornblende.

ACTINOMETER, ik-tin-om'-e-ter, an instrument in-vented by Sir John Herschel, to accertain the intensity of the heat of the direct rays of the sun. It consists of a thermometer, with a large bulb filled with a dark blue fluid. This is enclosed in a box, the sides of which

of a thermometer, with a large built filled with a dark blue fluid. This is enclosed in a box, the sides of which are blackened, and the whole covered with a thick plate of glass.—Ref. Sir John, Herschel's Manual of Scientific Inquiry, and Breoke's Natural Philosophy.

ACTION, ak'-shun (Lat. ago, I act), a term used in Mech. and Phys. to imply the pressure or percussion of bodies against each other. Action and reaction are equal; i. e., the resistance of the body put in motion is equal to the force communicated to it.

ACTION, in Oratory, is the outward deportment of the speaker, or the accommodation of his countenance, voice, and gestures, to the subject of which he is treating. In Physiol, it is applied to the functions of the human body, whether vital, saimal, or natural; in Paint, and Sculp, the attitude or position of the several parts of the body, as indicative of passion, &c.; in the Mil. Art, an engagement between opposing forces: Action of the mouth" is a term applied to the function; to the several parts of the body, as indicative of passion, &c.; in the Mil. Art, an engagement between opposing forces: Action of the mouth" is a term applied to the champing of the bit of a bridle by a horse.

ACTION AT LAW, is a right of prosecuting to judgment, in a court of law, a claim for a sebt, for demanges, for sai injury sustained, or a wrong done, or to obtain possession of what, the right owner is deprived of.

Real, or, as they were formerly called, feudal actions, concerned real property only, whereby the plaintiff (salled the demandant) claimed the specific recovery of a debt or personal chattel, or satisfaction for some injury sustained, or a wrong done to this person or property. Mixed actions are those whereby a person either claims the specific recovery of a debt or personal chattel, or satisfaction for some injury sustained, or a wrong done to the other two, wherein some real property is demanded, and also personal damages for a wrong sustained. The Act of 8 & 4 in the contract of the supersonal damag

#### Acupuncture

Will. IV. c. 27, abolished real and mixed actions, except the following:—the writ of right of dower, dower, quare impedit, and ejectment, which subjects will be treated of under their respective titles. Personal actions are founded ex contracts (or on contracts), or ex delicte, or of torte or wrongs. The latter are often considered as of three kinds; viz., a nonfeasance, or the omission of some act which a man is bound to do; misfeasance, being the improper performance of some act which he may lawfully do; or malfeasurce, being the commission of some act which is unlawful. The forms of personal actions in use are the following :form of personal actions in use are the following :—
debt, covenant, detinue, trespass, trespass on the case,
and replevin; for which refer to these different titles.
They are also divided into local and transitory actions.
In the former, the trial must (except as aftergards
mentioned) take place in the county, or county of a
city or town, wherein the cause of action arose; in the
latter it may be had in any county, or county of a city
or town. A judge has the power to direct the trial to
be had in any particular place. (See Sur.)

ACTUR, &&-sig, denotes something which communicates action or motion to another, in opposition to

ACTIVE, & denotes something which communicates action or motion to another, in opposition to
passive, which receives action. Active verbs in grammar not only signify doing or acting, but are followed by nouns, to which their action passes.

ACTIVE MOLECULES. (See MOLECULES.)

ACTOR, & deleter or one who performs a part or character in a play. Among the ancient Greeks, actors were
so highly esteemed, as sometimes to be sent on embassies, and authors frequently performed in their own
plays; but at Rome, if a person became an actor, he
forfeited his right of voting as a Roman citizen. In
England, actors were at first the servants of the higher England, actors were at first the servants of the higher nobility; and, when regular theatrical companies came to be formed, they placed themselves under the pro-tection of some distinguished person. To this day, the players at the Drury-lane Theatre continue to style themselves "her Majesty's servants." Until after the

prayers at the Drury-lane Theatre continue to stylo themselves" her Majesty's servants." Until after the Restoration, the female parts in each drama were performed by men. The last celebrated performer of women's parts was Kynaston. Two great authors were also actors; viz., Shakspere and Molière.

ACTS OF THE APOSTLES, akts, the fifth in order of the books of the New Testament, and the last of those properly of an historical character. It gives a narrative of events that happened to the early church during the thirty years immediately succeeding the narrative of events that happened to the early church during the thirty years immediately succeeding the death of Christ. It does not, however, narrate the "acts of the spostles" generally, being almost exclu-sively confined to those of Peter and Paul. The author of this book was Luke, and its authenticity is

#### Acute

Acure, &-kute' (Lat. acutus, sharp), the opposite of obtuse, is a term applied to various things to denote counse, is a term applied to various things to denote sharpness. Acute angle, in Geometry, signifies an angle which is less than a right angle. Acute diseases, in Medicine, are those which are attended by violent symptoms. In Music, a tone is Acute when it is sharp or high, in respect to another tone, and as opposed to the grave. In Grammar, an acute accent is that which elected the roles. elevates the voice.

elevates the voice.

ADACTED, d-ddk'-ted, in Mil., a term signifying the stakes or piles driven into the earth by large malls shod with iron, to secure ramparts or pontoons.

ADAGIO, a-dai'-je-o (It. adagio, leisurely), in Music, a term signifying the slowest of all time, the grave only excepted. Sometimes it is repeated, thus—adagio, adagie, —to denote a still slower time.

ADAMANT, ād'-d-mant (Gr. a, not, damao, I break),

a supposed impenetrable stone; a term applied to the diamond and other bodies of extreme hardness, (See

DIAMOND.)

ADAMITES, ad-am-ites, in Eccl. Hist., a sect which arose in the 2nd century of the Christian era, and were arose in the 2nd century of the Christian era, and were so called from their pretending to the innocence of Adam at the time of his creation. They imitated his nakedness in their churches, which they called Paradise, and rejected marriage; living, or pretending to live, in continency. This sect did not last long; but it was revived, with additional absurdities, in the 12th century, by one Tandamus. About the beginning of the 15th century, these absurdities were again revived by one Picard, a native of Flanders. He propagated his views in Bohemia, whence they spread into Germany, Holland, Poland, and even into England.

Adansonia digitata, the bacbabtree, is the typical species. This is remarkable for its enormous size, and belonging to the tribe Bombacea, of the Silk-cotton order, or Sterculiacea. Adansonia digitata, the bacbabtree, is the typical species. This is remarkable for its enormous size, and for its extraordinary longevity. One specimen has been found to have a trunk nearly 100 feet in circum-One specimen has ference; and the age of this gigantic vegetable is pro-bably many thousand years. The leaf of the baobab is digitate, branched into finger-like leaflets; hence its specific name. The fruit commonly known as monkey-bread, or Ethiopian sour-gourd, is a large oval capsule, containing a starchy pulp, having a slightly acid flavour, which forms a wholesome and agreeable article of food. Mixed with water, it makes an acid drink, of food. Mixed with water, it makes an actual which is highly esteemed as a specifio in putrid and pestilential fevers, and is also employed by the Egyptian doctors in dysentery. The leaves have astringent properties; and, when dried and powdered, they form the condiment called *lalo*, which the Africans mix with their Arie food as a proposition of accessive numerical their daily food as a preventive of excessive perspira-tion. The bark is said to be febrifugal, and its fibres are used by the African tribes living in the districts where the Boabab flourishes for the manufacture of cordage and various articles of dress. Adanson first described this remarkable plant.

Anaris, a'-dap-is, in Zool., the name of a genus of fossil pachydermatous (thick-skinned) manmals, first described by M. Cuvier, who deduced its existence and anatomical conformation from three fragments of the head, which had been discovered in the gypsum-quar-

ries of Montmartre.

ADAPTER, &-dap-ter, in Chemical Manipulation, a tube, generally of glass, rather wide at one end and small at the other, used for connecting a retort or any other distilling apparatus with a receiver. The wider end admits the neck of the first vessel, and the tupering part enters the other.

ADAR, a'-dar, the twelfth month of the ecclesiastical and the sixth of the civil year of the Jews. It comprehends a portion of February and the beginning of March.

ADDA, ad'-da, the Arabic name for a small species of lizard found in Arabia, Egypt, and Nubia, wherever the smallest degree of moisture exists.

smallest degree of moisture exists.

Ander, the common viper. (See Viper.)

Anders-rongur, in Bot., the familiar name for

a tribe of ferns. (See Openoglosser.)

Addiction, ad-distrit, a term among the Romans,
applied to persons who, being unable to pay their
debts, became the slaves of their creditors.

#### Addresses

ADDICTION, id-dik'-shun, in the Roman Law, was the signment to another of goods, which goods were called bona addicta.

ADDITION, id-disk'-un, in Music, is the term applied

ADDITION, ad-aiss-tes, in music, is the term applied to a dot placed on the right side of a note, to signify that it is to be sounded half as long again.

ADDITION (Ext. addo, I give to), in Arith., signifies the putting two or more quantities together so as to form one total. It is the first of the four fundamental rules of Arith., the operation of which consists in adding together first the units, then the tens, then the hundreds, and so on; thus substituting for the original operation of adding the entire number, several simpler and easier operations. When the quantities to be added consist of several denominations which divide themselves into each other, as in the case of shillings, pence, and farthings, hundredweights, pounds, and ounces, or yards, feet, and inches, the smaller denominations are first added together, and, should their product equal or exceed the quantity of a superior denomination, it is carried to the next column of figures denoting that superior denomination. In addition of fractions, the various fractions must be first reduced to the same denominator, in order that they may represent quantities of equal value; then add together all the numerators of the fractions so reduced, together all the numerators of the tracuous so reduced, and give to their product the common denominator. In addition of algebraical quantities, they should all be written one after another, without changing any of the signs, and the terms which before had no sign, should be connected with the rest by the sign + . Thus a + signs, and the terms which becomes the sign +. Thus a+b and a-2b added, give a+b+a-2b; or the sum may be reduced to a simpler form by observing that b subtracted twice and added once, is equivalent to bsubtracted twice and added once, is equivalent to be subtracted once, and that a is added to a; the expression then becomes 2a - b.

Additions, in Law, are those designations affixed to

a person's name by way of title.—Additions of degree, are the same with titles of honour.—Additions of are the same with three of honour. — Additions of estate, such as yeomen, gentlemen, &c.—Additions of mystery or trade, are baker, mason, &c.—Additions of place or residence, are of London, Bristol, &c.

ADDESED, &d-dorsd' (Lat. ad, to, and dorsum, the back), in Her., a term used when any two animals or other things are placed back to back.

ADDRESSES OF PRESONS OF RANK OR DISTINC-

THE ROYAL FAMILY.

Superscription. — To the Queen's Most Excellent

Majesty.

Commencement. - Madam; May it please your Majesty.

Conclusion.—I remain, Madam, with the profound-est veneration, Your Majesty's most faithful subject and dutiful servant.

PRINCES OF THE BLOOD ROYAL.

The Sons and Daughters, Brothers and Sisters, Uncles and Aunts of the Sovereign.

Sup.—To His (Her) Royal Highness the Prince of Wales (Princess Helena).

Comm.—Your Royal Highness.
Con.—I remain, with the greatest respect (I have
the honour to be), Your Royal Highness's most obedient

Other branches of the Royal Family.
Sup.—To His Royal Highness the Duke of Cambridge.

Comm.

Com.—I remain, with the greatest respect, Your Royal Highness's most humble and obedient servant.

NOBILITY AND GENTRY. Duke or Duchess.

Sup.—To his Grace the Duke (her Grace the Duchess) of Cleveland.

His Grace

The Duke of Cleveland.

Comm .- My Lord Duke (Madam).

#### Addresses

Con.—I have the honour to be, My Lord Duke (Madam), Your Grace's most devoted and obedient servant.

Marquis or Marchioness.

To the Most Noble the Marquis (Marchioness) of Normanby,

Comm.—My Lord Marquis (Madam).
Con.—I have the honour to be, My Lord Marquis, Your Lordship's (Madam, Your Ladyship's) most obe dient and most humble servant. Earl or Countess.

Sup.-To to Sandwich. -To the Right Honourable the Earl (Countess)

Comm.—My Lord (Madam).

Can.—I have the honour to be, My Lord, Your Lordship's (Madam, Your Ladyship's) most obedient and very humble servant.

Viscount or Viscountees. -To the Right Honourable Lord Viscount (Lady Viscountess) Torrington. Comm. and Con. same as Earl's.

Baron or Baroness.
Sup.—To the Right Honourable Lord (Lady) Byron. Comm. and Con. same as Earl's.

YOUNGER Sons of Earls, and ALL the Sons of Viscounts and Barons.

Sup .- To the Honourable Walter Jocelyn.

Conn.—Honoured Sir.
Con.—I have the honour to be, Honoured Sir, Your most obedient and very humble servant.

Baronet and His Wife.

Sup .- To Sir William Welby, Bart. (Lady Welby).

Comm.—Sir (Madam).
Con.—I have the honour to be, Sir, Your most humble and obedient (Madam, Your Ladyship's most obedient and very humble) servant.

Knight and His Wife.

Sup .- To Sir John Ratcliffe (Lady Ratcliffe).

Comm. and Con. as preceding.

Esquire. This title is now given to every man of position and respectability; but persons entitled to superior consideration are distinguished by "&c. &c. &c.,"

added to their superscription.

The wives of Gentlemen, whea several of the same name are married, are distinguished by the Christian name of their husbands; as Mrs. John Harper, Mrs.

William Seymour.

Privy Counsellors have the title of Right Honourable which is prefixed to their name thus (the Esq. is omitted after their names):—

Sup.—To the Right Honourable William Ewart Gladstone, M.P.

Comm.—Sir.

Con.—I have the honour to be, Sir, Your most obedient very humble servant.

Archbishop.
Sup.—To His Grace the Archbishop of York.

Conm.—Your Grace.
Con.—Iremain, Your Grace's most devoted obedient

Bishop.

Sup.—To the Right Reverend the Bishop of Lincoln.
Comm.—Right Reverend Sir.
Con.—I remain, Right Reverend Sir, Your most obedient humble servant.

Doctor of Divinity.

Sup.—To the Beyerend James Williams, D.D., To the Reverend Dr. Vivian.

Comm.—Reverend Sir.
Con.—I have the honour to be, Reverend Sir, Your most obedient servant.

Dean.

-To the Very Reverend the Dean of St. Paul's; To the Very Reverend Henry Milman, D.D., Dean or, To the Vo

Comm.—Mr. Dean; or, Reverend Sir.—Con.—I have the bonour to be, Mr. Dean (or Reverend Sir), Your most obedient servant.

Archdeacon Sup.—To the Venerable Archdeacon Hale. Comm .- Reverend Sir.

Addresses Con .- I have the honour to remain, Reverend Sir, Your most obedient servant.

Clergymen.
Sup.—To the Reverend Thomas Dymoke.
Comm. and Con. same as the preceding.

\*\*\* If a Bishop or other Clergyman possess the title of Right Honourable and Honourable, it is prefixed to his Clerical title.

When Baronets and Knights have clerical titles, it is

When hardness and Magness and Right Reverend placed first.

Sup.—To the Right Honourable and Right Reverend the Lord Bishop of Bath and Wells.

Sup.—To the Right Honourable and Reverend the Lord Bishop of Carlisle.

Sup.-To the Right Honourable and Reverend Lord

Wriothesley Russell, M.A.

Sup.—To the Honourable and Reverend Baptist

Wriothesley Nocl, M.A.
Sup.—To the Reverend Sir George Prevost. Bart.,

No elerical dignitary confers title or rank on the wife of the dignitary, who is simply addressed Mistress, unless possessing a title in her own right, or through her husband, independently of his clerical rank.

JUDGES, &C.

Lord Chancellor.

Sup.—To the Right Honourable Lord Hatherley, Lord High Chancellor of Great Britain. Rolls.

Sup .- To the Right Honourable the Master of the

Chief Justice.

Sup.—To the Right Honourable Sir A. Cockburn,
Chief Justice; or, the Right Honourable Lord Chief
Justice of the Court of Queen's Bench.

To

The Rt. Hon. Sr W. Bovill,

Lord Chief Justice

of the Court of Common Pleas.

The Chief Justice of the Court of Common Pleas, and the Chief Baron of the Exchequer, are addressed in the same form, and are all styled My Lord.

The Puisne Judges, and the Barons of the Exchequer, are Knigh's; but the title of Judge being superior, they should be addressed thus:

Sup.—To the Honourable Mr. Justice Willes. Sup.—To the Honourable Baron Martin.

Serjeant. Sup .- To J. H. Parry, Esq., Serjeant-at-aw. NAVAL OFFICERS.

Admirals have the rank of their flag added to their own name and title, thus :-

own name and title, thus:—
Sup.—To the Honourable Sir Francis William
Austen, Admiral of the White.
If untitled, they are simply styled Sir.
Commodores are addressed in the same way as ad-

Captains are addressed either to "Captain John Adams, R.N.;" or if on service, "To John Adams, Esquire, Commander of H.M.S."

Lieutenants are addressed in the same way.

MILITARY OFFICERS.

All officers in the army above Lieutenants, Cornets, and Ensigns, have their military rank prefixed to their name and title.

Sup .- To General Sir George Brown. Subalterns are addressed as Esquire, with the regiment to which they belong, if on service:

MUNICIPAL OFFICERS.

Lord Mayor.

Sup.—To the Right Honourable the Lord Mayor (The Lady Mayoress) of London, York, Dublin; The Lord Provost (The Lady Procost) of Edinburgh,
Comm.—My Lord (Madam).

The Mayors of all Corporations, with the Sheriffs, Aldermen, and Recorder of London, see styled Right Worshipful; and the Aldermen and Recorder of other Corporations of the Corporation Corporations, as well as Justices of the Peace, Worchipful.

Ambassadors have Excellency prefixed to their other titles, and their accredited rank added.

taties, and their accredited rank added.

Sup.—To His Excellency Baron Brunnow, Ambassador Extraordinary and Pleuipotentiary from H.I.M.

(His Imperial Majesty) the Emperor of Russia.

Sup.—To His Excellency the Right Honourable H.

Gaprie Elliot, Her Britannic Majesty's Ambassador Extraordinary and Plenipotentiary to the Sublime Ottoman Porte.

 $T_{\alpha}$ 

His Excellency

The Right Hon. H. George Elliot, H.B.M. Ambassador Extraordinary and Plenipotentiary.

To the Sublime Ottoman Porte.

Comm.-Sir.

Con.—I have the mour to be, Sir, Your Excellency's most humble obedient servant.

The wives of Ambaseadors have also Excellency added to their other titles.

Envoys and Charges d'Affaires are generally styled

Excellencies, but by courtesy only. Consuls have only their accredited rank added to their names or titles, if they have any.

Addresses to Government Departments and Public Companies;—

Queen in Council. All applications to the Queen in Council, the Houses of Lords and Commons, &c., are by Petition, as fol-

lows, varying only the title:—

To the Queen's Most Excellent Majesty in Council,

The humble Petition of M. N., &c., showeth That your Petitioner .

Wherefore your Petitioner humbly prays that Your Majesty will be graciously pleased to

And your Petitioner, as in duty bound, will ever pray.

Lords and Commons.

To the Right Honourable the Lords Spiritual and Temporal To the Honourable the Commons) of the United Kingdom of Great Britain and Ireland, in Parliament assembled,
The humble Petition, &c.
And your Petitioner (or Petitioners) will ever

pray, &c. Treasury and Admiralty.

Sup .- To the Lords Commissioners of Her Majesty's Treasury.
Sup.—To the Lords Commissioners of the Admiralty.

Con.—I have the honour to be, my Lords.

Navy Office and Ordnance.

Sup.—To the Principal Officers and Commissioners of Her Majesty's Navy.

Sup .- To the Principal Officers of Her Majesty's Ordnance.

Comm .- Gentlemen.

Comm.—Gentlemen.
Con.—I have the honour to be, Gentlemen, &c.
Victualling and Auditing Offices.
To the Commissioners for Victualling Her Majesty's Navy.

Sup.—To the Commissioners for Auditing the Public

Sup. Accounts.

Comm. and Con. same as preceding.

Sup .- To the Commissioners of Her Majesty's Customs.

Adhesive Plaster

Excise Office. Sup.—To the Commissioners of Excise. Tax Office.

Sun .- To the Commissioners of Taxes.

Stamp Office. Sup.-To the Commissioners of Stamps. Bank of England.

Sup.—To the Governor, Deputy-Governor, and Court of Directors of the Bank of England. East-India House.

-To the Court of Directors of the United Company of Merchants of England, trading to the East Indies.

Comm. and Con. of the above same as Navy Office

and Ordnance.

ADDUCTOR MUSCLES, ad-duk'-tor (Lat. adduce, 1 draw towards), in Anat., are those muscles which draw the parts to which they are attached together. They are opposed to the abductor muscles. (See ABDUCTOR

ADELPHOUS, ä-del'-phus (Gr. adelphos, a brother), in Bot., a word used to denote the union of the filaments of the stamens in certain flowers. The number of bundles formed by the union of the filaments is indicated by a Greek numeral prefixed to the word. Thus, when all the filaments join together in a single bundle, as in the mallow, the stamens are monadelphous. When the filaments unite so as to form two bundles, the stamens are diadelphous. The formation of three bundles is expressed by the term triadelphous; and of any greater number, by polyadelphous. ADET, ā-dept' (Lat. adipiser, I obtain), in Alchemy, was the special title given to those alchemists who were

supposed to have attained the grand object of their labours, or to have discovered the transmutation of

metals, and the philosopher's stone.

ADRECTED EQUATIONS. (See AFFECTED EQUATIONS.)
ADHERENT, "id-he'-rent, in Bot., a term applied to
a calyx or perianth, the tube of which adheres more or less to the ovary, as in the flowers of theiris, gooseberry, and myrtle.

Adhesion, ad-he'-shun (Lat. adhærere, to stick to), in Phy., a term applied to the property possessed by certain fluids and solids of becoming attached to each other when brought into contact. Adhesion is frequently confounded with cohesion, which is generally taken to mean the force which keeps the particles of the same body in close union. The examples and uses of adhesion are too familiar and numerous to need mention in detail. It will be sufficient to notice those cases where it is likely to be confounded with cohesion, atmospheric pressure, or chemical affinity. If metals are dipped into mercury, an adhesion of the particles of mercury, differing in force in different metals, takes place. This is evidently the result of metals, takes place. This is evidently the result of chemical affinity, as those metals which most readily chemical sumity, as those metals which most readily form amalgams exercise the greatest attraction for the mercury, gold being at the top of the scale, and iron and cobalt at the bottom. If two pieces of lead are scroped clean and pressed together, they adhere with considerable force, from the cohesion of their particles. When two flat glass plates are pressed together, the cause of adhesion is evidently atmospheric pressure. Friction is the result of the adhesive than the state of the second property of the force existing between bodies, and is generally greatest In machinery, between those of similar constitution. grease, oil, plumbago, or French chalk, is used to lessen the grinding action of moving bodies, on account of the small amount of cohesion existing between their molecules. When parts of machinery rub against each other, they are always made of different metals, for the reason above mentioned. Iron, working in gun-metal, is generally found to produce the least amount of friction. (See Conesion, Friction.)

ADITED A. THE COLUMN OF THE CO tion, by seraping or paring, in surfaces which it is desirable to unite. This tendency of inflamed sur-faces to adhere when in contact is sometimes troublesome, as in inflammations of serous membranes.

Annesive Plaster, plaster, commonly called strapping-plaster, is used to protect raw surfaces, and

## Adiantum

for dressing outs, wounds, and ulcers. It is a gentle external stimulant, and assists the healing process. It is composed of lead-plaster (a mixture of oxide of lead and olive-oil) melted over a slow five, with powdered resin mixed with it in the proportion of six parts of lead-plaster to one part of powdered resin.

ADIANTEM, ai-di-di-tum (Gr. adianton), in Bot., the Maidenhair genus of ferns, including some sixty species, mostly tropical. Two are found in temperate regions, namely, Adiantum capillus-Veneris, the true maidenhair; and A. pedatum, the Canadian maidenhair. The former, which has obtained its name on account of the colour and extreme fineness of its stem and nerves, is found in Scotland and Wales, growing on damp rocks; and its elegant fronds make it a great favourite with collectors. Syrup of capillaire is properly prepared by adding sugar and orangeflower-water to prepared by adding sugar and orangeflower-water to an infusion of maidenhair.

ADIAPROBRIES, aid-itf's-rites (Gr. adiaphoros, in-different), a name given to Melancthon and the party of which he was the leader, because of their submission upon indifferent points to imperial edicts. The imposition, by Charles V., in 1549, of an edict called the Interim, proposing a temporary accommo-dation of the dissensions between the Protestants and Papists, till the dispute could be decided by a council. was the origin of the name. Flavius and the primitive Lutherans opposed Melancthon in the controversy. The two principal questions debated were, first, whether it was lawful to submit to the opponents of truth, even in unimportant points; and, secondly, whether, granting that it was so, the matters upon which the Interim required submission were unimportant.

whether, granting that it was so, the matters upon which the Interim required submission were unimportant. The point in the edict chiefly insisted on was the doctrine of justification by faith. Melaucthon, after the death of Luther, adopted more moderate views than the great Reformer. From this controversy other divisions sprung, and from these divisions many of the schisms among Protestants had their origin.

AD INFINITUM, in-f-ni'-tum (Int. ad, to, and infinitus, unlimited), interminable, without end.

AD INGURENDUM, in-qui-reu'-dum (Lat. to be inquired into), in Law, is a judicial writ commanding inquiry to be made of anything relating to a cause or matter depending in the queen's courts.—Ref. Reg. Judic: Cowell; Blount.

ADIPOCEER, dd'-i-po-seer (Lat. adeps, soft fat, cera, wax), a term applied by the French savans of the last century to a product of the decomposition of animal substances in moist earth or under water. It is principally margarate of animonia, and is a fatty body, somewhat resembling spermaceti. Immense masses of it were found on the removal of the bodies from the burisl-ground called la Cimetière des Innocens, at Paris, in 1786 and 1787. Several interesting experiments were made on this substance by M. Fourcroy, at the time of this discovery, the results of which he read in 1789s. Adprosed Tiesux. åd'-i-pose (Lat. adeps. soft fat), in which he read in 1789.

which he read in 1793.

Additional Tissue, add-i-pose (Lat. adeps, soft fat), in Physiol., comprises an aggregation of minute cells filled with fat, which they appropriate from the blood. This tissue serves several important purposes in the animal body; filling up interstices, forming a pad or cushion for the support of the movable parts, and assisting in the retention of heat.

ADT, &d'-it (Lat. aditus, an avenue, an entrance) in Mining, the entrance to a mine, generally driven horizontally into the side of a hill. Formerly mines were worked by vertical shafts, but now adits are

always used where practicable.

ADJECTIVE, add fak-tiv (Lat. adjectus, added to), in Gram, is the name of one of the parts of speech or classes into which grammarians have divided words. Classes into when granularisms have divided words. It is so called because it adds to, or qualifies, the meaning of the noun with which it is joined; as, a good man, a large house, a white horse. In English a noun frequently takes the place of an adjective; as, a gold

requently takes the place of an adjective; as, a gold watch, the paper duty.

ADJOURNMENT, adjurn'-ment (Lat. ad, to, and Fr. jour, a day), putting off a court of meeting to another time or place. Adjournments of parliament differ from proregations in this,—that the houses can adjourn of the court of th of themselves, but a prorogation is done only by the sovereign. (See Prorogation.)

# Adjutant

ADJUDICATION, ad-joo-de-kai-shun (Lat. ad, to, and judico, I judge), a process known to the law of Scotland. It implies the means by which real property and its accessaries are transferred to a creditor by a debtor, from a heir to a devisee, or from a vendor, who may have failed or refused to convey, to the vendee. It is also the declaration of a commissioner in bankrupitary, that a near-def has become switcht to the vendee. It is also the declaration of a commissioner as bankruptcy, that a person has become subject to the bankrupt law, and by which he adjudicates him bank-

bankrupt law, and by which we have the rupt accordingly.

Additional accordingly which (Lat. ad, to, and junctus, joined), a term used in Phil. to signify something added to another thing, between which there is no natural affinity. In the Academy of Paris, adjuncts were members attached to a particular science.

Additional additional according to the second particular science and justify the second particular science.

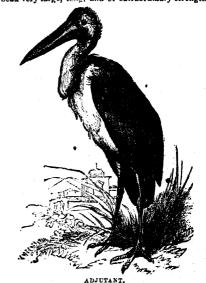
just), a term used in Marine Insurance to signify the ascertainment of the exact amount of indemnity to which the insured is entitled under the policy, when all deductions and proper allowances have been made.

Adjurage, or Ajurage, ad-ju-taj (Lat. adjuvo, I assist), in Hyd., signifies the tube of the mouth of a

jet d'eau, through which the water is conveyed.

ADJUTANT, üd-ju-tant (Lat. adjutor, an assistant), a military officer, whose duties are to assist the major in all matters relating to the ordinary routine of discipline in the regiment. The office confers no separate rank, but is usually given to one of the subaltern officers.—An ADJ.-GENERAL stands in the same relation to a general that an adjutant does to a major. and is to the army what the adjutant is to a regiment.

ADJUTANT, in Orn., a gigantic orane, belonging to the Ardeida or Heron fam. Its scientific name is Leptoptitios argula. Charac. The adjutant stands five feet high; the neck and head are almost bare; the beak very large, long, and of extraordinary strength.



Beneath the beak hangs a downy pouch like a dewisp, which the bird has the power of inflating. The upper part of the adjutant is of an asb-grey colour, the under part white. Its voracity is wonderful: it can swallow part of the adjutant is of an asb-grey colour, the unusation part white. Its voracity is wonderful: it can swallow a fowl, a rabbit, or a leg of mutton, at a mouthful; and it is extremely useful in devouring all sorts of carrion. In Calcutta it is called the Scavenger, and any person wantonly killing one is fined, 50 rupecs. In their wild state these birds live in companies. Seen near a river, and from some distance, Dr. Lathem remarks that they may "well be taken for cances upon the surface of a smooth sea. or for men and women picking up of a smooth sea, or for men and women picking up shelldsh or other things on the beach." Hab. The warmer parts of India.

# Ad Libitum

An Libitum, lib'-i-tum (Lat., at pleasure), in Music, a term signifying that the performer may introduce into the composition any addition of his own, according to his fancy.

ADMEASUREMENT, & d-mesh'-ure-ment (Lat. admensu-ratio, mensure, I mete or measure), in Law, is a writ which lies in dower. Admensuratio dotis, where a man's widow, after his death, holds more land as dower than widow, after his death, holds more land as dower than of right belongs to her, or the heir or his guardian do not assign her dower within the term of guarantine, or forty days, or assign it unfairly, the writ then goes to the sheriff to assign it. It formerly was used also in cases of pasture (admensionate posture), where those who had common of pasture appendent to their free-hold estates, or common by vicinage, and any one or more of them surcharged the common. The latter writ in abolished.—Ref. Bl. Com. vol. i. b. 2, pt. 1, ch. 4; vol. iii. b. 5, ch. 8; Reg. Orig. 156, 171; Termes de la Ley.

ADMMASUREMENT in Mar. the mossance of them.

ADMEASUREMENT, in Mar., the measurement made to ascertain the tomage of a ship.

ADMINISTRATION, and AUMINISTRATOR, dd-min'-is-trai'-shun (Lat. administratio, aid, assistance, agency). The office of an administrator is to administer or dis tribute the goods of a person who has died without making a will; or, having made a will, without ap-pointing an executor: in such cases, letters of administration are taken out of the principal or a district registry of the Court of Probate. Administration is likewise used for managing the affairs of minors, lunaties, &c. In ecclesiastical concerns, it means the temporal and spiritual powers of a beneficed clergyman. Among anatomists, it signifies the act of dissection, particularly of the muscles.

ADMINISTRATION, in Pol., denotes the persons in a state intrusted with the general superintendence of affairs and the execution of the laws. In England the

term is usually employed to designate the Privy Council, especially that portion of it known as the Ministry. ADMIRAL,  $\bar{a}d'$ -mi-ral, the title of the highest class of naval officers. The word is said to be derived from the Arabic Emir or Amir, lord or chief. In the British navy there are three kinds of admirals,—of the Red, of the White, and of the Blue; so called from the colour of their flags; whence they have all the general title of fla, officers. There are, further, three grades in each of these classes,—Admirals, who bear their flag at the main-top-gallant masthead; Vice-admirals, at the foretop-gallant masthead; and Rear-admirals, at the mizentop-gallant masthead. The title Admiral of the Fleet is merely an honorary distinction. A full admiral ranks with a general, and one who is actually the com-mander-in-chief of a fleet, with a field-marshal in the army; a vice-admiral ranks with a lieutenant-general, and a rear-admiral with a major-general in the army. The rates of full or sea-pay of admirals are,—admiral The rates of full or sea-psy of admirals are,—admiral of the fleet, £6 per day; admiral, £5; vice-admiral, £4; rear-admiral, £3. An admiral commanding inchief receives £3 per day additional when his flag is flying within the limits of his station. By an order in council (1851), the number of active flag-officers was reduced to 99, exclusive of admirals of the fleet, of whom there is, at present, one; being, 7 admirals, 9 vice-admirals, and 17 rear-admirals in each class. Besides these, there are, at present, about 200 flag-

officers on reserved half-pay, or retired.

ADMIRAL, in Conch., a beautiful shell of the Volute species, and comprising four kinds,—the Grand-admiral, the Vice-admiral, the Orange-admiral, and the Extra-admiral. The first is of a fine white enamel, with bands of yellow finely turned about the head, and the clavicle excited. It is principally characterized by a denticulated line along the centre of the large yellow band: this distinguishes it from the Vice-admiral. The Orange-admiral has more yellow; and the bands of the Extra-admiral run into each other.

ADMIRALTY, ud'-mi-ral-te, the office of lord high ad-ADMIRAITY, add-mi-ral-te, the office of lord high admiral, or of the commissioners appointed to discharge that office. The Admiralty Court is usually termed the Instance Court, to distinguish it from the Prize Court, which is only constituted in time of war. It has cognizance of all civil maritime affairs, which are determined according to the civil law, so far as the same be not inconsistent with the common, statute, or international law.

## Adoration

ADMIRALTY COURT (see ADMIRALTY).

ADMIRALTY DROITS (Fr. droit, right, prerogative), certain rights belonging to the Crown by virtue of its prerogative, and connected with the sear; as, greek

ADMITTANCE, id-mit'-tinse (Lat. admissio, admitto, I put in, I present with), in Law, is the giving possession of a copyhold estate; and is of three kinds:—
1. Upon a voluntary grant by the lord of a manor, where the land has eschested or reverted to him. where the land has eschested or reverted to him,—
2. Upon surrender by the former tenant,—3. Admittance by descent, which is where an heir is tenant
immediately on the death of his anestor. (Ref. Wood,
b. 2, c. 1.)—Admittance of a Clerk is when a patron of a
church being presented to it, the bishop, upon examination, admits the clerk by saying Admitto te habilem. It is, properly, the ordinary's declaration that he ap-proves of the presentee to serve the cure of the church to which he is presented.—Ref. Co. Litt. 344a.

ADMONITIO FUSTIUM, ad-mo-nish'-i-o, among the an-

cient Romans, a military punishment, not dissimilar to the modern whipping, except that it was performed

with vine branches.

with vine-branches.

ADMONITION, or Monition, dd-mo-nish'-un (Lat. moneo, I remind), a term used in Eccl. Law to denote the warning given to an offender before excommunication, or to a suitor before proceeding against him in panam continuaciae, or for default.

ADMATS, dd'-nuit (Lat. ad, to, and natus, a growing),

in Bot., a term applied to certain portions of a plant when they adhere to other portions; thus, when the stipules are united to the petiole, as in the leaf of the rose, they are called adnate stipules: when the anther is closely attached to the filament, as in the flower of the buttercup, it is said to be an adnate anther. term adherent has the same signification.

term adherent has the same signification.

Addented and a sponder of the consisted of a dactyle and a sponder or trochee; as rara juventa. It was so called from being first used in the elegies on Addents, the lover of Venus.

Addented and Addented and Addented and Addented and the banks of the Adonis, a river of Phomicia, where Addented and the or Themmus, as he is termed according to the Oriental style, was supposed to have received his death-wound. At certain periods of the year this river becomes tinged with a high red colour, caused by the washing up of portions of red earth. This discoloration of the waters was ascribed by the ancients to a supposed sympathy possessed by the river for the death of the lover of Venus. Milton, in his "Paradise Lost," thus beautifully alludes to the fact:—

> "Thammuz came next behind, Whose annual wound in Lebauon allured The Syrian damsols to lament his fate, In am'rous ditties, all a summer's day: While smooth Adonis from his native rock Ran purple to the sea, supposed with blood Of Thammuz, yearly wounded."

Ref. Calmet's Dictionnaire de la Bible, art. "Thammuz."

ADONIS, ā-do'-nis, in Bot., a genus of plants belonging to the Buttercup order, or Kanunculacea. The common adonis, or pheasant's-eye, is a favourite annual in English gardens. Its flower is of a bright scarlet, with a black spot or eye in the centre.

ADOPTION, ā-dop'-shun (Lat. ad, to, and opto, I choose), the act whereby one man makes another his heir. It was a common custom among the Greeks and Powers as it will be with the Turks and other

and Romans, as it still is with the Turks and other

eastern nations.

ADOPTION CONTROVERSY, a strife which arose in the Church, in Spain, towards the end of the 9th century. The leaders in this controversy were Felix of Urgellis and Elipandos of Toledo, who held that Christ in his human nature was the son of God only by adoption. This doctrine was condemned at an assembly summoned by Charlemagne, at Ratisbon, in 792; at the council of Frankfort-on-the-Maine, in 794; and at the synod of Aix-la-Chapelle, in 799. The controversy ceased on the death of the two leaders.

ADDATION, àd'o-rai'-shun (Lat. ad, to, and oro, I pray), a term denoting the act of worshipping the Supreme Being. It was anciently done by prostrating the body with the face to the earth, as an action naturally

#### Adores

flowing from the despest humility of mind; the con-cealment of the face being strongly and most appropri-stelly expressive of the worshipper's total unworthiness so much as to lift up his eyes before the great object of his worship.

ăd-o-re'-ă, a term of various acceptation ADOREA, among the Romans, sometimes signifying grain in general, at others a kind of cake offered in sacrifice; and again it was used to denote the gratuitous distribution of corn; whence it became applied to all forms of

reward.

Abox., a-dox'-ā (Gr. a, without, and doxa, glory), in Bot, the Moschafel, a genus of plants belonging to the Lyy ord, or Aralica. The typical species, at noschatellian, is a carious inconspicuous little plant, having a tuft of pale green flowers.

AD QUOD DAMNUM, däm-num (Lat., to what damage), in Law, a term applied to a writ issued by the Crown, to inquire whether a royal grant, such as a market, fair, &c., would be to its damage.

ADRAGATE. (See TRAGACANTE.)

ADRIFT, ü-drift' (Ang. Ssx.), in Mar., a term signifying that a vessel has broken loose from her moorings, and is driven to and fro by the winds and waves.

ADSIDELLA, ü-si-del'-lä, among the Romans, the table at which the flamens sat during the sacrifices.

ADULARIA, "dd'-u-lui'-ri-ü, in Min., a kind of felspar, resembling clear transparent glass. It is found in volcanic districts, and is named from Mount Adula, in Switzerland.

ADULT, &-dult' (Lat. adultus, grown up), in a gene-ADULT, d-dult' (Lat. adultus, grown up), in a general sense, a term signifying anything grown up to, or arrived at maturity. It is also applied to that period of human life which extends from manhood to old age.

ADULTERITION, ä-dul-te-rai'-shun (Lat. adultero, I falsify, corrupt), the introduction of cheap and often injurious materials into natural and manufactured.

factured products, for the purpose of increasing the profits on their sale. This practice is still unfortuprofits on their said. This practice is som unfortunately carried to a great extent, though a special act of parliament has been passed to check it. Full particulars of the most common adulterations will be found under the heads of articles of food. (See FLOUR, BREAD, ARROW-ROOT, &c.) When the adulteration consists of a mineral substance, its nature is readily determined by chemical analysis; but when it consists of an organic products the aid of the microscope is required to find it out. The practice of aduteration has frequently led to fatal results.

ADULT-SCHOOLS, establishments for the instruction of those persons who have not been educated in or those persons was have not over educated in their youth, in the elementary branches of know-ledge. The Rev. T. Charles, a clergyman of Meriomethalire, finding that several of the grown-up parishioners attending his Sunday-school, disliked to learn by the side of children, first formed an adultschool, in 1811; and at about the same time, though without any connection or correspondence with the establishment in Wales, Mr. W. Smith opened a school in Bristol. Smith was a doorkeeper at a dissenting chapel, and out of his weekly wages of 18s. gave 3s. towards the expenses of the school. A society was afterwards formed for the advancement of his beneatterwards formed for the southercement of his bene-volent intentions, and adult-schools were established in various parts of the country,—in Ipswich, Norwich, Salisbury, Sheffield, Plymouth, Uxbridge, and else-where. (Ref. Pole's History and Origing) Adult Schools.) In the present day adult-schools rather enable young men who have received the rudiments of education, to make further progress, than teach the totally unlettered. They are to be found in several mechanics' institutions, in the Working Men's College, and other places of a similar description. At King's College, London, the evening classes, which give the privilege of a university examination, are invariably well stiended. To cite a proof of the necessity of such schools for the moral and includental subjects of the house of the necessity of such schools for the moral and intellectual culture of the labouring classes:— In 1841, 33 per cent. of the men, and 49 of the women, could not write their names on their marriage. In 1856, the percentage was reduced to 29 of the men, and 40 of the women.

ADUBERATION, &d-um-brail-shum (Lat. ad, to, and usebra, a shadow), in Her., denotes that the shadow only of a figure is outlined and painted of a darker

colour than the field.

## Advertisement

AD VALOREM, và-lor'-em (Lat., according to the value), a term used for those duties or customs which are paid according to the value of the goods.

ADVANCE, advans, in Com., a term applied to money paid in part, or wholly, before the delivery of goods purchased, the execution of work, or the performance

of any business.

ADVANCED DITCH, or MOAT, a term used in Fort, to denote the trench surrounding the glacis or esplanade

of a place.

ADVANCED GUARD, or WANGUARD, is the first line or division of an army, placed in order of battle. It also denotes a party of cavalry stationed before the main guard.

Advent, as -vent (Lat. adventus, coming), a term applied by the Christian church to certain weeks before Christmas. Auciently, the season of Advent consisted of six weeks, and this is still the duration of it in the Greek church. In the Romish church, however, and in the Protestant churches that observe Advent, it only lasts four weeks, commencing with the Sunday nearest St. Andrew's day (Nov. 30), cither before or after. It is appointed to be observed as a season of devotion, being intended to commemorate the coming of Christ in the flesh, and to direct the thoughts to his

of Christ in the flesh, and to direct the thoughts to his second coming. This season was observed with great austerity by the primitive Christiaus.

ADVENTITIOUS ROOTS, in Bot., roots which are not produced by the direct elongation of the radicle of the embryo. They generally spring from the true roots, from suckers, runners, builds, and other subterranean modifications of the stem. Adventitious roots are sometimes given off by the stems and branches, and are then termed agrial roots. In the Indian fig, or banyan, and the mangrove, these roots descend to the ground, and help to support and nourish the parent stems.

stems.

ADVENTURE, BILL OF, ad-ven'-lure (Fr. aventure, hazard), a writing which is signed by a merchant. and which states that the goods on board a vessel ere the property of another, who is to run all risk, the merchant only binding himself to account for the produce.

ADVENTURERS (Fr. aventurier), in Com., those traders who formerly undertook the discovery of distant lands, and the settlement of far-off colonies, and formed themselves into a company called the Merchant Adventurers. The term was also applied to a mer-chant vessel trading without a license within the

boundaries of a company's grant.

Advers, ad-rerb, in Gram., a part of speech, or class of words, so called from being generally joined to verbs, like adjectives to nouns, for the purpose of qualifying ther meaning. Adverbs are also joined to adjectives and other adverbs. According to their signification, adverbs are divided into those of number, order, time, place, quantity, manner, &c.; as, once, firetty, now, here, nuch, well. Many adverbs are formed from adjectives by adding the termination ly; as, wise, wisly.

ADVERSA, ad-ner'-sa (Lat. ad, to, and versus, turned towards), in Numis., a term applied to those coins

wherein the heads are seen facing each other.

ADVERSARIA, dd'-ter-sai'-ri-a, a term employed by
the ancients to denote a kind of common-place book, or journal, in which were inserted remarkable occurrences. At the present day the term is more particularly used among men of letters, to designate a kind of common-place book, wherein is entered whatever may occur worthy of notice, whether in reading or conversation.

ADVERSATIVE, üd-ver'-sa-tif, in Gram., a term denoting a difference between what precedes and that which follows it; as in this sentence, "He is benevolent, but poor;" the word but is an adversative conjunction.

poor;" the word but is an adversative conjunction.

ADVERTISHMENT, adver-tis-ment (Fr. avertisement),
an announcement or notice of any kind, generally such
as are published in newspapers, &c. The first English
advertisement that can be found is in the Imperial
Intelligencer for 1649, and relates to stolen horses.
In 1712 a tax was first imposed upon advertisements,
In 1833 the tax was reduced from 3s. 6d. to 1s. 6d. in
Great Britain, and from 2s. 6d. to 1s. in Ireland; and
in 1853 it was abolished altogether. In 1832 (the year
before the reduction) the total number of newspaper
advertisements in the United Kingdom was 921,943;

## Advice

viz., 787,649 in England, 108,914 in Scotland, and 125,380 in Ireland,—the duty amounting to £172,570. In 1841 the total number of advertisements was 1,778,957, and the duty amounted to £128,318; in 1851 the latter had risen to £175,694. Since the abolition of the duty, the number of advertisements has vastly increased, though there is no means of arriving at very a probable estimate of their number. The increase manifests itself not only in old-established papers, as the Times, which has more than doubled the number of its advertisements, but in the great number of of its advertisements, but in the great number of papers that have spring into existence since that time, some of which daily contain a great number of advertisements. One of these, the London Daily Telegraph, had on 13th November, 1861 (an average number), 568 advertisements. The Times (taking average numbers) contained, on 1st February, 1853, 1,086 advertisements; and on 21st November, In almost every case it is the advertisements 2,480. In amost every case it is the advertisaments by which newspapers are supported, the sales even of the higher-priced papers being insufficient to pay for the paper, printing, editing, &c. The sums annually spent by some who issue advertisements are very considerable. We give the following, on the authority of the writer of an interesting article on this subject, in the writer of an interesting article on this student, in the Quarterly Review for June, 1855:—Holloway (pills, &c.), £30,000; Mosea & Son, £10,000; Rowland & Co. (Macassar oil, &c.), £10,000; De Jongh (cod-liver oil), £10,000; Heal & Sons (bedsteads and bedding), £6,000; Nichol (tailor), £4,000.
ADVICE, ăd-vice' (Fr. avis), in Com., is information

respecting trade communicated by letter; thus, an respecting trade communicated by letter; thus, an advice is generally sent by one banker or merchant to another, to inform him of the drafts or bills drawn on him, with full particulars of their sum, date, to whom made payable, &c. This document is termed a "letter of advice," and the practice prevents mistakes, and at times detects forgeries; for when bills are presented for payment or acceptance, they can be refused

to be honoured for want of advice.

AD VITAM, AUT CULPAM, a phrase signifying that an office is to be held by a person till his death, or, more properly, during his good conduct.

properly, during his good conduct.

AUVOCATE, 'id'-vo-kait' (Lat. advocatus, one who gives legal assistance), among the Romans, one who pleaded the causes of others. The term is still used in those countries where the Roman law prevails. In the courts of civil law, in England, he is required, before discharging his duties, to take the degree of D.C.D. in one of the English universities. In Edinburgh there is a Faculty of Advocates, who constitute the Bar of Sootland. The Lord Advocate is a state officer in that country, who pleads the king's causes. The Advocates' Library, belonging to the faculty, is, perhaps, the third largest in the kingdom, that of the British Museum and the Bodleian only being considered superior. (See Library.)

that of the British Museum and the Bodiesh only being considered superior. (See Library.)

ADVOCAME FISCAL (Lat. fisci advocatus), an officer under the Roman emperors. He pleaded causes belonging to the private treasury.—Advicates consistorial, officers in the consistory at Rome, who plead in cases of consisting to the disposal of hyperficial.

of opposition to the disposal of benefices

ADVONSON, id-low-son (Ang.-Nor.), in Eccl. Law, the right of patronage, or of presenting to a benefice. The person enjoying this right is called the patron, who is bound to protect the interest of the church as well as the rights of the incombent whom he has presented to it.

ADYTUM, a-di'-tum (Gr. adyton, a recess), in Arch., a term in use among the ascients, signifying the most sacred part of their temples, to which none but the priests had access, and from which the oracles were delivered. The Sanctum Sanctorum, or most holy place of the temple of Solomon, at Jerusalem, was its adytum. Strabo describes an adytum of an Egyptian temple under the name of secos. In the small temple

at Pompeii there is an adytum in good preservation.

Adze, ids (Sax. adece), a cutting-tool, of the axe kind, having its blade thin and arching, and its edge at 

#### Almeid

Acidium, s-sid'-i-um, in Bot., a genus of microscopic parasitic fungi. There are numerous species, some or which infest useful garden plants, such as the mint and the gooseberry.

ADEs, e'dees (Lat, a building), in Arch., among the Romans, signified an inferior kind of temple, dedicated

Homes, signined an interior and or temple, against to some detry, but not by the augurs.

ÆDILE, e'-dile (Lat. ædes, a building), the term applied to certain Roman magistrates, who had the superintendence of public buildings, highways, bridges, weights and measures, &c. They had also the charge of the public morals, and the regulation of theatrical performances and diversions. They were four in numperformances and divoraions. They were four in num-ber, two plebeian and two curule; the former elected from the common people (plebs), the latter at first from the patricians, but afterwards from plebeians and patricians promiscuously. They were so called from their giving judgment on ivery seats (sella curules). Julius Cassar added two more, termed addles cereales, who had the inspection of the granaries. The addless had great recover in the state and save allegand the the robe of honour (toga pratexta).

AEGAGBUS, e-gai-grus, the Paseng of the Persians, a

wild species of Ibex. (See GOAT.)

Man species of near, (see GOAL).

Ægiceras.

Ægiceras.

Ægiceras.

This includes but one genus, of which there are five species. These plants grow near the sea in tropical regions, throwing out adventitions roots into the mud, like mangroves.

ÆGLOOFS, e'-ji-lops, in Bot., a genus of Glumacea, the Grass order. The species Ægilops ovata was formerly supposed to be the origin of all the varieties of cultivated wheat; and it is undoubtedly true that a kind of wheat may be produced by the union of this plant with a species of Triticum. The hybrid, after about twelve years' cultivation, becomes a wheat-bearing grass.

ÆGINETAN ART, e-ji-ne'-tan, the fine arts as executed by the people of Egina, especially sculpture, specimens of which, in the form of casts, are now in the Phigolian saloon of the British Museum. The originals are at Munich, having been purchased by the late king of

Bayaria.

Ægis, e'-jis (Gr. aigis, a goat-skin coat), among the ancient Greeks signified

the shield of Jupiter, by whom it was given Minerva. According to Homer, the shield was covered with the skin of the goat Amalthea. nerva afterwards fixed upon it the Gorgon's head (see Beston's Dict. of Biography), and thus endowed it with the endowed it with the power of turning into atone all those who looked at it. The term was also employed to denote the breastplate of a god, and finally it came to be applied to the cuirass of distinguished persons. In the British Museum there is an armed statue of the emperor Hadrian, which affords an example of the use of the ægis as a breastplate.

AGLE, e'-gle, in Bot., a genus of Aurantiaceæ,

ÆGIS.

the Orange order. The bark of the Æyle marmelos, or Indian bael, has been introduced into this country as a remedy for diarrhous. The rind of its ripe fruit yields an agreeable perfume. ÆGOMANTIA, e-go-mān'-shi-a (Gr. aix, gont, manteia, divination), a term used by the ancient to express a mode

ACCOUNTAGE OF THE USE OF THE ACCOUNT OF THE ACCOUNT

ANEID, e'-ne-id, the celebrated epic poem written Virgil in the time of Augustus Cæsar, which relates

## **Alnigma**

the wanderings of Eneas after the capture of Troy, his arrival in Italy, and his adventures previous to his marriage with Lavinia and settlement in Latium. The poem consists of twelve books. The first six contain a description of the wanderings of the hero; the others of his arrival in Italy, and the war between the Trojans and the natives. It was commenced about A.U.C. 724 or B.C. 30, the author continuing to labour upon it till his death, B.c. 20.

Emgua, e-nig-ma (Gr.), is a Greek term for what is commonly called a riddle. It denotes any dark asying or question, wherein some well-known thing is concealed under obscure or indirect language.

MOUIAN HARP, e-o'-li-an (Lat. Zolus, the god of the winds), a kind of harp formed of a number of catgut strings, tuned in unison, and stretched across a deal box, open at the sides. The box is placed on the sill of a window, and the sash shut down upon it; the wind blowing into the room across the strings produces an harmonious mixture of sounds, resembling a distant choir, rising or falling according to the strength of the blast. The same effect is produced on a grander scale by the wind passing through the wires of a line of telegraph. The Æolian harp is easily made, care being taken to preserve the strings in strict unison. It is generally supposed to be the invention of Father Kircher, the celebrated organ-builder.

ROLIO DIALECT, e-ol'-ik, among Grammarians, one of the five dialects of the Greek tonguo, agreeing in

most things with the Doric dialect.

ABOLIC VERSE, in Pros., a kind of verse, consisting of an iambus or spondee, then of two anapests, separated by a long syllable, and lastly of one long or short

syllable

MOLIFIEE, e-ol'-i-pile (Lat. Æolus, god of winds, pila, a ball), a hollow ball of metal, to which a pipe is attached. On being illed with water, and placed on the fire, the steam issues from the tube with sufficient force to turn a wheel placed within its power. Branca, an Italian mechanician of the 17th century, is supposed 

ÆQUILATERUS. (See EQUILATERAL.) ÆRA. (See ERA.)

ERABIUM, e-rai'-ri-um (Lat.), among the Romans, the term applied to the place where the public money was kept, the care of which devolved upon the questors. Erarium sanctum, a place to contain the moneys arising from the twentieth part of legacies reserved for the use of the state. Erarium pricatum, the emperor's private purse. Erarium Ilithia, the place where the moneys which parents paid at the birth of each child were deposited.

ABRATED WATERS, ai'-e-rai'-ted (Gr. aer, air).—This ARRATED WATERS, at e-rai'-ted (fir. aer, air).—This term is applied to drinks in which water is impregnated with gases by pressure. The best known of these is the so-called sode-water, which generally consists of plain water charged with carbonic-acid gas. This is effected by submitting the water to carbonic acid under a pressure of 30 or 40 lbs. to the square inch, and bottling it off without any diminution of the pressure. On uncorking the bottle, the imprisoned gas is released, and taken into the stomach in the form of bubbles. and taken into the stomach in the form of bubbles. Various mineral constituents, such as soda, potash, lithia, the salts of iron, and magnesis, are often introduced into the water with excellent medicinal effects. Afrated drinks, such as effereecing lemonade, are often impregnated with air only; but this is easily detected by the taste of the gas.

Afratrom of Soils, ai'-e-rai'-shun, is the impregnating them with air, by ploughing, harrowing, &c., so that the air may enter the pores of the earth.

Afrata Bulbs, ai-eer-i-al, in Bot., small conical or rounded bodies of the nature of bulbs, which grow in the axils of the leaves of certain plants. They may be

rounded bodies of the nature of bulbs, which grow in the sxils of the leaves of certain plants. They may be seen in the bulbiferous lily and in the pilewort.

ATRIAL IMAGES. (See MIRAGE and FATA MORGARA.)
ATRIAL LEAVES, in Bot., leaves which grow in the air, as distinguished from submerged leaves, or those which flourish under water.

# Aeronaut

ABRIAL PERSPECTIVE, a term used in Paint to signify the diminution in the colour and brilliance of objects seen at a distance, and which causes them to look more or less remote.

look more or less remote.

ARHAL Roors, in Bot., those adventitious roots which are produced in the air. The little threads which spring from the stem of the ivy, the descending columns of the banyan-tree, and the green fibres thrown out by the curious air-plants, are examples.

AERO-DYNAMICS, av. e-vo-di-ndm'. ike, (Gr. aer, air, and dynamis, power), is the science which treats of properties of acriform fluids in a state of motion.

The causes which disturb the quiescence of the air are very numerous. Currents are created in innumerable ways; amongst others, by the local change of tenperature induced by the presence or absence of the sun; by the permanent difference of temperature between the polar and equatorial regions; and by the rotation of the earth on its axis. It is also effected by the evaporation of the sea and rivers. Aqueous vapour being much lighter than the sir, causes motion in its passage to the cloud region. The science of acro-dynamics is most important in the way of affecting the well-being of mankind. The researches of Admiral Fitzroy have proved that it is quite possible to predict the blowing proved that it is quite possible to predict the blowing of wind from any particular quarter; and, by sero-dynamical calculations, the Admiralty is now able to forward telegrams to different parts of the coast, warning sailors of coming storms. The laws which govern projectiles are properly part of this science. (For a further consideration of this part of the subject, see PROJECTILES; see also RIVLE, GUNNEEY, ANEMOMETER ACQUISTICS 1

METER, ACOUSTICS.)

AEROGRAPHY, ai-e-rog'-ra-fe (Gr. aer, air, and grapho, I write), the description of the nature, properties, and phenomena of the atmosphere. (See ATMOSPHERE.)

AEROLITE, ai'-e-ro-lite (Gr. aer, air, lithos, a stone), a stone fallen from the atmosphere; a meteoric stone. The source of these bodies has greatly puzzled philosophers. Many suppose them to have been projected from lunar volcances to such a distance as to come within range of the earth's attraction; others give them a terrestrial volcanic origin. The generallygive them a terrestria voiceme origin. An egenerally-received opinion is that started by Laplace, who supposes them to be masses of matter,—small planets, in fact,—revolving round the sun, and coming within range of the earth's attraction. This opinion is carried out by the fact of showers of meteors occurring at resident integrals. For example, Aug. 22-13. periodical intervals; for example, Aug. 7 to 12, Nov. 10 to 16, when large quantities of these bodies may be seen nightly in all directions. The heat caused by their passing at an inconceivably rapid rate through the air is sufficient to render them incandescent. They the air is sufficient to render them incandescent. They are mostly of uniform composition, consisting principally of silica, magnesia, and iron, with small quantities of nickel, sulphur, and chromium. Some of them are very large, weighing upwards of 300 lbg. Shooting stars are supposed to be meteoric stones which are consumed by the heat generated in their passage to the earth. Philosophers long disbelieved in their existence. The fact has, however, long been placed beyond doubt by the researches of Laplace, Chladni, and others others.

AEROMANCY, ai'-e-ro-man-se (Gr.aer, air, and manteno, I divine), a term applied to a mode practised by the ancients of predicting future events from certain ap-

pearances in the air.

ARBORNETRY, at'-er-om'-e-tre (Gr. aer, air, and metreo, Imeasure), the art of measuring the air, so as to obtain a knowledge of its bulk, density, &c. The instrument employed to ascertain the bulk of gases, &c., is called un aërometer.

ABBONAUT, ai'-s-ro-nawt (Gr. asr, air, and nautes, a sailor), one who travels in a balloon. The most celebrated acronauts were the brothers Montgolfier, who were the aëronauts were the brothers Montgolder, who were she first to make an ascent in this manner, in 1783; Blanchard, who first crossed the Channel in 1785; Garnerin, to whom we ewe the invention of the parachute; Pilatre de Rozier, who lost his life by imprudently ascending in a Montgoliler balloon, above which was placed a second filled with hydrogen; Madame Blanchard, who was burned during a display of fireworks from the car; and, in our own day, Mr. Charles Green, who has crossed the Channel several times, and has made up-

# Aerophytes

wards of a thousand ascents; Cocking, who was killed by descending in a parachute made of tin tubes a few years since; and, lastly, Mesers. Godard and Poitevin, who risk their lives by ascending on the backs of lions, or swinging on ropes attached to the car.

AECOPHYTES, al'-e-ro-files (Or. aer, air, and phyton, a plant), in Bot., plants having only agrical roots. (See AIR-PLANTS.)

AIR-FLANTS.)
ARROSTATION, al'-e-res-tai'-shun (Gr. asr, air, and stao, I stand), the art of raising bodies into the air by the nied of gases, &c. (See BALLOON.)

ÆRUGO, e-ru-po, the ancient name for a bright green rust or verdigris, produced by the action of the air upon copper, brass, and bronze. The Romans considered that the ærugo added to the beauty of their statues.

ÆRUGO, PORTS - AMERICA PORTS - AMERICA PORTS

ÆRUSCATORES, e-rus-ka-to'-rees, a name given by the ancients to those strolling beggars who obtained money by fortune-telling. The term was also applied to the priests of Cybele and the collectors of taxes.

Es, ee, a bronze coin of the Romans, consisting of the æs rude, æs grave, and æs signatum. The two first were paid by weight, but the last in number. Æs flauum, among the Romans, was used to designate bronze of an inferior description.

ESCHENOMENE, ees'-ki-nom'-i-ne, in Bot., a genus of leguminous plants. The species are numerous, and most of them natives of India. The stems of the Mechynomene paludosa furnish the shole, or Indian ricepaper, and, on account of their extreme lightness, are used for making floats and buoys. Æ. cannabina yields

He fibre known as Duchai hemp.

Asculus, ees'-ku-lus, in Rot., the Horse-chestnut, a genus of the Sospwort order, or Sapindaceae.

Asculus genus of the Soapwort order, or Sapindaces. Escalus Hippocastanum, the common horse-chestnut, is the typical species. This is a remarkably handsome and very useful tree. Its timber is used for turnery and fuel, and its seeds have long been employed in Switzerland for feeding sheep. Its bark, which contains a peculiar principle called Escalin, is febrifugal, and is occasionally used in medicine, while its young leaves are somewhat aromatic, and have been substituted for home. In France large quantities of starch are obtained hops. In France, large quantities of starch are obtained from the seeds, which, in England, are considered worthless. A peculiar oil, which is said to be a wonderful remedy for rheumatism, is also extracted from these seeds. The roots and leaves of the American

these seeds. The roots and leaves of the American borse-chestunt, or buck-eye, are considered poisonous.

\*\*Estratics, ees-thet\*-iks (Gr. aisthetikos, perceptible to the senses), the science of the Beautiful in Art. The word was first employed about the middle of the 18th century by Alexander Baumgarten, a follower of Christian Wolf, and professor of philosophy in the university of Frankfort on the Joder; and, having leave found both convendencing and daintie it was been found both comprehensive and definite, it was generally adopted by the French and English art-writers. According to the theories of the soundest writers. According to the theories of the soundest psychologists, human nature may be divided into the capacities of knowing, acting, and feeling; in other words, into intellect, will, and sensibility. To these capacities correspond respectively the ideas of the True, the Good, and the Beautiful. That which logic is words, into intellect, will, and sensibility. To these capacities correspond respectively the ideas of the True, the Good, and the Beautiful. That which logic is to intellect, ethics to will, is esthetics to sensibility. The laws of thinking are determined by logic, the laws of acting by ethics, and the laws of feeling by sethetics. As the ultimate aim of thought is truth, as the ultimate aim of action is good, so is beauty the ultimate aim of setion is good, so is beauty the ultimate aim of action is good, so is beauty the ultimate aim of setion is good, so is beauty the ultimate aim of action is good, so is beauty the ultimate aim of favore and leave and Plato downward, have endeavoured to place the laws of taste upon a definite basis, like those of ethics and logic. To fully explain and discuss the respective systems of exthetics would require a volume; it will be sufficient here to indicate the two principal modes of treating exthetics as a science. Those philosophers who have employed the à priori method have sought to analyze the usthetic notions proper to the mind, and to erect upon a definite basis, like those of ethics and logic. To fully explain and discuss the respective systems of exthetics would require a volume; it will be sufficient here to indicate the two principal modes of treating exthetics as a science. Those philosophers who have employed the à priori method have sought to analyze the usthetic notions proper to the mind; of a priory. An action for ibel will not lie for any defamicary statement contained in it, put the person of eachige to the offensive mater. By the 6 & 0 Will. IV. c. 62, in all extraidensatory statement contained in it, put the person and it is put the person defamically statement contained in it, put the person of the person and it is put the offensive mater. By the 6 & 0 Will. IV. c. 62, in all extraidensatory statement contained i

## Affiliation

priori method, and in the a posteriori, Aristotle leinae, Lessing, Winokelmann, Bayle, Roussess, and à priori method, and in the à posterieri, Arithèlie, Heinze, Lessing, Winckelmann, Bayle, Roussein, and the greater portion of the Italian, Franch, and English writers upon the laws of taste. In England, however, the aim of the various philosophical speculators has been to discover, not the idea of the Beantiful, like the Germana, but the Beautiful itaelf.— Eef. Jouffroy's Cours d'Esthétique; Cousin's Le Vrai, le Beaut, et le Bon; Schiller's Treatise on Absthetics; Burke's Treatise on the Subleme and He Beautyful; Alison's Essays with Nature and Frinciple of Taste.

Abstruction, ses-in-vai-shan, in Bot., a term signifying the summer state, is applied to the general arrangement of the different parts of the flower. When, those parts are placed in a circle, and in nearly the same plane,

parts are placed in a circle, and in nearly the same plane, the sestivation is said to be circular, and when they are placed at slightly different levels, so as to overlap, each other, it is said to be piral. The term prafferation is used by some botanists instead of assivation.

ESTUARY. (See ESTUARY.) ÆTHER. (See ETHER.)

ETHER. (See ETHER.)

ETHURA, e-thu-sa, in Bot., a genus of umbelliferous plants. Ethusa Cynapium, fool's paraley, is a common indigenous plant, highly poisonous, which has been frequently mistaken for paraley.

ETTOLOGY, e'-ti-ol'-o-je (Gr. atita, a cause, and logos, discourse), in Rhet., a figure of speech, by which the causes of an event are developed in the narrative.

ETOBATES, e-to-bai'-tees, a genus of fossil fishes allied to the Rays, the species of which are found at Sheppey, in the London clay.

AFFA, df-fa, a weight in common use on the Gold Coast of Guinea, the half of which is called eggeba. They equal the English ounce and half-ounce. The negroes on the Gold Coast invariably give these names to these weights.

Affale, af fair', any action or engagement not of sufficient magnitude to be termed a battle.

AFFECTED, Or ADFECTED EQUATIONS, in Alg., are those in which the unknown quantity is found in two or

more different powers; for example,  $x^2 - px^2 + qxx + x^2b$ ; in which are three different powers of x.

AFFETTOOS, of-fet-too-o-zo, asign in Music, by which is intimated that the part to which it is applied must be played in a tender, moving manner, and rather

slow than fast

AFFICHE, af'-feezh (Fr. affiche), a word generally used by the French to describe posting-bills, or any adver-tisements, large or small, either posted upon walls or distributed by hand, to make anything known to the

AFFIDAVIT, of f-f-dai'-vit (Lat. affido, I pledge faith to), in Law, is a statement, in writing, of facts for the information of a court in a cause or matter pending, or about to be commenced therein; or to comply with particular statutes relating to the revenue and otherwise. Unless it be used in a cause or matter in court, or be made before the Commissioners of Inland Revenue, or exempted by statute, it must bear a stamp of 2s. 6d. Any person making a wilfully false statement in it, material to the question or subject which it is intended to support or disprove, is liable to be indicted for perjury. An action for libel will not lie for any defamatory statement contained in it; but the person made subject to the defamation may apply to the court to refor it to its officer to strike out the offserive or be made before the Commissioners of Inland Reve

or delivered of a bastard child, may, either before the birth, or at any time within twelve months from the birth, make application to a magistrate, charging a person by name as the father of her child; and, where the alleged father has within twelve months paid money for its maintenance, such application may be made at any subsequent period. The magistrate, on the evi-dence of the mother, corroborated in some material markinglar by other testimony to his artifaction. particular by other testimony to his satisfaction, may make an order on the putative father for payment of costs, and of a weekly sum not exceeding 5s. per week for the first six weeks from the birth, and afterwards not exceeding 2s. &d. per week, for the maintenance of the child; 10s. for midwife, and 10s. for funeral ex-penses, if the child die before making the order. The erder will remain in force until the child attain the age of thirteen, or die, or the mother be married. If the mother allow the payments to remain in arrear for more than thirteen weeks, she cannot recover them for a longer period. The party charged may appeal from the order to the court of Quarter Sessions, upon such cotter to the court of quarter Sessions, upon entering into a recognizance to try the appeal and pay such costs as may be adjudged. In default of payment of the moneys provided for by the order, the putative father may have his goods distrained upon, or, if he have none, be committed to prison, and so from time to time. (See BASTAED.)

ATELITY, of find-i-te (Lat. of, for ad, to, and finis, a boundary or limit), in Law, is relationship by marriage, as consenguinity is by blood. Within the prohibited degrees, no person may marry. (See MARRIAGE.)

as consequency is by blood. Within the prohibited degrees, no person may marry. (See Marriage.)
Appinity, or Chemical Attraction, is the force which causes the particles of dissimilar kinds of matter to combine together, so as to form new matter. This definition indicates the differences between affinity and cohesion, which is another modification of molecular attraction. Cohesion merely binds similar particles into a mass; affinity brings about the combination of heterogeneous particles, and causes them to lose their individual properties. The change of characters which follows the action of affinity is or characters when issues the action is almost any very wonderful;—for example, the inflammable metal sodium unites with the sufficienting gas chlorine, and the compound thus produced is chloride of sodium, or common salt, a substance which does not bear the slightest mon sait, a substance which does not bear the slightest resemblance to either of its components. Chemical combinations do not take place indifferently, but in accordance with certain strict rules or laws. One substance will unite with another in preference to a third, or in some cases in preference to any other. This preference is denoted by the term elective affinity. By means of this discriminating action of affinity, some combinations may be decomposed. If for intractions means or this discriminating action of aminity, some combinations may be decomposed. If, for instance, there be a substance (X) composed of two elementary bodies (A and B) which have a slighter affinity for each other than one of them (A) has for a third element (O), then, if we bring this third body into connection with them under the requisite conditions, the one (A) which has the greatest affinity for it will leave one (A) which may the greatest attnive for it will leave the other (B), and unite with it to form another com-pound (Y). The decomposition of water by red-hot iron illustrates such a case; for if water, which is composed of the elements oxygen and hydrogen, be passed through a tube containing iron flings heated to redness, its oxygen will unite with the iron to form a kind of rust, and its hydrogen will be set free. In every kind of rust, and its hydrogen will be set free. In every case where one constituent is expelled by a new body, and thus liberated, the decomposition is said to be the result of single elective affinity; but, when two substances, each consisting of two constituents, act reciprocally upon each other so as to produce two new compounds, the decomposition is referred to duable cleative affinity. This double reaction takes place when a chloride of phosphorus is thrown into water; the chlorine leaves the phosphorus, and unites with the hydrogen of the water to form hydrochloric acid, while the remaining elements, phosphorus and oxygen, enter hydrogen of the water to form hydrochloric and, while the remaining elements, phosphorus and oxygen, enter into combination and produce phosphoric acid. An idea formerly prevailed, that the affinity between any two substances never varied, and great labour was bestowed on the preparation of tables exhibiting the precedence of affinities. Modern chemists, however, do not regard affinity as a fixed and regular force, and the tables alluded to are now considered useless. The attraction of one body for another is greatly modified

by the circumstances under which the two bodies are brought together. Alteration of temperature is one of the causes which influence the force of chemical of the causes which influence the force of chemical attraction. When metallic mercury is heated nearly to its boiling paint, and exposed in this condition to the air for a lengthened period, it absorbs oxygen, and becomes converted into a dark red crystalline powder. But this same oxide of mercury, when raised to a still higher temperature, parts with its oxygen, which leaves the mercury in its original metallic state. Insulubility and the power of vaporization are notent disturbility the mercury in its original metallic state. Insolubility and the power of vaporization are potent disturbing influences; they interfere in almost every reaction, and frequently turn the scale when the opposing affinities are nicely balanced. Thus, when a solution of lime in hydrochloric acid is mixed with a solution of carbonate of ammonia, a double reaction ensuese carbonate of lime and chloride of ammonium being generated. This result is brought about mainly by the insolubility of the carbonate of lime. Again, a mixture of dry carbonate of lime and chloride of ammonium. of dry carbonate of lime and chloride of ammonium, when heated in a retort, gives a sublimate of carbonate of ammonia, while chloride of lime remains behind. In this instance, the great volatility of the new ammoniacal salt determines the nature of the decomposition. What is called the nascent state is one very favourable to chemical combination. Thus, carbon and nitrogen to chemical combination. Thus, caroon and mirrogen refuse to combine with hydrogen under ordinary circumstances; but, when these gases are associt or newly evolved, as when they are simultaneously liberated from some previous combination, they unite readily. Some remarkable decompositions are referred to a peculiar modification of chemical force, to which the term disposing affinity has been applied. The prepa-ration of hydrogen from zinc affords a familiar example of such decompositions. A piece of polished zinc put into pure water remains perfectly bright for any length of pure water remains perfectly bright for any length of time, and manifests no power of decomposing the liquid. On the addition, however, of a little sulphuric acid, the metal becomes oxidized, and hydrogen is freely disen-aged. The acid dissolves the oxide as fast as it is produced, and thus keeps the surface of the metal exposed to the action of the water. This function of the acid is perfectly intelligible; but its disposing influence, under which the oxide is first formed, is not well understood. Affinity is generally much stronger between bodies which are very unite ench other, than between bodies which are very units each other, than between bodies which are very units each other, than between bodies which are closely allied. Thus, potassium and sodium tend strongly to units with chlorine and iodium, but the bodies of each pair do not attract one another with sufficient force to enter into combione mouner with sumercut force to enter into combination. The discoveries of Faraday and others have established the fact, that whenever two substances unite to form a compound, they are in opposite electrical conditions; one being electro-negative, and the triest conducing; the neing electro-negative, and the other electro-positive. This and other facts go to prove that chemical affinity is a particular modification of electrical attraction. (See ElectroCutsus). The word "affinity" appears to have been employed for the first time by Barkhausen, a German chemist, in his "Flements of Chemistry," published at Leyden in 1703. ments of Chemistry," published at Leyden in 1703. The elder Geoffrey issued the first table of affinities

The elder Geoffrey issued the first table of affinities fifteen years later; and more extensive tables were afterwards compiled by Wenzel, Bergmann, Guyton-Morveau, and other chemists of the last century.

AffirmAtion, Affirmation, the last century.

AffirmAtion, The main and Lat. affirmatio, from firmo, I support), in Law, signifies the ratifying or confirming a former law or judgment. Thus we say, the House of Lords, on an appeal, affirmed a decree of the lord-chancellor, or of the Court of Session, and the lord-chancellor, or of the Court of Session, and the lord-chancellor, or of the Jords justices, affirmed the of the forti-enancellor, or of the Court of Session, and the lord-chancellor, or the lords justices, affirmed the decree or order of a vice-chancellor, &c. It is also a solemn form of attesting the truth allowed to be used by the Friends or Quakers, instead of an oath, which they hold absolutely unlawful to take. AFFIRMATION, in Gram, a term applied to such particles as affirm or assert, in opposition to such as

deny a statement.

AFFIRMATIVE QUANTITY, in Alg., signifies a quantity to be added, in contradistinction to one that is to be taken away.

AFFIRMATIVE SIGH, or POSITIVE SIGH, in Alg., the sign of addition, marked +, meaning plue, or more. The early writers on algebra used the Latin word plue, or the Italian più, to signify addition, and afterwards the letter p, as an initial or abbreviation.

## Affix

AFFIX, df-fix (Lat. af, for ad, to, and figo, I fix), in Gram., a term applied to a syllable added to the end of a word, by which its form and signification are altered; as, wealth, wealth-y; odd, odd-by.
AFFLATUS, df-fixi-bus (Lat., in a ffigurative sense, inspiration, enthusiasm), a term which, among the



AFFRONTÉ.

ancients, denoted the supposed inspiration of particular persons, such as poets.

APPRONTE, af-fronte (Lat. af, for ad, to, and from, face). In Her., a term applied to animals facing each other on an escutcheon.

AFORE, a-for (Ang.-Sax.) in Mar., denotes that part of the vessel which lies forward, or adjacent to the stem

A FORTIORI, for-ti-o'-re in Log., is a term employed in a chain of reasoning, to denote that what follows is a more powerful argument than that which has already been addaced.

AFRICAM ASSOCIATION, a Society formed in London, in 1788, for the purpose of offering encouragement to

travellers and scientific men to explore the interior of Africa, to introduce the arts of civilization among the natives, and to study their character and habits. first person thus commissioned was Mr. John Ledyard, arss person unus commissioned was Mr. John Ledyard, who died at Cairo, while preparing for his journey, in 1758. His successor was Mr. Lucas, who, in his turn, was succeeded by Major Houghton, who died, it was said, a violent death, in September, 1791. The celebrated Mungo Park was the next person engaged by the association. Two Germaus, named respectively Horneman and Roeutzen, were subsequently sent out; the association. and the last missionary was John Louis Burckhardt, who died at Cairo in 1817. During the period of the active labours of the association, a large amount of information connected with the resources and geography of Africa was collected. In 1831 the association was incorporated with the Royal Geographical

APRICAN COMPANY, in Com., a society of merchants abilities of the reign of Charles II., for trading to Africa, and incorporated by the act 23 Geo. II. c. 31, 1754. When the expenses of the company had to be defrayed out of the public purse, its charter was recalled by parliament (1 & 2 Geo. IV. c. 28, 1821), and the possessions of the company were annexed to

APRICAT TRAM, the timber of the Oldfieldia africana, the handle have the Alberta Tram, the timber of the Oldfieldia africana, the handle handl

a tree belonging to the natural order Euphorbiacea. It is exceedingly strong and durable.

AFT. (See MART.)
AFTED DAME, of the damp, the familiar term for the sufficient gas, consisting chiefly of carbonic acid, which remains in a coal-mine after an explosion of

"fire-damp." (See FIRE-DAMP.)

AFTERMATH, iff-ter-math, in Agr., the grass which grows after the hay has been mowed and made. It is grows after the hay has been mowed and made. It is also called rowen, rowett, latter-math, and, when left long upon the land, fogg. When made into hay, it is inferior to the first crop, and is considered less injurious to sheep or cows than to horses.

AGA, or AGEA, a'-ga, a title borne among the Turks by military commanders; also by the superior officers of the seraglio.

of the seragio.

AGALMATOLITS, a-gall-ma-to-lite (Gr. agalma, statue, lithos, stone), in Min., a white, translucid, waxy-looking mineral, commonly known as figure-stone, brought from China, carved into little grotesque figures. It is usually delicately tinted with pink, grey, yellow, or green, and can be easily out and modelled with a sharp instrument. It resembles coapstone, but it may be distinguished from that mineral by the ways of magazin. St it consists anothy of sillon with the ways of magazin. by the want of magnesia, as it consists solely of silica and alumina, with a little carbonate of lime and potash.

## Agaricus

AGAMI, or GOLD-BREASTED TRUMPFERS, o-ga'-me, Peophia crepitane. A bird about the size of a phesessat or large fewl, with long neck and legs, but a short tail. It is found in numerous flocks in South America; can run swiftly, and, when pursued, trusts less to its wings than to its legs. In its domesticated state, the again is so fond, faithful, and jealous, that it will attack the dogs and other snimals who venture near its master to share his careses.

share his caresses.

AGAMA, or AGAMDE, a-gal-ma, a fam. of Samrian reptiles. Charac. Short, broad, flat heads, and thick depressed bodies, enveloped in a loose skin, which is capable of being distended with air at the will of the animal. Different species of Agamids are found in Asia, Africa, Australia, and America. Some species can change the colours of their skin, which causes the natives of South America to call them chameleons. natives of South America to call them chameleous. They are of diminutive size, and generally lurk among rocks, heaps of stones, and mouldering ruins. Some of the more active kinds, however, climb tress, play among the branches, and feed upon insects and other small animals. One tribe, found in India, is said to be herbivorous. The Frilled Agams, a native of Australia, is a very extraordinary looking saimal. Around its neck, and covering its shoulders, it carries a frill which, on the approach of dancer, is elevated. a frill, which, on the approach of danger, is elevated.

a frill, which, on the approach of danger, is elevated.

AGANOUS, äg'-ä-mous (Gr.), is a term used by some writers instead of cryptogamic. It is principally confined to Confervæ, lichens, fangi, and similar groups. They are said to have no functions analogous to sexes.

AGAPR, äg'-ä-pe (Gr. love), in Eocl. Hist., the love-feast or feast of charity, practised among the primitive Christians, at which time a liberal contribution was made by the rich to feed the poor. St. Chrysostom derives this feast from the apostolical practice. He says, the first Christians had all things in common, as we read in the Acts of the Apostles; but when that equality of possession ceased, as it did even in the apostles' time, the agape or love-feast was substituted for it. Upon certain days, after partaking of the Lord's Supper, they met at a common feast, the rich bringing provisions, and the poor, who had nothing, being invited. During the first three centuries these feasts were held without scandal; but later the heathens were held without scandal; but later the heathens began to tax them with impurity. The kiss of charity, which used to terminate the ceremony, was forbidden. In consequence of the abuses which had arisen, these feasts were abolished by the Council of Carthage, in the year 397.

AGAPARTRUS, ag-a-pan'-thus (Gr. agape, love, anthos, flower), in Bot., plants belonging to a genue of the natural ord. Liliacea. The typical species is Aga-

natural ord. Liliacez. The typical species is Agapanthus umbellatus, the African blue lily, a native of
the Cape of Good Hope, whence it was brought to
Holland, and, in 1693, it was cultivated at Hampton
Court. It is now a favourite garden-plant. It grows
nearly a yard high, and, in July, bears a handsome
bunch of blue flowers, which have no seent.
AGAPERONE, ig-e-pem-o-ne (Gr. agape, love, and
mone, abode), the abode of love or charity, the name
of an institution at Charlinch, near Taunton, founded
in 1846, by Henry James Prince, formerly a clergyman of the church of England. Mr. Prince succeded in inducing several ladies of fortune to adopt
his views, three of whom were afterwards married to
three of his disciples. In 1850 there were between 50. three of his disciples. In 1850 there were between 50 urree of ms disciples. In 1850 there were between 50 and 60 persons, male and female, living in community at this establishment. One of their leading tenets is community of goods, and they evidently have a goodly share of the good things of this life. The public have obtained occasional glumpess into the internal management of this "abode of love," in consequence of legal proceedings that have on several occasions been adopted against it.

AGAPTER, & donore-lee (Gr. anane. love). in Ecc. Hist.

AGREER, d-ga-pe'-lee (Gr. agape, love), in Ecc. Hist., was a name given to certain virgins and widows in the ancient church, who associated themselves with, and attended on, ecclesiastics out of motives of piety and benevolence. The scandal which this gave rise to

benevolence. The scandal which this gave rise to against the Church led to its suppression.

AGAR-AGAR, dy'-ar-dy'-ar, a name sometimes given to the alga commonly known as Ceylon moss, used for making jellies. (See GRACHABLA.)

AGARICUS, a-gdr-i-kus (Gr. agarikon, a fungus), in Bot., the mushroom, a genus of fungi, characterized by

the pileus, or cap, being distinct from the stalk, and having, on the under side, numerous flakes or gills radiating from the centre. The genus comprehends an immense number of species, many of which are edible. These fungi grow in wet and shady places in fields and woods, and on hotbeds prepared for their cultivation. The species of Agaricus commonly estern in this country are Agaricus commonly estern in this country. The species of Agericus commonly esten in this country are Agericus compestris, the common mushroom, and several cultivated varieties of the same; A. arcensis, A. Georgii, and A. oreades. The last is the Champignon, which is highly esteemed for its savoury qualities. Many genera of fingi allied to the one under consideration include edible species, which are extensively used for food in this and other parts of the world. Dr. Badham enumerates no less than thirty fungi, natives of Britain, which are eaten by himself and his friends; and complains of the prejudice existing against several species which might form dainty and nutritious articles of food. However this may be, fatal cases of noisoning of food. However this may be, fatal cases of noisoning of food. However this may be, fatal cases of poisoning by fungi are not uncommon, and great care should be taken to ascertain whether a fungus is or is not poison-ous, before introducing it into the market as a wholesome vegetable. There are no certain characters by which the edible and poisonous species may always be distinguished; but there are some general characters which help us to separate the two groups. Professor Bentley has tabulated these general characters as follows:—

Edible Mushrooms.

Grow solitary, in dry airy places.
 Generally white or brownish.

3. Have a compact brittle flesh,

4. Do not change colour, when cut, by the action of the air.

5. Juice watery.
6. Odour agreeable.
7. Taste not bitter, acrid, salt, or astringent.

Poisonous Mushrooms.

1. Grow in clusters, in woods and dark damp places.

2. Usually with bright colours.

3. Flesh tough, soft, and water

Acquire a brown, green, or blue tint, when cut and exposed to the air.

5. Juice often milky.

Odour commonly powerful and disagreeable.
 Have an acrid, astringent, acid, salt, or bitter

Professor Bentley suggests that we should avoid all fungi which insects will not touch, and those which have scales or spots on their surface; and, further, that whatever may be the apparent qualities of the fungi, we should use with caution all which have arrived at their full development, or when they exhibit have a processing doubtful fungi out ampin, we should use with caution all which have arrived at their full development, or when they exhibit any signs of change. By soaking doubtful fingi, cut into slices, for about an hour in vinegar, and afterwards washing them in boiling water, we get rid of any poisonous principles they may possess, and the process will not spoil them for the table. The edible fungi not included in this genus, such as the morel and the truffle, and also the most poisonous fungi, are described under the names of the genera to which they belong the truffle, and also the most poisonous fungi, are described under the names of the genera to which they belong the truffle, and also the most poisonous fungi, are described under the names of the genera to which they belong the truffle, and sport of the subterranean mycelium or spawn of some agaries develops in a radiating manner, give rise to the circles of luxuriant grass which country, give rise to the circles of luxuriant grass which country folks designate "fairy rings." Certain members of this great family give out a sort of phosphorescent light. The so-called aparies used for making German tinder, and other kinds of amudou which are employed in surgery, are now regarded as species of a distinct genus. (See POLYPOURS.)—Ref. Bentley's Manual of Botany.

Agara, dg-at (Gr. achates), in Min., a semi-pellucid, variegated, and uncrystallized variety of quartz, named after Achates.

AGATS, dg'-dt (Gr. achates), in Min., a semi-pellucid, rariegated, and uncrystallized variety of quartz, named after Achates, a river in Sicily, whence the Greeks are said to have first procured it. Chemically, it consists almost entirely of silica, coloured by metallic oxides. The colours of agate are generally arranged in parallel or concentric bands, but sometimes form spots, clouds, and moss-like stains. These colours are possessed by billing the stone in oil, and afterwards in suphuric acid, and by other ingenious but fraudulent processes which have been fiftieth year; when the power of procreation usually and afterwards in suphuric acid, and by other ingenious but fraudulent processes which have been fiftieth year; the sixth period extends to the seventh or eighth year, when the soom dentition is commonly over; the third extends to the ago of puberty, which varies in different the second dentition is commonly over; the third extends to the ago of puberty, which varies in different the second dentition is commonly over; the third extends to the ago of puberty, which varies in different the second dentition is commonly over; the third extends to the ago of puberty, which varies in different the second dentition is commonly over; the third extends to the ago of puberty, which varies in different the second dentition is commonly over; the third extends to the end of the seventh or eighth year, when the second dentition is commonly over; the third extends to the ago of puberty, which varies in different extends to the end of the second dentition is commonly over; the third extends to the end of the seventh or eighth year, when the second dentition is commonly over; the third extends to the end of the seventh or eighth year, when the second dentition is commonly over; the third extends to the end of the second dentition is commonly over; the third extends to the end of plustry, which varies in different extends to the end of plustry, which varies in different extends to the end of plustry.

devised by the lapidary. Agates occur, in nature as rounded pebbles, and are brought into this country from Oberstein, in Saxony, from Arabia, and India; some varieties, however, are found in Perthabire and other parts of Socialand. The Socioth pebble, or fortification agate, so called from its zigzag pattern, is one of these varieties. Agates take a high polish, and their besutiful colours adapt them for many ornamental purposes. They are cut into brooches, seals, bracelets, and similar objects, and are largely employed for mossic work. In the useful arts, agates are employed for mossic work. In the useful arts, agates are employed for mossic work, when sufficiently large, they are made into mortars for chemical purposes. The moss agate, or Mocha-atone, is curiously marked with figures resembling growing tutts of moss. These markings were, until quite recently, supposed to be produced by vegetable structures imbedded in the stone; but Professor Göppert has proved that they are merely deposits of oxide of iron.

Agathod mon, id-a-tho-de-mon (Gr. agathos, good,

are merely deposits of oxide of iron.

AGATHODEMON, dg-a-tho-de'-mon (Gr. agathos, good, and daimon, a spirit). (See DEMON.)

AGATHOPHYLLUM, dg'-a-tho-fle'-mon (Gr. agathos, good, and daimon, a spirit). (See DEMON.)

AGATHOPHYLLUM, dg'-a-tho-fle'-lum, in Bot., a genus of plants in the natural order Lauracee. The species A. aromaticum yields the Ravensara nut, or clove nutmeg of Madagascar; used as a spice.

AGATE, d-gaiv' (Gr. agauos, admirable), in Bot., a genus of monocotyledonous plants of the Amaryllis order, or Amaryllidacee. The typical species is Agare americana, the American aloe or maguey. This plant is cultivated by the Mexicans, who obtain from it a favourite drink, called pulque, octli, or agave wine. The plant is of slow growth; but when fully developed, its leaves, which spring directly from the ground, attain a height of from five to sight feet. From the midst of the great cluster of leaves a flower-atem arises, and from this numerous flower-bearing branches spring, so that the whole plant has somewhat the spring, so that the whole plant has somewhat the appearance of a candelabrum. It was formerly erroappearance of a cancelarum. It was formerly erroneously supposed that the agave lived a hundred years
before flowering; hence it was frequently called the
hundred years plant. It really flowers only once in
about ten years, and the planter has to wait patiently
for the flowering season to obtain a supply of pulque,
as this liquor is formed from the juice contained in the
young flower-stalk. As soon as this organ makes its
appearance the planter packet deep ref. in it. young hower-stank. As soon as this organ makes its appearance, the planter makes a deep cut in it, and socops out the whole heart or middle part, leaving nothing but the outside rind. A natural basin, about two feet in depth, is thus formed, and into this basin, the sap which was intended to feed the shoot flows so rapidly, that it is necessary to remove it twice, and rapidly, that it is necessary to remove it twice, and sometimes these times a day. To make this more easy, the leaves on one side of the basin are cut away. This sap, before it is fermented, has a very sweet taste, and is called aquamiel, or honey-water. It ferments spontaneously, and forms the pulque, which is a refreshing, slightly-intoxicating drink, which has a pleasant acid taste, but a very disagreeable odour. From pulque an ardent spirit is distilled, which is known by the name of mexical, or, less commonly. known by the name of mexical, or, less commonly, aguardients de maguey. From the leaves of this and

aguardiente de maguey. From the leaves of this and other species of the agave genus, the useful fibre called aloc-fibre, pita, or pité hemp, is obtained.

Acs. ai; (Fr. aga), in Physiol. During the progress of life from infancy to manhood, and from manhood to old age, the body undergoes certain marked changes, which distinguish the different periods or stages of life. These are usually denominated ages, and are properly seven in number, though some make them fewer. They are—1. Infancy; 2. chiddhood; 3. boyhood or girlhood; 4. adolescence; 5. manhood or womanhood; 6. age; 7. old age. The first age commences at birth, and extends to the end of the second year, by which time the first dentition is generally completed; the second extends to the end of the seventh or eighth year, when the second dentition is commonly over; the third extends to the end of puberty, which waries in different extends to the ege of puberty, which waries in different extens to the end of the seventh or eigner year, man-the second dentition is commonly over; the third extends to the age of puberty, which varies in different countries, but with us is from twelve to fourteen in the female, and from fourteen to sixteen in the male; the fourth extends to about the twentieth year in the female and the twenty-fourth in the male; the fifth

third year, when the seventh and last period of life

third year, when the seventh and leav period of life commences.

Acts, in Law, is that time when persons are enabled to do what for want of years they are prohibited doing, or to become responsible for their acts. The age of legal capacity is twenty-one; but it arrives for some purposes much earlier. In orininal cases a person of the age of fourteen years may be capitally punished for any capital offence, but not under the age of seven. At twelve a male may take the oath of allegiance; at fourteen he is at years of discretion, and may enterinto a binding marriage, or consent or disagree to one contracted before, or choose a guardian. A female at twelve is at maturity for those purposes. An infant above fourteen is liable to suffer for a breach of the perice, inct, battery, or the like, and for perjury or chebting. A tenant of gavelkind lands, in parts of Kent, is of sufficient age to aliene his eatste by feoffment at the age of fifteen. The law presumes a child at fourteen to be a competent winess; but if under that age, if it be aware of the nature of an oath, its evidence will be received. No one under twenty-one can serve as a member of parliament, be ordained a priest, or be admitted to practise as an attorney, solican serve as a member of parlament, be organized a priest, or be admitted to practical as an attorney, soli-citor, proctor, or notary public. A bishop cannot be consecrated before thirty. A contract of an infant may be ratified on attaining the age of twenty-one. Full age in male or female is twenty-one years, which age is completed on the day preceding the anniversary of a person's birth, who, till that time, is an infant, and so styled in law.—Ref. 1 Co. Litt. 78; 1 Bl. Com. 462. (See INFANTS.)

-It has been stated that the dura-AGE OF ANTICALS. tion of an animal's life is generally seven or eight times longer than the period it takes to arrive at its full growth, a rule that applies moderately well to domestic animals, such as dogs, horses, sheep, ozen, and even elephants and camels, but is not applicable to man, or to the majority of quadrupeds, fishes, birds, or reptiles. The age of the horse may be calculated by an examination of the incisive teeth or nippers; but at ten years old these marks are lost, and no accurate calcula-tion can be arrived at. Deer shed their horns every year, and, in the males of some species, each year adds a branch to the horns, until a certain size is attained. In sheep, oxen, antelopes, and goats, a ring is annually added to the base of the horn up to a certain age. There are no certain indications by which the durat There are no certain indicatons by which the cutaton of life of birds, fishes, and reptiles can be ascertained. The Indians assert that the clephant lives 300 years, Dogs live from 12 to 14 years, sheep 8 or 9, oxen about 20, horses, if well treated, from 25 to 30, camels from 40 to 50. Eagles have lived more than a century, and many instances are recorded of raveys having exceeded that period. Swans, also, have been known to live 100 years, parrots 60 and 80; pheasants and domestic poultry seldom reach more than 12 or 15 years. Among that, the carp has been known to live 200 years. A more trout have been confined in a well for 30 and 50 years. A pike has been known to exist in a pond 90 years. A story is related of one caught in a lake near Hallerm, in Susbia, which had attained the age of 267 years. Of reptiles, the torteles is said to be the longest lived; but this may be doubtful, as nothing is known of the duration of life of the various tribes of serpents. Of the ages of insects but little is known. The life of the caterpillar orgrub, in its first period, extends to several months; but after the attainment of their perfect form, they live but a few days or weeks. As a general law of many instances are recorded of raveys having exceeded they live but a few days or weeks. As a general law of nature, early maturity indicates shortness of life. Aca or term Moora, a term signifying the number of days chapsed since the last new moon.

number of someontric rings, each of which, in exogenous trees, marks a year's growth. The oriental plane, the bashab, and the chestaut, are calculated to live during several thousand years. Yews, in some cases, are calculated to be flourishing at the age of from 1,500 to 2,000 years. Oaks are reputed to attain, under favourable conditions, the age of 1,200 years. On Mount Eins there are three famous awest-chestant trees, which measure reproducts 150 fact 20 four Mount Eins there are three famous sweet-chestnut trees, which measure respectively 180 feet, 70 feet, and 64 feet in discountiarance, and are and to be as old as 5,000 years. In the valley of Boynkdere, near Constantinople, there is an oriental plane-tree measuring 180 feet in circumference, which is held to be at least 5,000 years old. Upon the Mount of Olives, at Jerualem, there are eight olive-trees, which were flourishing when the Turks took Jerusslem, 800 years since. At Fountains abbey, in Torkshire, there grows a yew-tree which is reported to have attained a green old age when the abbey was built, viz., in the year 1132. Near Staines there is a yew-tree older than the meeting of the English barons at Runnymede, in 1215, the date of the signature of Magna Charts. Wallace's oak, at Ellersley, near Paisley, in Scotland, is held to be upwards of 700 years old, and it is still flourishing. The following is a list of the ages to which certain trees may attain may attain :

Palm, 200—300 years. Elm, 355. Cypress, 388. Ivy, 449. Maple, 516. Larch, 263—578. Chestnut, 360—626. Oranges, Lemona, &c., 400, 509, 640. Plane, 720. Cedar, 200-800. Walnut, 900. Walnut, 900.
Lims, 364, 530, 800, 825, 1,076.
Spruce, 1,270.
Oak, 600, 800, 880, 1,000, 1,600.
Olive, 700, 1,000, 2,000.
Yew, 1,214, 1,466, 2,588, 2,880.
Baobab, 6,000.
Dragon-tree, 6,000.
GEMOGLANS, a-jew-o-gläns, s

AGENGLINS, a -jem-o-gläns, a term applied to those children of the Christians who were taken by the Turks at the end of efery three years by way of tribute. These children were instructed in the Mahome-

bute. These children were instructed in the manufacture religion, and trained to be janizaries.

AGENDA, ai-fen'-da (Lat., things to be done), a term applied in the Roman Catholic church to certain for example,—Agenda matutina omces or services, as, for example, " years managed to the perfiting, morning and evening prayers; Agenda dies, the office of the day; Agenda mortuorum, the service for the dead, &c. Agenda was likewise applied to the volume containing the risual or church service of the Romish church.

AORNA, in Com., a term signifying a pocket or memorandim-book, in which a merchant sets down what is to be done during the day. The name has likewise been given to a pocket almanso.

linewise been given to a pooter aimana.

Agrantiza, "j-j-a-line (Ang. Sar.), in the old writers, signified a guest who had ledged at the same inn for three consecutive nights, after which time he was considered one of the family, and the host became answerable for him if he committed any offences

against the king's peace.

Agans, as in other matters, is one who conducts the affairs, or is intrusted with the commission of another. AGE OF THE MOON, a term signifying the number of days chapted since the last new moon.

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He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment or by implication of law, arising from the circumstances in which the commission of another. He may be constituted either by express appointment must be in writing:

To grant a lesse of land for above three years AGENT, in Dip., a general term applied to several ranks, as envoys extraordinary, and ministors planipo-tentiary, ambassadors, ministors resident, charges d'affaires, secretaries of legation, &c. In ordinary language, the principal representative of one power at the nourt of another is termed the agent of that power at that particular court.

the wonth of another is techned the seast of that power at that particular court.

Agan, at ger (Lat., a field), a term in use among the ancient Romans to signify a portion of hand shotted to each citizen. The writers of the Middle Ages employed the word ager to denote an acre of land.

Agas of the Word.—By the Greek and Roman poets the history of the world was divided into four periods or ages, which they termed the Golden, Silver, Brazen, and Iron ages. In the first, or golden age, Saturn reigned in heaven, the earth yielded her fruits apout anought, and men lived in a state of perfect innocence and happiness. When faturn was expelled from heaven, the silver age commenced; men then began to theviate from the paths of virtue, and, in consequence, their lives were less happy. The brazen age was marked by a still further deviation from virtue, and was succeeded by the iron age, which now exists, when the stubborn earth demands cultivation, and sin and misery prevail. The history of the world is sometimes divided into three great epochs, or ages;—1. The age of the law of nature, from Adam to Moses; 2, the age of the Jewish law, from Moses to Christ; and 3, the age of grace, from Christ to the present time. Agglutinantiantial and the continuation of agercal applications as tend to unite parts which have too little adhesion.

Aggregate Frutte, age grace, from Bot., fruits formed by the combination of agercal dowers, as the pineapole by the combination of agercal dowers, as the pineapole

AGEBEATE FRUITS, & g. gre-gail, in Bot., fruits formed by the combination of several flowers, as the pineapple and the nulberry. The term anthocarpane is more generally used. Some botanists apply the term aggregenerally used. Some botanists apply the term aggregate to a compound fruit, consisting of numerous achienis, borne by a single flower; as the fruit of the ranunculus or the raspberry.

AGIO, \$\frac{\psi}{2} \dots \dots\$ (com, a term used to express the difference between the value of metallic and paper

money in a country, or between the metallic moneys of different countries.

of different countries.

AGISTMENT, d-jiet-ment (old Fr., liceuse for cattle),
a legal term implying the pasturing of a person's
cattle in the royal forests. It is also applied to the
tax paid for such pasturing.

AGLAIA, dg-lai-u, in Ask., one of the group of small
planets revolving between Jupiter and Mars. (See

planets revolving between Jupiter and Mars. (cee Asteroids.)
Ackala, dg-las'-a, in Bot., a genus of dicotyledonous plants, order Maliacem. The flowers of Aglaia advorate are used for perfuming certain varieties of tea.

Ackall, dg-nes'-fi (Lat. nascor, natus [originally gnatus], born to), the relations by the father, who, by the Resman law, were preferred to the cognati, or relations by the mother, till the edict of the emperor Justinian (Nov. 118) abolished all distinctions between them. The conata, or relatives ar parte paternal, are

### Agreement

Roman Catholic church, is the name of a prayer in the Mess, introduced by Bergius I. in 688, and beginning with the words Ayasa Dei. It is also the name of a hymn commencing with these words, sung at the elevation of the Host. Agains Dei is likewise the name given to a round piece of wax, stamped with the figure of a kimb, supporting the banner of the cross. These are consecrated by the pope, and distributed among the people, and are supposed to possess great virtues. Acoustil, do-one; time, festivals celebrated by the Romans in honour of Janus. (See vol. I. of this work.) work.)

work.)
AGONISTABUR, dg-o-mis'-tark (Gr. agonistes, a combatant, and archos, the chief), the superintendent or president of the sacred games, who exercised authority over the sthlets, inspected their discipline, and syarfed the prizes to the victors. In the Olympic, Pythiansand other great public games, these presidents represented different states, or were chosen by and from the people in whose country the games were celebrated.

Agourt, 4-post-te, in Zool., the Chlorenge of Cuvier, the Dasyprocts of Ilinger, a genus of animals belonging to the class Mammalia, ord. Rodenta, and fam. Hystricides. Charac. Toes armed with long and very strong

to the class Mammalia, ord. Rodentia, and fam. Hystricide. Charac. Toes armed with long and very strong claws, and completely separate from each other; hind legs very much longer than the fore; head large, forehead and face convex; eyes full and black; ears short, round, and almost entirely denuded of hair; hair for the most part coarse and bristly, but in some species nearly as fine as the fur of the rabbit; twenty teeth. At the first settling of the West-India islands they were very numerous, and were an article of constant consumption by the Indians; but the planters, finding them too destructive to the sugar-canes, of the roots of which they are extremely fond, have destroyed them in great numbers. Whilst eating, these animals sit or which they are extremely fond, have destroyed them in great numbers. Whilst eating, these animals sit upon their hind quarters, and hold their food between their fore-para. They are exceedingly voracious, and, when they have satisfied their appetite, will hide the remainder of their food for another meal. They live remainder of their about it when timber, are very prolife, and produce young more than once a year. Their flesh is good cating, and they hold in S. America the same place as the hare or rabbit in Europe. There

desh is good eating, and they hold in S. America the same place as the hare or rabbit in Europe. There are seven perfectly ascertained species; viz., the common agouti (Dasyprocta Aguil), known also by the hlack or created agouti (Dasyprocta cristatus), sometimes termed the black or created agouti, the acouchy, or olive agouti (Dasyprocta crossed agouti; the acouchy, or olive agouti (Dasyprocta Acuchi); the White-toothed agouti (Dasyprocta crossed.a); the Dasyprocta grymmolopha; segouti. Hab The hotter parts of S. America, the West-India islands, and Guiana.

AGRARILER LAW, al-gradi-ri-ms (Int. agrarid les), a Roman law for the distribution of lands emong the common people. The object was only the distribution of lands which were the property of the state; first, to have a protection against the mouraions of an enemy; thirdly, to augment their population; fourthy, to free the city of Rome from an excess of inhabitants; lifthly, to quiet seditions; and, stitlly, to reward their veteran soldiers. It contained version provisions: it described the land which was to be divided, and the classes of people among whom, and their numbers; and by whom, and their numbers; and by whom, and their numbers; and by whom, and the territory was to be parcelled out.

AGRERMENT, a greenent (Fr. agreen, in Inw. is where a promise in made on one side. and assented to where a promise in made on one side.

relations by the mother, thit he educt of the emperor it described the land which was to be divided, and the Justinian (Nov. 118) abolished all distinctions between preferred in descents to the cognati, or relatives are parter paternal, are preferred in descents to the cognati, or relatives are parter paternal, and by what preferred in descents to the cognati, or relatives are parter maternal, which agrees with the laws of the Hebrews and Athenians; though among the Greeks, in the time of Hesiod, when a man died without wife or children, all kie kindred, without any distinction, divided his estate emorget them. The Balgish law is conformable to the castemary law of ancient Normandy.—Ref. I Bit. Com. b. 2, pt. 1. ch. xi., and the authorities there nied.

AGROMEN, 13 and 16 to conform promote in the collection of the constance in his life. It was the fourth in order of the conformation to a person on account of some distinguishing circumstance in his life. It was the fourth in order of the conformation of the class; and the conformation of the class and the conformation of the cl

Agricultural Chemistry

ages out of his own estate. 2. Where a man undertakes to answer for the debt, default, or miscarriage of another. 3. Where any accessible is made used of another. 3. Where any accessible is made used of another. 3. Where any accessible is made of lands, tensments, of invisionments. 5. Where there is an agreement that is not be an execution in the second of the second at the time of execution, his same and the date; such cancelling to be a necessary part of the evidence of the agreement. An agreement under soal requires the same stamp as a deed. If there are letters to prove an agreement, it will be sufficient, if one of them be stamped with a suffling duty. An agreement chargeable with the duty of superies may be stamped within fourteen days after date, without penalty; after that period, on payment of a penalty of 20s., if the value of the institute be under 200, or 210 is shove. A deed or instrument unstamped or insufficiently stamped may be given in evidence, on payment to the officer of the court of the amount of duty required, and the penalties (if any), together with an additional penalty of 21. (See Courseave. . (See Cremister as Applied to Agreements.)

A GRICULTURAL CHEMISTEY. (See CHEMISTEY AS APPLIED TO AGRICULTURAL)

ACRICULTURAL INTERMENTS are the instruments used in tilinge and the venous operations necessary for the proper cultivation of the soil comprising implements for harvesting, stock-leeding, land-draining, propagations formarket, the application of steam-power to agriculture, &c. (See Ploude, Harrow, Boller, Clod-Churges, Bowing, Dieble, Drill, Torderser, Madries, Bowing, Diebles, Drill, Torderser, Madries, Bowing, Theretailuros, Hos-Bearing, Manney, Hoses-Raire, Theretails-Modelies, Wilmowing, And Dressing Manney, Turnis-Cutter, Charles, Drinter, &c.)

Acanophymical Societies, Institutions, Scotteries

MUNIOUSE AND DESSRING MEDINER, TURNITE CUTTER, CHAPP-CUTTER, DEALNING, &c.)

AGRICULTURER SOCIECTES, INSTITUTIONS, SOCIETIES FOR THE PROMOTERS OF ARRICULTURE.—The Improvement of every presents of knowledge in agriculture has been largely developed by the establishment of agricultural societies. The Beard of Agriculture, which owed its mistrates to the exertions of Ser John Sinclair, was indicated an attended and the Smith and West of England Society published its. "Reseasettons" before that time. The celebrated Royal Agricultural Society of England Society published its. "Reseasettons" before that time. The celebrated Royal Agricultural Society of England was satisfied and the Set and West of England was satisfied in 1859, and reseived its charter of incorporation in 1868, and reseived in the seculity of the international sequences of the mistorial sequences and the mistorials were established to 1.104. Its first meeting was held to the reversal of emission saccondations associately and to the formation of new ones. In the United Emission there are 450 lead agricultural societies, some of which hold memoral provision of account of the parison county. The Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of Agriculture, in Society of Improvers in the Knowledge of A

land was established in 1841. Abroad, various meti-tations here been designed for the improvement of agriculture; and at Mahetheim, are miles from Stati-gall, as Jolf palace has been converted nin an agrecu-stral sellings. In Revents, a model farm is attached to the rotal palace of Schloushosma, and in terminal minimum schools.

Association of the selling that the case of the

is the point primer of Schuczkonkern; and in twenty interpreta Singuistics there are not less than 362 agricultural primers. In the primer of the state of the st

marsh," says he, "formed by the depositions of the Nile, the principal parts of Upper Reyrle was a valley, several miles broad, bounded by mountains, and, on both sudes, declining to the river. Hence it was overflowed only for a certain time and assaon, the waters rapidly declined, and the ground, earliched by the mud, was soon dry, and in a state it to receive seed. The process of cultivation in this country was also most obvious and natural; for the ground, being every year covered with mind brought by the Nile, and plants spanning up apontaneously after its recess, must have given the bint that nothing most was necessary than to scatter the seeds, and they would vegetate. Secondly, the ground was prepared by nature for receiving the seed, and required only stature for receiving the seed, and required only stature for receiving the seed, and required only stature for making he sand, which he prepared and cleared from plants, and, secondly, that the maxime of rich mould and sand would produce facility. What is here stated may appear without familiation as to Typer Reyre to because, at present, in the staining of Theber, water is raised by are, Sut this objection is elected by the testiment of Dr. Formick, who is suphism that formestly up are all the superiored in steppic, or not, is a present or serior was a first cultivated in steppic or the superiors of the soul was proposed in a general concernance of testimony, we are usade aware that the outless of the soul was any stated on sentent or the soil was because, the latter stated in the present of the superiors of the soult state and state and states, the latter stated in the superiors of the superiors of the soult state states for the superiors and states, the latter stated are constituted by occur. Of the residence of sentencial are supplied in the sides of the hills received weather, technique for the sides of the hills received weather, the latter states, and the sides of the hills received weather that the superiors for the superiors of the soult states o

with, was a kind of pick, which, by de proved into a surt of blanch. With Contr. proved into a surt of pitterned up the sail in turned up the sour our own practice is broadcast from a benchioned in our raria.); but He practised; and inditants of the eave that " no thoms. When so with a sortise, or out into the sortise and som floor in the bank. If the since floors wer ground in the open as flooring floors were ground in the open as into isheaven, and according to a series we may communicate the history. They make shade of threshing, and the charaching-linear wave, as they still into, level plots of ground in the open six. The mands of threshing, and the cantrumnate completed in it, were various, as we find by the following tamings in The lands, artiful, 27, 25. "Fitches are not dispassed with a direction with a seal, and the cummun with a rad. Bread-our is leaded, artiful, 27, 25. "Fitches are beston, out with a stall, and the cummun with a rad. Bread-our is leaded, because he will not ever he threshing it, nor break it with the wheel of his earl, not bridge it with his barremen." Of the manures employed by the Reystians, we possess bride or no knowledge; and although his said that they desputed the projection of a shapehed, yet do we find Pharach expressing a misk to sceleth to have a Jewish buillifor the supersistic of its Rades :- "If thou knowed any mak of activity among them, them make them rules over he catfile." (Cathean, xivii. 6) In reforence to the landed estates of the Egyptans, we find that they grow to be very large. Ususah, king of Judah, "had much, both in the low country and in the plans; husbandmen, also, and vine-dressers in the mountains and in Carmel, for he loved husbandry." (2 thron xivi. 10.). We also find that Job had "14,000 sheep, 6,000 causies, 1,000 roke of caca, and 1,000 she axes (400), i. 3; xis. 12. He was the greatest man in the Rast; but, in the time of Isaakh, the accumulation of landed property had risen be such an extent, that a curse was sittleted against the practice. "We must be landed for property, and risen to such an extent, that a curse was sittleted against the practice. "We unto them," says the prophet, "Ital jons house to house, that they may be placed alone in the midst of the earth." (Isaah, v. 3). For some valuable and interesting notes in connection with Scripture of the aground. Finally Bithe."]

Greek dericultions.—Of the modes of cultivation practiced by the Greeks is chiefly derived f

still is in modern of the continent, thorns and other agriculture were the cultivation; besides an and other fruits. sheep, goats, swins, house was used for facilities have have no knowledge white plants were in use. As order to clear the remarks," the men is they see occasion,

ests of the

ments which the desiration of these satists, had statisted to in the last, and these satists and the statists of in the last, and these satists with them into these own advance, and which to the general which of knowledge, "I hen they, in their sum, were conquered by other mations, her interesting the came adquainted with these knowledge, said anxied it with them into those countries in which they became permanently settled. Upon the state of agriculture among the early Romans, we have little or no information; but of its state when Rome had arried at the same of her greatest prosperity, we are in possession of ample knowledge. Cato in the shad, and Vaxro in the lat cantury provious to the Christian era; Virgil at the time of the birth of our Saviour; Pliny and Columnils but a few years subsequently; and Palladinian in the Sad or 4th century, have all entertained its with works on agriculture, and not only given as correct, but aimste minure minure and not only given as correct, but aimste writers on agriculture have been transmitted to us entire, with the exception of those or Columnils; and it is surprise on agriculture have been transmitted to us entire, with the exception of those or Columnils; and it is surprise in this art, at so remote a persod. Among the Romans it was held in the greatest esterm. Clincinnatus was the ploughman of his own four acres, and the Samnite ambasad or found Curius Dentatus inspiring his own vegetable repeat in an earthen vessel. Serval of the noblest families obtained their patronymacs from some of their ancestors who were favours for the cultivation of some spenial vegetable. Such were the Patri, Lintuit, Cicerones, &c. These were the days of Roman agricultural glor. "When they pressed a good of their ancestors who were farous for the cultivation of some special vegetable. Such were the Fabit, Lontuit, Coerones, &c. These were the days of Roman agricultural giory. "When they preased a good man," asy Cau, "they alled him an agriculturist and a good husbradman, he was shought to be very greatly honoured who was thus preased. For improving the "all they drailing manures, and the dung of animals was especially esteemed, "fixedy," for improving the "all they drailing a fatting prefix olderly asted upon, even it this country, at the present day. When in Gaul 1 of in Britam, they made ine of both line and mar! In a system of both newword and open drainage was employed to carry off this superficient waters of soils. The implements used consisted of the plough, spades, rakes, host, matteds, harrows, and such matruments as measing, or substantial and the state of the first proper as advanced in intelligence regarding the arts of the first properties with present the plough, spades, rakes, host, matted the first wo uses, and they summing was performed with two uses, and they summing was performed with two uses, and they summing was performed with two country, and they summing was a significant firstiges and sometimes not. They muchly fallowed their land every other year; and sowing was a significant formed, were aircumitances to which the Bounas agricultions with the first present in the properties of which the Bounas agricultions in the line of another process to that materials in manures within the material than the case of the translations. The crops considered is when, had, and the line, they made my by a samilar process to that materials in maderies them. flax, e the first well as by a street the sir, as well as by a street the wind. The same party makes, assert

Anatomy

acrta gives off numerous branches, which may be divided into two sets,—those which supply the viscera, and those which are distributed to the walls of the abdomen, the former comprising the colline warry which shortly divides, into the present introduction and it plents exteries). The upper anatomatical the shortly divides, into the plants, and state the capitalist. The plants is also the special interest in the capitalist of the plants are the special of the capitalist of the special problems of the special to the left divides the special which there is not the special to the left divides the special which the special currying remose blant there are first the larger of the left divides the special way, and there is no the right among the special to the left divides the special way, and differ the special of the special to the left divides the special way, and differ the special to the left divides the special to fifth lumbar vertebree, and terminates in the lower and hack part of the right sornels. The capillaries (from cogullus, a bini) are impute vesula pervaling overy part of the body, and matting the extrome points of the afterness with these of the vein). Their diameter of the Meries with the st of the vein. Their diameter arms in different parts, but is usually shouts 1, the pirt of all which at the pirt of all which are already said something at out it is absorbant system, and must refer, for further putterniars to the heads Lacric use and its menance. The Mericus Systems characters for two parts, known as the cerebro armai and the sympathetic or ganghonic systems. The desirable parts is all deals and similar of the systems of the brun and similar of the systems.

systems I he farmer meludes the brum and signal cord, with the nerve proceeding from them, and is runded as the nervous assent of animal life, the latter consists of a double chain of gaughts, running along the spinal column, whose fauctions seem to be it is chreetly commented with the mind, and thefly bearing upon the named life. The acceptage of the system is divided into the encephalon, or position contained within the oranum, and the spinal cord inclosed within the vertebral canal. The art chialon commenses the care brum, the curebellum, the pous comprises the care brun, the corobellum, the pour Vinola, and the modulis oblougate, and is covered with Varida, and the measure oblougate, and is covered with their membranes, called the dura mater (or outermost), the arabaneod membrane, and the pla mater. The substance of the encophalon sof two kilds,—a or oritious or greyish substance, called also corticle, from forming the outer part of the cerebrum and exceptioning and a white or medullary mater, forming the tion forming the outer part of the cerebrum and cerebrilium; and a white us medullary matter, forming the
imar substance of the cerebrum and cerebellum, but
the outer of the medulla oblements and pons Varcli
The orrelrum, or brain project, forms by far the
largest pertion of the enterphalic mass. Its upper
cuture is shrided into a right and left hemsphare, by
a languatinal diseare lodging the faix cerebr. The
under subject of each hemsphare is not led off into
three lobes, balled the automore, middle, and postentor
the entire surface of such hemsphare presents a num
ber of chavaluted eminences, reperatured from each
other by depressions of ensures depths. The cerebelum, or little behan, is situate beneath the lunder part
of the aerotrain, from which it is expected by the
tentorum cerebrell. It is kinement divided into two
hateral botrophirms; but its surface is not convenient,
but labinated. It is somewhed with the rest of the
eucephish masses by means of connecting-bands
called crars or pestimoles, two of which ascend to the
over the unit, we decread to the medulla oblougata, and
two units in front to form the pons Varcli. This last
occupies a coult al position pa the under surface of the
exception, and constitutes the bond of mice between
the other parts, being connected above by camp from
in crecking at the point of the seasolution,
and being in contact tellow with the created line,
and being in contact tellow with the seasolula oblougata.

This last extends from the lower services of the
form, at reach side by critical first excellent or the contact and the points of the points

the last extends from the lower services of the points.

Anatomy

Varein to the upper part of the spinal cord. It is presumated in firm, with its broad extremity directed preside, and increases about an inch and a quarter is regist. I measure a two fasters, it is divided into two laters and remained halves. The spinal cond. It is presided to the cocipital cond. It is supported to the occipital total the first the firm the remained of the occipital total the first the firm the remained of the occipital total the first the first

viscia and blood sessela

Silvecture of the sessela of the spatcamy of the various organs of sensation, separation, digestion, so, we must refer to the accounts given under their proper names in other parts of this work.

Description of the Flanks in which the Description of the Scalary is are therefore the Aratom of the Scalary is are therefore the life from Virwo or the Scalary of the Head —1 Os fronts, 2 right as parietale or in guarts, 3 squamous portion of the right os temporis a mestod process of the inferior manule, 7 cho and process of the inferior manule, 7 cho and process of the inferior manule, 9 symplemes of the inferior manule. nord process of the inferior massila; if angle of the inferior maxilla, 9 symphysis of the inferior maxilla, 10 right superior maxilla; 11. right os male or jugale, 12 left os male. The Trewar —17 Severth ocryical vertebra; 14 first trat, 15 suphth r first false rib; 16 first lumbar vertebra; 17 sacrum iv imm 1 points, 20 solution. Unrue Frans intress 21 clavicle; 22 sospula; 23 seconion, 24 conacoid process 25 lumerus, 26 greater inhercont; 27 mailir tuberosity, 28 sminesoes for the radius, 24 trochios, 39 interial condula; 25 radius; 52 tuberoi (i the radius 34 ulas, 34 sorghoid servers of the country two-rosty, 28 aminence for the radius, 20 trochlos, 40 internal roudyle; 3h radius; 32 twierry of the radius, 34 when, 34 porospoid percess of the ulus, 35 os mancountre, or employeds, 36 os lunar 17 os concioune, or triquetrum 125, os presiorne, 51 os faperium, or moltengulum mayas; 40 os rape codes, or multangulum mons, 41 os sap tatum 4 ces used terms, or hamselum, 45 sablerypal hone of the thumb, 46 metacarpal hone of the madels fixer; 48 metacarp al hone of the run-tingen; 47 metacarpal hone of the tring-tingen; 47 metacarpal hone of the thumb, 4 second phalange of the foreinger; 58 second 1 in a first phalange of the foreinger; 58 second 1 in a first phalange of the foreinger; 58 second 1 in the foreinger; 58 second 2 in the foreinger; 58 second 1 in the foreinger; 58 second 2 in the foreinger; 58 second 3 in the foreinger; 58 second 2 in the foreinger; 58 second 2 in the foreinger; 58 second 3 in the foreing

1 700

the little finger; 02. third phalange of the liftle finger; Lowen Errussings:—03. Thigh home; 64. mochanise major; 65. trochanter miner; 51. internal conducts mpjor; 65. trochanter mins 67. external condyin; 65, und 69. tibia; 70. interest condy 72. tuberosity; 78. interest, its head; 76. actorist make on palos. os caleis ; 76. orternal 81. or cuneiforms 63. os cuboideum toe : 85. metatarsal tarsal bone of the the fourth tor; 36, arctetional from at the fifth tor; 89, first phalangle of the great tor; 31, arcond phalange of the great tor; 31, first phalange of the great tor; 32, first phalange of the second tor; 32, arcted phalange of the sunnel tor; 35, third phalange of the sunnel tor; 36, first phalange of the third tor; 36, arcted phalange of the third tor; 36, arcted phalange of the fourth tor; 36, arcond phalange of the fourth tor; 36, arcond phalange of the fourth tor; 180, arcted phalange of the fourth tor; 190, first phalange of the fourth tor; 190, first phalange of the fourth tor; 191, arcted the fifth tor; 191, arcted the first tor; 191, arcted the fifth the fourth tos; 66, 3

figh tos.

Plate IV—Back View of the Biskerton, Rean1. Os parietal or frequentia; 2. forence peried; 2.
maker process of the or frequentia; 2. forence peried; 2.
maker process of the or frequentia; 3. forence peried; 2.
maker process; 3. masted of the temporal bone; 7.
metod forence; 5. masted process; 6. styloid process; 10. os cereptia; 11. lower jew. Trans.—12.
Beyonth correctly synthes; 15. twellth dread vertebra;
15. fifth hundrer synther; 15. twellth dread vertebra;
15. fifth hundrer synther; 15. is strum; 20. forence
ovale; 31. first off; 22. siglich, or first false rib; 23.
twelthe rib: Useria Expansions; 27. commion;
28. humerus; 29. greater tubercetty; 30. externat
ondyle; 31. internal condyle; 32. radius; 33. bead
of radius; 34. wins; 35. of nucleiouse or triquetrum; 30. or
37. os lunser; 38. os nucleiouse or triquetrum; 30. os
platorne; 40. se multusigulum majus; 41. os multanplatorne; 40. se multusigulum majus; 41. os multan-

14. Baror except radialis; 15. addustor politics; 10. the consecute palement 17. palmaris apopeurosis; 15. patriastic major; 18. measubs; 20. sternopolitan, or regime; 21. production 23. fascil alta; 23. the majors; 25. page 25. fair regime; 26. production 25. file rectus femorie; is it the rectus returned the sector in the kneecest 18. us; 29, extensor portion of the stemocraterologies; h. respenses; 4 deficid; 5 friespe; 3 missions common digitarum; profition of the sociation; in respect carpi radialistic period; 9. Interest carpi radialistic period; 9. Interest carpi radialistic period; 10. the general development of the resture extended; 10. the general manners; 11. the resture extentions of the principal dependent of the denote the phase territorial of the principal dependent, 13: the general manners; 12. the second of the characteristics of the principal dependent of the denote the principal dependent of the sense of the principal dependent of the sense of the country of the sense of the country of the sense of the country of the sense of the country of the sense of the sense of the sense of the country of the sense o irapezius ; 4. is digitorum ; masted forming : 3. masted process; 9. styloid process; 10. on Scapital; 31. lower jaw. The rest.—12. Seventh operating verticars; 13. welful decay overtern; 15. fifth insides forming; 13. secrom; 14. on comparing the forming of the forming vertical; 13. the control of the forming vertical; 14. secrom; 14. on comparing the forming vertical of the secretary of the vertical of the decay of the vertical of the decay of the vertical of the vertic

wards when the knee is semi-fixed. The gastrocuemics muscle is the most superficial of the posterior tibio-

warm when the knee is sum-inted. The gosterior timefibular region. It arises from the upper portion of
the two condyles of the femus, and by means of the
tendon Achilles is inserted into the lower portion of the
tuberosity of the or suders.

History.—Some landwinding of the internal structure
of the human body was doubtless obtained at a very
carly period. The suscient Exprisms are said to have
acquired great enatomical skill from their practice of,
embalming, and Heaser displays a considerable amount
of knowledge of the human body in his description of
wounds, in the "liest." Elippocrases, who flourished
about 400 years acc, is regarded as the first author
who treated anatomy as a sornice. Erasistratus, and
Herophilus of Alexandris, are considered as the lirst
that, dissected and described the human body, nearly
300 yeters are. Galen, however (a. 131 a.D.), is the
author of antiquity that displays the most intimate
knowledge of the human body; and even he evidently
the dissected a great part of his knowledge from dissections ofteness and other animals, there being a law in
Rome subth forbacke the use of dash bodies. During
the darksages, awatemy, like the other sciences, made Rome which forbade the use of dead hodies. During the dark ages, systemy, like the other sciences, made little graguess. The interest in austomy began to revice about the 13th century, and, in the beginning of the 18th, Mundinus dissented and demonstrated the different parts of the human body, at the University of Bologas, and published a work which formed the text-book in Italy for nearly 200 years. During the next 200 years, the interest in anatomy continued to increase, and, within that period, there are several respectable names is connection with it; as Gabriel de Zerbio, Achillini, Berenger, and Massa. The errors of Galen, however, still prevailed till the time of of Galen, however, still prevaled till the time of Vessius, who flourished about the middle of the 16th Vessius, who flourisized about the middle of the 18th century, and boldly, by dissections of the human body, pointed out the errors into which he had fallen. He is regarded mighle father of modern anatomy. His great work, De Corporis Humann Fabrica, was published before he was twenty-eight years of age. He gave a great impulse to human dissection; and, among his contemporaries, or immediate successors, were Falloping, Enstaching, Varoli, and Fabricius. In the 17th century the progress of anatomy was rapid. In 1619 Harvey's great discovery of the circulation of the blood was announced. Asellius, in 1627, gave out his discovery of the lacteds; and in 1651 Rudbock of the blood was announced. Ascisus, in 1827, cave out his discovery of the locteals; and in 1651 Rudbeck discovered the lymphatics. Among the other distinguished anatomists of this century were Bartholin, Peoquet, Jolyffie, Wharton, Swammerdam, Willis, Malpighi, and Enysch. In the 18th century we have many eminest names. In 1taly, which still retained a first place, were Valsalva, Santorini, and Morgagni; in France, Wisslew, Vicq d'Azvr, and Bichat the founder of General Anatomy); in Germany, Haller, Meckel, Zing, and Soemmorring; in Holland, Boernawe, Albinus, Camper, and Bonn; and in England, Cheseiden, the two Hunters, Charles Bell, and the Mources of Edmburgh. The present century has been specially characterized by the great advance made in minute or microscopic mentory. Among the names of this period may be mentioned Cloquet, Magondie, Miller, Quain, Gooder, Bewman, Todd, charper, Ellis, Wilson, Gray, and Holden. Ref. Quain's Anatomy; Gray and Holmes's Anatomy; Vade-mecons. Vade-mecum.

Vade-mecuna.
Anatona, Companativa. (See Zoologa.)
Anatona, Veggetable. (See Hotana.)
Anatona, Veggetable. (See Hotana.)
Anatona, Veggetable. (See Hotana.)
Angestole, sin season (Lat. antensaor, from onle, before, and ordo. I go), one from whom a person is descended, either on the father or mother's side, at any distance of time. All nations in any way civilized any distance of time. All nations in any way civilized respect the memory of their ancestors, and some have seen offered them religious homage. The feeling is

and his ansestors, and the other to a corporation and

and his ancestors, and the other to a corporation and their predocessers. (See Purdressors.) Archor, da'sher (Lat. anchora), an instrument of iron used by sitips to hold them to their moorings. Their quisming is searched to various persons. Anchors originally, were large stones of pieces of wood, loaded with heavy weights. The first anchors that approached the prevent abuye had hot one licke; afterwards matter was saided; but then, as appears from mon-ments, they had no

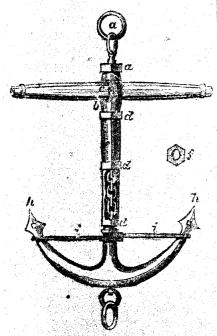


ments, they had no stock; which addi tion may be considered the last step to their present form. The technical parts of an anchor are as follows.—R, the ring; ABC, the shank; A, the small; C, the threat; B, the trend; DCFE, the arms; D, the pain, or fluke; E, the bill, or peak, or pea. The chunk is the central shaft; the small, the end of the shaft near the top; the throat, the end of the shaft near the hottom; the trend, two-thirds down the longth of the shank; the ring is at the upper end; the stock spreads out beneath the ring; the arms brunch out at the

ANCHOR. Dranch out at the other end of the shank; the palms, or futes, are the flat portions at the ends of the arms; the bill, or peak, or pea, is the extreme end of each nalm; the crown is the part farthest from the ring. Men-of-war and, very large ships carry two large anchors of equal size at the bows, hence called bower anchors; and two others of the same size, which are called the sheet and the spare anchors; besides two or three smaller ones. When the anchor is let go from the ship's bow or side, and others the water, it will generally strive at the bottom of the sea in an upright position, in consequence of the resistance of the water on the stock; it then is turned or canted over, and rests on the it then is turned or canted over, and reats on the crown, the end of the stock, and the corner of a fluke. Anchors are made of flat broad bars forged together. Mr. Pering introduced the improvement of forming the shanks of bars of equal broadth and depth. He has also invented other alterations, and it is upon his plan that anchors have lately been constructed. When one anchor is down, the vessel is said to be at single anchor: when two are used, the vessel is generally said to be moored. When the suchor is dragged by the pulling of the cable, it is said to come home; when the cable is twisted round the anchor or stock, the anchor is said to be foul; when the anchor is lifted out of the ground, it is said to be awaigh; when hore up to the surface of the sea, it is said to be awash. The weight of an anchor in mea-of-war may be roughly The weight of an anchor in men-of-war may be roughly estimated at lewt to each gun; in merchant-vessels, about I cwn to each gun; in merchant-vessels, about I cwn to each 20 tons. Within the last quarter of a century several improved forms of anchors have been introduced, the most important of which have been those of Porter, Lienti. Rodgers, Honiball, and Trotman. The most efficient eacher in use at the present time would appear to be Trotman's, which is an important form of the authorizate and in Porter. improved form of the anchor patented by Porter. In 1852 the Board of Admiralty ordered a series of experirespect the memory of their ancestors, and some have oven infered them religious homage. The feeling is on that which produces respect for the best anabors than in use. Thisse were tested in respect to the following qualities:—Strength, weight, parents. It is, however, spt to lead to error, in studing under importance to their knowledge and respectively. All the strength of these experiments was that the palm of experience. All enstern nations are proud of a long into of ancestors.

Ancestors, in Law, one who goes before in order of time, and from whom we descend by birth and lineage. The law makes a difference between an accestor and a predecessor; the one being applied to a natural person the great these areassary to weld such large masses the ments to be made with the view of testing the qualities

iron is hable to become what is technically termed In the welding of a large piece of metal like the shank of an anchor, by employing the sledge-hammer, the workmen are subjected to a scorebing heat radiating therefrom, which renders it impossible to make a very close inspection; consequently the beating up of cinders within the body of the iron frequently occurs. Of late years many attempts have been made to construct anchors which shall be free from these faults. One of the best and most charac-teristic of these inventions is that of Mr. Hawkes, who observes:—"The anchors at present in use are made by forming the shanks and flukes separately; and by the rapid action of heavy hammers they are united or wolded into each other; and the cable is fastened to a ring passed through the shank sidewise. The stocks, if of wood, are let or scored over each side and bolted and hooped over the shank of the anchor;—if of iron, the eye, or hold for it, is formed by punching a hole through the shank of the anchor; the pains are made separately and welded on the fluxes. The improvement consists in making one fluke and half the shank in one piece, and to bend them to the form required, and then hooping the two halves together. This method of making the another is separate parts admits of the forming of a groove up the middle of the shank for a chain to pass through, and of an eye of great strength for the reception of a wooden stock, which is also made in two pieces, and passed into the shank in reverse directions; these having iron shoulders abutting against the eye, are kept immorably in that posi-tion by being braced together with an iron hoop at each end. The construction is shown in the annexed engraving:— $\alpha$ , the cable ring; b, the eye which holds the stock made out of the whole substance of the



MR. RAWKES'S ANCHOR.

shank, by hending each of the helves in a semicircle in opposite directions. The suchor is shown to be divided into two equal parts by a line which passes down the middle of the shank, as at oo; o, the wooden stock, made also in two equal parts, as before discribed,

and firmly sourced in their places by the hoops and shoulders; d, d, d, d, are four strong hoops which hind the shank together,—the upper one is made square, and the others circular; a portion of the shank is supposed to be removed to exhibit the situation of the chain which passes up the centre, and is connected at the upper end with the cable ring, and at the lower end with the buoy ring; f, in the small separate figure, gives a transverse section of the shank of the anchor, showing it to be of an oval form, the longest diameter of which is in a line with the flukes; this figure conferring upon the great strength to withstand the powerful strain to which an anchor is frequently exposed in that direction; h, h, are the palms bolted to the respective fluires, each of which is connected in one piece with a brace; i, i, passing in opposite directions round the shank of the unchor, thereby strengthening the flukes in a great degree and giving a colliseral support to each half of the anchor; k is a strong plate of iron holted on the crown; l, the buoy ring.

Anchor, in Arch, an ornament ou mouldings of all the orders. It resembles an anchor, and is intermixed

Angron, in Arch., an ornament of mouldings of all the orders. It resembles an anchor, and is internated with eggs. Some writers style this moulding a tongue, from the likeness it bears to the forked tongue of a serpent. The wrought-iron ties that are placed in the walls of buildings, to prevent them separating, are also called anchors. The term is also applied to part of the collar of a lock gate.

Ancugaces, outleardy, a safe place for depositing a ship's anchor, that it may hold the ground firmly. Stiff clay and bard sand offer the best anchorages, and the best position for a ship at anchor to take, is out of the tide or in a land-locked place. The term anchorage is also applied to the dues paid by ships for easting anchor.

ANCHORITE, Nu-ko-rile (Gr. anachorea, I withdeaw or ctire), a hernit, or one who withdraws himself from seciely, in order to avoid the temptations of the world, and to devote himself to geligious daties. Tays lived in caves or desert places, and usually practized great austerities, subjecting themselves to the inclemencies of the weather without proper clothing or habitation, restricting themselves to coarse and soanly fare, maintaining painful postures, and wearing iron rings or chains. They sometimes obtained great



ANCHORITE

fame for sanctity, and were visited for their blessing, or from a belief that they possessed the power of curing diseases. Many of the early Christians had to retire to solitary and desert places, in order to avoid persecution; the order of Anchorites, however, arose in the 4th century, and Paul the Hersuit, Antony, and Hilarion, are said to have been the first. As souvents began to increase, these came generally to be preferred

organ to increase, tasse came generally to be presented as places of retreat.

Anonovy, an-tcho'-ne, or an-chose (Fr. anchois), in Ichtha, a gen. of abdominal malacopterygious fishes, comprehended by Linuaus in the Clupes, or Herrings, but separated from them by Baron Cuvier. (See

# Anchovy Pear

CLUPEIDE.) With the exception of the common anchory, they all inhabit the tropical seas of America and India. The common anchory is found Atlantic, along the shores of France and Portugal. It is sometimes taken off the coasts of Holland and England; but



is abundant in the Mediterrancan, where off the island Gorgona, of to the west of Leghorn, it is very plentiful. The months of May, June,

ANCHOYE. and July are the shores of the Mediterranean, which they enter in immense shoals by the Straus of Gibraltar. The Romans compounded from them a favourite sauce, which they termed garum. In modern times, the an-chovy is also regarded as an appetizing morsel in the form of pastes, &c. Charac. Colour, bluish-brown on the back, and silvery white on the belly; and fin short. and the dorsal placed immediately above the ventral Size, about three inches.—For Anchovy recipes, see Mrs. Beeton's Household Management.

Anchovy Pear. (See Grits).
Anchovy Pear. (See Grits).
Anchovy Pear. (See Grits).
Anchovy Dearth of plants belonging to the nat. ord. Boraginacco. The cutyx is divided into five segments; the corolla is funnel-shaped, the mouth of the tube being closed with five scales; the stamens are five in number; the stigma is obtuse and the achievia, which are evate, are surrounded by a thick ring. The species are herbaceous plants, by a thick ring. The species are herbaceous plants, growing in temperate climates, and are all characterized by short stiff hairs on the leaves and stems. by short soin mars on the raves and strins. An arrinhalizants of Great Britain; namely, A. efficientis (the common alkanet or bugloss) and A. semperainens. The roots of the former, when boiled, yield a demulcent drink, which was once much used as a medicine. Both plants have spikes of blue flowers, very similar to those of the forget-me-not. The most important species is A. linetoria, a native of the Levant and of the southern parts of Europe. It is collivated for its root, which contains a resinous red colouring matter, and is much used in the arts. (See ALKAKET ROOT.) A. paniculata and some other species are grown as ormancital garden-plants.

Anchusic Acid, or Anchusin, &n-choo'-sik, the resinous colouring matter of alkanet root. The solubility of this principle in oil renders alkanet root useful for colouring that substance. Hair-oil is gene-

rally coloured pink with alkanet roet.

Anchyrosis, in-ki-lo'-sis (Gr. agkaloo, I bend), a term used in Med. to denote an immovable or fixed state of a joint. This condition may attack any joint state of a joint. This condition may attack any joint of the hody, and instances have been known of the whole body thus becoming anchylosed. In complete or true anchylosis, no motion whatever takes place, the heads of the bones being connected together by cessous or bony matter. In incomplete or false an chylosis, the immobility arises from eddesion of the synovial membrane, or a thickening of the parts about the joint, and usually admits of some degree of motion. Analylosis frequently occurs after sprains, dislocations. or fractures near a joint, and, indeed, may be occasioned by anything that keeps a joint long motionless, In order to prevent anchylosis, the joint is to be exercised as much as the state of the surrounding parts will admit; if it cannot be prevented, the joint is to be kept in the most convenient and natural position.

the kept in the most convenient and natural position. Analysiss is sometimes very desirable as a termination of painful diseases of the joints.

ANGIEST, aid-cheat (Fr. ancien, Lat. antiquus), usually signifies very old, and is applied to something that existed or happened long ago. It is said that old relates to a thing itself, as an old house; ancient, to time in general, as an ancient custom; but this distinction is not always observed. In a more limited sense, it is applied to that period of the world's history which receded the overthrow of the Roman empire in the West, and, in this sense, it is opposed to modern, which applies to the period since that event; but even this 69

## Andante

distinction is not always observed. The term ancients Romans; na when we speak of the philosophy of the ancients. In speaking of a thing which existed formerly, but-which has now ceased to exist, the term ancient is frequently used.

ANCIENTS, gentlemen of the inne of court and chancery. In Gray's Inn, the society consists of benchers, ancients, harristers, and students under the bar; and here the ancients are of the barristers of the longest standing. In the Middle Temple, such as have gone through, or are past their readings, are termed ancients. The lans of chancery consist of ancients and students, or clerks; and from the ancients, one is

yearly chosen the principal or treasurer.

ANGILE, cin. si<sup>\*</sup>-le (Lat.), in Romau Antiq., a sacred shield, which was believed to have fallen from heaven during the reign of Nums Pompilius. It was an object during the reign of Nums rompinus. It was an object of veneration, more especially on account of the tradition, which declared that so long as Rome possessed it the empire of the world should be hers. This holy buckler was placed in the keeping of twelve priests, in the temple of Mirs; and in order that it should be the more effectually preserved, cleven other shields were made, so much like the true ancile, as not to be distinguishable from it. The ancile was held to have descended to the earth upon the calends of March, and, consequently, the tweive aucilia were once every year, at this period, carried round the city in solema procession.

Ancilla, or Ancillaria, an-sil-lai'-ri-a, in Zool., a term given by Lamarck to a gen. of mollusca. They are somewhat numerous, principally found in tropical climates. Some of them are furnished with a small tooth, which is placed at the end of a groove crossing the front of the shell. The most common species is the ivery-shell; this and some others are distinguished from the genus in general, by having the front of its axis deeply pierced. The shells are usually very amouth, as if polished.

ANCONEUS, an-ko'-ne-us (Gr. agkon, the clbow), in Anat., a small triangular muscle, situated immediately beneath and behind the elbow-joint. It is connected with the humerus above, and the ulna below,

and assists in extending the fore-arm.

ANCYLUS, ön-si-lus, in Zool, a molluse, commonly known as the fresh-water limpet. It is common in stagnant water and rivulets in Europe, America, and the West Indies, adhering to stones and plants. is closely allied to the pond-snail, differing principally in the conical form of the body and shell. It agrees with it in having two compressed triangular tentacles, with it in having two compressed triangular tentacles, with the eyes sessile on the outer base. A early in the middle of the back serves for the purposes of respiration, and an aporture closed by a valve opens in the middle of the left side. These shells are occasionally mistaken for those of the Syphonaria; but they may be readily distinguished by their being sinistral, very thin, and covered with a bairy periostraca.

ANDA, int-di, in Bot, a gen, of plants belonging to the nat, ord. Exphorbiacea. The species d. brashiensis is a tree which grows in Brazil, having large vellow theorem. and producing fruit about the size of

yellow flowers, and producing fruit about the size of an orange, but of an angular form. Each fruit conan orange, but of an angular form. Each fruit contains two roundish seeds, resembling small chestnuts. These seeds, called Parga dos Paulistas, yield a very purgative oil, used medicinally in Brazil, the ordinary dose being twenty drops. The seeds are also used for the same purpose as the oil. The bark, when thrown into ponds, is said to stupely fish; and this part of the tree, roasted, forms a favourite remedy for darrhoes brought on by cold. No other species is known.

ANDANYE, an-dan-tas (Hal.), in Mus., a term used to imply a time supershat slow, and a performance dis-

imply a time somewhat slow, and a performance dis-tinct and exact. It forms the third of the five divisions of musical movement, and may be said to be the medium between the extremes of quick and slow. It is likewise used substantively, thus:—an "Andante of Haydn," &c. Andante offstuons, slow and with feeling; andante con mato, a little faster than sudante; increms; amounts con moto, a new master than unusate; and unite oraziono, show but gracefully; and anothe large, or largo and ante,—by this expression is understood that the performance of the movement to which it is prefixed is to be slow, distinct, and exact; and ante master accessos, slow with majesty; and ante non troppo, slow,

## Andira

but not too much so; andante pastorale, slow and with

pastoral simplicity.

ANDIEA, du-dit-ric, in Bot., a gen. of piants belonging to the nat. ord. Legensinees, sub-ord. Papilionaces, characterized by a one-ordine one-seeded pod. lienacea, characterised by a one-celled one-seeded pod, almost orbicular. The species A tree-wis is a native of the West Indice, and is commonly known as the Cabbage-bark tree. The bark, called either cabbage-bark or worm-bark in commerce, was formerly nuchused medicinally as an anticominate (see this word). It possesses cathartie, smetic, and narcotic properties. In large does it is poisonous. The tree is said by some authors to furnish the particings-wood of the cabinet-makers; but a plant belonging to another order is named by others as the source of this ornamental wood. (See Harstrain.) The species A reisso, a native of Surinam, yields bark with similar properties, which is commonly known as Surinam bark.

Andrinon, of Harstrain, and in Arch., a contrivance which was, in old English houses and halls,



ANDIRON.

lish houses and halls, made use of to assist in the burning of the logs of wood placed upon the hearth. In old inven-tories of furniture, the term is frequently employed; and at the pre-sent time is sometimes used for what is more used for what is more commonly called a fire-dog. The andirons were used in pairs, one on each side of the hearth. The logs of wood were placed upon the horizontal bars, the upright portion, or standard, being merely ornamental. The standard frequently bore the armorial bearings of its

owner; and sometimes arabesques, or other designs,

ANDIEST. armorial bearings of its owner; and sometimes arabesques, or other designs, were traced upon it in silver, particularly in the reign of James I. At a later period, the upright portion of the auditon was often fashionedso represent a human figure. In the hall at Penshurst, Kent, a large andiron it still to be seen standing upon the hearth.

Andersas, da-dre-dd-se-s, in Bot., Split mosses, a fam. of terminal-fruited mosses, characterized especially by the peculiar mode of splitting of the fruit, or, more correctly speaking, the sporangium. This urnshaped capsule divides perpendicularly, when ripe, into four or eight valves, which remain attached together at their upper and lower points. The few British species which constitute the gen. Andersa are natives of rocky and usually mountainous districts.

Andersands. (See Bries.)

Andersands. (See Bries.)

Andersands. (See Bries.)

Andersands the Soft November, the day, occording to others, on which he suffered martyrdom, according to others, on which he relies were brought to Constantinople, in 359.

Andreasum or male organs of a flowering plant, taken collectively.

Andreasum or male organs of a flowering plant, taken collectively.

collectively.

Andrews, in Bot, a term sig-nifying male-female, sometimes applied to that kind of inflorescence which exhibits distinct male (staminal)

Andrews, its design to that kind in modern makes applied to that kind in moderacence which exhibits distinct male (staminal) and female (pistiliate) flowers.

Andrews, and design to the control of the of inforescence which exhibits distinct male (staminal) and female (pistillate) flowers.

And prottes, and of index (Gr. andres, of man, and eides, form), a term used in Mech, to denote an automaton in the figure of a human being, which, by nearly of a combination of springs, levers, &c., skiffully contrived, either walks or performs other external functions of a man. The ricest effects and automated figures of men which have been exhibited in modern times, are, the fluts-player of Vancasson, constructed and exhibited at Paris in 1810; and the chess-player of M. de Kempelen, of Presburg. (Sec. Automaton.) AUTOMATON.)

## Anecdote

lation named by the Greeks after the mythical daughsecon named by the creeks after the mythrest daugh-ter of Cepheus and Cassiopeia. This constellation— a very fine one—is composed of fifty-nine stars, and occupies a considerable region of the heavens som occasiones, by which it may be easily found. A line drawn through the brightest star of the five forming the latter constellation and the Pole-star passes through a star of the first magnitude, named Alpherst, in the head of Andromeda. This constellation is represented in the celestial planisphere by the figure

represented in the celestial planisphere by the figure of a chained woman.

Androwness, in one for (Gr. ener. male, phores, brought into), in Bot., a name given to a tube or column formed by the union of the stamens by their filaments, as in the flower of the mallow.

Androwness in the flower of the mallow.

Androwness of the mallow. name. Many species are remarkable for their fragrance, which is due to the presence of volicile oils, same of which are used in perfumery and medicine. There is considerable uncertainty, however, as to the particular species which yield the different oils. A treavacusa is supposed by some to have furnished the precious spikenard oil of Scripture; and A. calcanus aromaticus has been pointed to as being probably the plant termed the sweet calamus and sweet cane. The oil knawn in India as roshé or roxé oil, and, in England, as Turkish essence, or oil of geranium, and oil of ginger-grass, is reputed to be the produce of the latter species; but, in all probability, it is derived from several Indian andropogons. This oil is employed by the Turks to adulterate otto of roses, and is considered by some to adulterate otto of roses, and is considered by some to be identical with the grass-oil of Nemaur. The species A. citratum, Indian lemon-grass, is most likely the source of the oil of lemon-grass of the shops, which is source of the oil of lemon-grass of the shops, which is much employed in performery, under the name of oil of verbena, from its odour resembling that of the sweet verbena, or lemon-plant. Citronelle, or citronelle oil, is also the produce of this, or of an allied species. The leaves of the Indian lemon-grass have been used as a substitute for tea, and the centre of the stem is employed for flavouring curries. A. muricatus, vittievar or cuscus, also yields a fragrant oil, which is much used medicinally in India, and there known as kuskus oil. Its root, which is imported into this country for scenting baskets and other articles, has been employed medicinally as a gentle stimulant and antispasmodic. antispasmodic.

ANDROSERUM, androse mum, in Rot., a gen. of plants belonging to the nat. ord. Hypericacea. The species A. officinals has tonic and astringent properties,

which render it useful in medicine.

ANDROUS, introduct, in Bot., a term signifying a stamen, which is sillxed to the Greek namerals, in order to form names used in describing flowers, when it is desirable to indicate the actual number of stamens they contain. Thus, the presence of only one stamen makes a monandrous flower, as in the Hippuris; if two male organs are present, the flower is diandrous, as in the Ash and Privet. To complete the list in as small a the Ash and Privet. To complete the list in as small a space as possible, we will merely give the terms, number of stemens, and examples, thus:—triandrous, three, most of the grasses; tetrandrous, four, Holly and Plantain; pentandrous, give, Cowsip and Convolvalus; heavandrous, six, Lily and Tulip; heptundrous, seven, Esculus and Trientalis; octandrous, eight, Ivy and the Heaths; enmeandrous, nine, Flowering Euch; decondrous, ten, Pink and Saxifrage; dedecandrous, twelve, asseraluces: consupersus. twenty. Strawherry: nodura-

#### Analectric

Græca of Muratori. In common language, an anecdote is a detached incident or fact of an interesting nature, usually connected with the life of a distinguished individual.

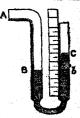
guished individual.

Argueranc, in 'e-lek' trik, in Phys., a term sometimes applied to a body in which, under ordinary circumstances, electricity cannot be entited by friction. It is synonymous with the more familiar word non-electric. Ancelectrics have the power of transmitting or conducting electricity. The best conductors, or the most perfect analectrics, are metallic bodies, charcoal, and saline fluids. (See ELECTRICITY.)

ANEMIDICTION, "m-e-mi-dic-ti-on (Gr. aneimon, naked; diktyon, a net), in Bot., an ornamental species of ferns, succeeding well in open loamy soil.

ANEMIOPSIS, in-e-mi-op'-sis (Gr. aneimon, naked; open, appearance), in Bot., so named in allueion to the appearance of the inflorescence. A genus of plants growing in marshes and pools of water in North India, North America, and China.

ANEMOMETER, an-e-mom'-e-ter (Gr. anemos, the wind; ANEMOMEREE, on-e-most-e-ter (Gr. anemos, the wind; metron, a measure), an instrument for measuring the force of the wind. Of the many anemometers which have been devised, that of Dr. Lind-is the best for ordinary observations. It consists of a curved tube of glass, partially filled with water and attached to a cale. The tube is bent into somewhat the shape of the letter U, and the bore is considerably contracted at the batturn as a check or the oscillations to which at the bottom, as a check on the oscillations to which the water is subject from alight variations in the force of the wind. One leg of the tube is rather longer than the other, and its upper part (A) is bent at right angles, so that the wind may blow into it horizontally. The wind, by acting upon the water in the one leg, causes it to rise in the other—that is to say from B to C,-until the pressure of the column of liquid balances the force opposed to it; consequently, the height at which the water stands indicates the strength of the wind. Another common ane-



DR. LIND'S ANEMO. METER.

mometer consists of four small metal vanes fixed to a horizontal axis, and made to revolve like the sails of a windmill. On the axis is a perpetual sorew, which turns a vertical cog-wheel round a second axis placed transversely to the former. To the second axis is attached a bar, on which a weight is fixed, so that the sails cannot turn withthat the sails cannot turn with-out moving round the bar in a vertical circle. When the wind acts upoy the sails, the bar rises; and this continues until the increased leverage of

the weight furnishes a counterpoise to the moving force of the wind. The number of degrees through which the bar is moved to produce this effect is



BOBINSON'S ANEMOMETRE.

Anemones, Sea

a petaloid calyx, scarcely distinguishable from the corolla; and soft, woolly achemia, which in some species have sally tails. As many of the species species have sally tails. As many of the species flourish in very exposed situations, they have been called wind-flowers. The most remarkable English species are A. nemous and A. pulsatilla. The first, which is commonly known as the wood-anemous, is one of our earliest spring flowers, and may be assisted to the second of our earliest spring flowers, and may be assisted as the second of our during March and April in simost any wood. It is a perennial plant, with knobby roots and a short stem, having one or two dark green deeplycut leaves. The stalk bears a single flower, the calyx of which is white, delicately tinged on the outside with purple. The species Fulsatila is the beautiful pasque-flower found growing wild on exposed downs in several parts of England. It has finely-cut hairy leaves, and large purple flowers, very silky on the outside. The various garden anemones which exhibit so many brilliant colours, are cultivated varieties of the Levant. The natural size of each flower is increased by cultivation, and many of the stamens are a petaloid calyx, scarcely distinguishable from the the Levant. The natural size of each flower is in-creased by cultivation, and many of the stamens are often changed into small petals, or, in other words, the flower becomes double. The anemones have, in common with other Kannnoklacea, very acrid proper-ties. Thus the leaves of the pasque-flower will raise blisters of the skin, and, if chewed, will produce irri-tation of the threat and tongue. The acridity of the roots of this species is so great, that, when adminis-tered in very small doses, it occasions nauses, and sometimes causes violent vomities.

sometimes causes violent vomiting.

A NEMONES, SEA, the popular name for the plant-like animals formerly included in the gen. Actinia, but like animals formerly included in the gen. Actinia, but now distributed in several genera. (Sec ACTINIA.)
They are found on all shores, generally attached to the rocks which are only exposed at low tide. A great number of beautiful species are common to our English coasts, but the larger and more brilliant ones cocar in tropical seas. When fully expanded, their tentacles, which are usually richly coloured and arranged in regular circles, greatly resemble the petals of some of our most symmetrical simple flowers, such as the paraicold carnation, and absence: or still more marigold, carnation, and anemone; or, still more closely, the florets of composite flowers, such as the daisy and chrysanthemum. This resemblance suggested the names sea-anemones and animal-flowers, by which they are commonly known. Since the invention which they are commonly known. Since the invention of the aquarium (which see), these humble creatures have become household pets, and their habits have been carefully studied. It is only in the aquarium that they can be seen to advantage; for when exposed on their nativerocks by the fall of the tide, they appear either like amooth lumps of opaque jelly or as mere sand-coated excrescences. In each hemispherical or sand-coated excrescences. In each nemispherical or conical lump, however, a puckered hole, indicating the position of the month, can generally be detected. When placed in their proper element, and allowed to remain undisturbed, the sea-anemones gradually unfold their tentacles, and prepare to take into their elastic stomachs any dainty morsels which come within their stomachs any dainty moresis which come within their reach. They are extremely voracious, and though apparently mere masses of jelly, they can digest almost anything. The tentacles seem to have the power of benumbing the prey, for little worms seized by them struggle for a few moments, and then become paralyzed. A slight tingling or pricking sensation has been felt by some observers on touching the tentacles with measured on a dial, the hand of which turns on the axis of the cog-wheel. By an ingenious instrument, which has been recently invented, the fluctuations of the wind are registered on a sheet of paper made to movable plate on which the wind acts. Dr. Robinson's nemometer exercise, upon a vertical revolving shaft, four horizontal arms, at the extremities of which are four hemispherical cups: these cups are ascertained for revolve at the rate of one-third of the velocity of the wind. By the aid of wheelwork the revolutions of the wind thus shown. (See Arronxwamics.) AREMONE, anewo-o-ne (Gr. anewos, the wind), in Bot, a gen. of plants belonging to the nat. ord. Robinson's plantson p the hand, and the microscope has revealed the existence

## Aneroid Barometer

is a circle of azure tubercles, resembling turquoise beads. The species Activoloba diunthus, so called from its resemblance, when fully expanded, to the carnation, or diunthus, is generally pure white, or slightly tinted with cream or rose-colour. It is considerably larger than the smooth sea-anemone, and is the most coveted species of sea-side naturalists. *Tealia crassicornis*, the thick-horned animal-flower, has fewer tentacles than the creatures we have mentioned, and these organs are beautifully translucid, and marked with coloured rings. It is one of the largest, and certainly the most curious of our British sea-anemones. There are a great number of species, besides the three numed above, found on our coasts.—Ref. Gosse's History of British Sea-Anemones; Johnston's British Zoophytes.

Artica Nea-Amenones; Johnston's British Zoophytes.

Arkeou Baromerer, inde-roid (Gr. a, without, meros, watery, and eidon, form), the name given to an ingenious instrument for indicating the variations of atmospheric pressure without the aid of a liquid, as in ordinary barometers. Its action depends on the principle, that if a very thin metallic tube be coiled, any internal pressure on its sides tends to uncoil it, and any external pressure to coil it still more. The instrument essentially consists of a thin metallic tube, curved so as to form about seven-eighths of a circle. This tube, being exhausted of air and hermetically closed. is fixed by its middle, so that whenever the atmospheric 18 tixed by its intentions, it uncoils; and, on the other hand, whenever the pressure increases, it contracts. The ends of the tube are connected by lovers with a needle, which travels over a scale, on which are marked divisions corresponding to the inches on the scale of the mercurial harometer. In another modification of the mercurial harometer. In anomer modulcation of the aneroid barometer, the pressure of the atmosphere acts upon a circular metal tox, about three inches in diameter and a quarter of an inch deep, which has been nearly exhausted of air and then soldered air-tight. The sides of this vacuum-box are very clastic, being corrugated in concentric rings, and they approach to or recede from each other, according as the pressure of the atmosphere is great or little : in fact, the metal box may be regarded as an extremely sensitive spring. 1340.

The index hand in this instrument, as in the other, is connected with the essential part by an ingenious arrangement of levers and springs. Mr. 5. Browning and M. Bourdon have also devised improved barometers upon this principle. (See Atmosphere, Barometer.)

ANESOHIBER, DAROHTER.)
ANESOHIZA, ün'e-ce-ori'-za, in Bot., a gen. of plants belonging to the nat. ord. Umbeltiferæ. The species A. cupensis is cultivated as an esculent vegetable at the Cape of Good Hope.
ANESTHEN innel the confirm

ANETHUM, and thum (Lat. anethum, dill, anise), a gen. of plants belonging to the nat. ord. Umbellifera. The species A. grayedens is commonly known as the

Dill. The fruits—improperly termed seeds—of this plant are imported into this country in large quantities every year from the south of France. They have carminative properties, due to the presence of an essential oil, contained chiefly in the vittle of the pericarp. Dill-water, for instance is a well-known domestic remedy for flatulence. The fruits are used

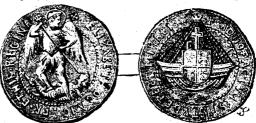
domestic remedy for naturence. The trutts are used in the manufacture of gin.

ANBUBISM, diffusion (Gr. aneurino, I widen or dilate), in Surg., is generally defined to be a pulsating tumour, containing blood, and communicating with the interior of an artery. It is a tumour formed by a preternatural dilatation of a part of an artery, or by the extravasation of arterial blood in the cellular members, accessed on the contract of a resulting or want of the brane, in consequence of a rupture or wound of the brane, in consequence of a rupture or wound of me coats of an artery. The former is termed true, the latter false or spurious aneurism. If the external membrane of an artery is injured, and the internal protrudes through it and forms a sac, it is called a mixed aneurism. Aneurisms arise partly from too weakness in the membranes of the artery. They are most frequent in the adult, between the ages of 30 and 50, and occur oftener in the mule than in the female; but no age is wholly exempt from them. They may be met with in any part of the body, and are usually divided into external and internal; the former occur-

# Angel-Fish

ring on the limbs, neck, or external part of the head; the latter form in any of the cavities of the body, as the thorax or abdomen, and generally affect the aorts or some of its principal branches. In the early stage of aneurism, if external, a small pulsating tumour is observed, which entirely disappears when compressed, the latter form in any of the cavities of the body, as the observed, which entered mappeass when compressed, but returns as soon as the pressure is removed. It continues to grow larger, and as it increases in size its pulsations become weaker, partly on account of its greater distance from the course of the blood, and greater distance from the course of the blood, and sometimes also from the accumulation of fibrine within the cyst. Sometimes this fibrine consolidates, and becomes connected with the walls of the cavity, which it at length fills up, occasionally bulging into and choking up the artery. This, however, is a termination of aneurism that is unfortunately rare. In most cases, the dilatation of the sac goes on until, if not arrested, the inclosing membranes give way, and the patient expires from loss of blood; or death may be produced by pressure upon important parts, as the trachea, assophagus, nerves, &c. The cure of aneurism consists in applying a ligature to the artery above the tumour: the ingress of blood into the sac is thus pretumour: the ingress of blood into the sac is thus pretumour: the ingress of 1000 into 108 act is tuns pre-vented, and its contents are gradually absorbed. The blood, being interrupted it its course through the artery, passes with greater force into the collateral branches, permanently enlarging them; and thus the necessary circulation to the parts beyond the obstruction is carried on. Internal aneurisms not admitting of such treatment, recourse must be had to such means as moderate the action of the heart, and depress the general circulation, thus inducing the formation of fibriue within the sac, which may gradually fill it up. These consist of repeated bleedings, low diet, perfect rest, and the administration of gentle laxatives and medicines which moderate the action of the heart; as digitalis, &c.

Angel, nin'-jel, an ancient gold coin in England, which was so named because it bore upon its obverse the figure of the archangel Michael piercing a dragou. It appears to have been first coined in France, about 1340. In 1465 Edward IV. introduced it into England,



ARGEL.

where it continued to be coined until the close of the reign of Charles I. Its value differed in different

reign of Charles I. Its value differed in different reigns, but is now only an imaginary sum, or money of account, implying ten shillings.

ANGEL, a term which is derived from the Greek aggeles, signifying an envoy or messenger. It is thus properly the name of an office, without reference to the person employed; and hence human beings, as prophets, priests, &c., are sometimes called angels. The Jews, however, and after them the Christians, have regarded angels as a class of intelligence superior to man employed in carrying out the gences superior to man, employed in carrying out the gences superior to man, employed in carrying out the Divine commands. They have on several occasions revealed themselves to man. Before the captivity of Babylon, no angel is mentioned by name. After that time the names of Raphael, Gabriel, and Michael, occurin Scripture. The Jews divided them into different classes and ranks; and Dionysius the Arcopagite, in his Heavenly Hierarchy, divides them into three classes, each containing as many orders. Most hold that angels were created before the visible world; others, on one of the six days; for, even on what day it took place, they are not agreed. Swedenborg gives a classification

and detailed account of angels.

Angels-Fren (Squatina Angelus).—This curious fish, which is common on the British coasts, derives its

# Angelic Acid

name of angel-fish from its pectoral fins having some resemblance to wings. It is remarkably ugly, having a large head and capacious mouth, set with five rows of teeth, which are broad at the base, and sharp and pointed above. Like the rest of the shark tribe, these teeth, by the aid of muscles, are capable of being raised and depressed. It has small eyes, set in a crescent-shaped orifice. The back is very rough, and of a grey colour; the belly is white and smooth. It is an extremely voracious fish; and, lying at the bottom of the water, preys upon the smaller fishs which abound there. It measures about eight feet in length, and weighs about a hundred pounds. Formerly its flesh was considered a delicacy; but modern epicures pronounce it coarse and unpalatable. The skin of this fish is used by cabiand unpalarance. The sam of this non-sequence of meters for polishing purposes, and is also made into a fine kind of shagreen. The peculiar structure of the peculiar structure of the peculiar structure of the peculiar structure. this fish has gained for it two other names, by which it is frequently known. By some it is called the monkfish, because its head appears to be enshrouded in a The term fiddler-fish has also been given it, although its shape bears little resemblance to that musical instrument. A species (Squatina aculeata), which has a row of spines along the back, is found in the Mediterranean.

Arkelle Acin, an'-jel'-ik.—This neid is met with in the roots of the different species of angelica. From the possibility of distilling it, and from its high fusing-point, it is supposed to belong to the oleic series.

ANGELICA, in Bot. (See ARCHAN ANGELICA TREE. (See ARALIA.) (See ARCHANGELICA.)

Angeliei, or Angelics, an jel-iks, an ancient sect of hereties, supposed to have been so called from their worship of angels. The council of Laodicea denounced this error, stating that "Christians ought not to forsake the church of God, and go aside, and hold conventicles, to invoke or call upon the names of angels, which things are forbidden."

ANGELITES, an included a sect of heretics which existed in the reign of the emperor Anastasius, about 494, and were so called from Angelium, a place in the city of Alexandria, where they held their first meetings. They held that the persons of the Trinity are the same; that none of them exists of himself and of his own nature; but that there is a common God existing in them all; and that each is God by a participation of this deity.

ANGER, an'-ger, an emotion of the mind, occasioned by an injury done or offered to a person, or some one in whom he feels interested, and accompanied by a desire of revenge. Like the other mental passions, anger has its use and its abuse. "In morality, and in preserving the order of the world, resentment is a powerful instrument. Not merely the hurt that anger prompts to, but the very expression and aspect of the passion, inspire dread, and make men exert themselves to avoid causing it. Our anger is a wall of fire around us. In the government of human beings, the display of angry relings suffices very often to check disobedience."
(Bain's Emotions and Will.) The abuse of the passion is whon it is occasioned by trivial or insufficient causes, or when it is continued too long. "Let not the sun go down upon your wrath" is one of those particular of Senitration and the sun go. sayings of Scripture that contain volumes of philosophy. The proper government of this passion, which all should strive after, consists not in suppressing it, but in repressing that desire of revenge to which it rives rise. The effects of anger upon the physical system are very marked. The action of the heart is much increased, and the circulation of the blood is accelerated; the face becomes red and swollen, the brows knit, the eyes startle, and the whole body is in violent agitation. It frequently gives rise to diseases of the heart, brain, or other organs; but remarkable cures are also reported to have been effected by it, as ague, paralysis, cout, &c.

# Angler-Fish

to half an hour or more, and come on suddenly, at irregular intervals. They are often excited by violent exercise, strong mental emotion, or a derangement of the digestive organs; but frequently make their sp-pearance without any manifest exciting cause. It is met with chiefly in the middle-aged or old, and is more frequent in males than females. Physicians are by no means agreed as to the seat and nature of this disease, and dissection has shown almost every disease of the thoracic viscers in connection with it. It seems most probable, however, that it primitively arises from a disordered state of the nerves in connection with the lungs and heart, which produce organic changes in these organs, or in the large vessels communicating with them. It is the nature of this disease to proceed with them. It is the nature of this disease to proceed from bad to worse, until at last the patient expires during a paroxysm of more than usual severity or duration, or falls a victim to some of the many organic lesions of the heart with which it is so often attended. Where the patient is young, or of good constitution, and where there are no symptoms of organic affection, success frequently attends early, active, and judicious treatment. Violent exercise and strong mental emotions are the activity of the patient of the strong mental emotions are the activity of the patient of the strong mental emotions are the activity of the strong mental emotions are th tions are to be avoided, as well as long fasting or too tions are to be avoided, as wen as long lasting or too full meals, and sudden exposure to great heat or cold. In fact, the patient "must lead a sober, quiet, and temperate life, in which neither the emotions of the soul are to disturb the functions of the body, nor comporeal affections are allowed to disturb the serenty of the mind.'

Angiosperms, an'-je-o-sperms (Gr. aggeion, a vesse), sperma, seed), in Bot. flowering plants having their ovules or rudimentary seeds incased, or in ovaries. The ovules are fertilized indirectly by the action of the pollen on the stigmas. Plants with naked ovules are distinguished as Gymnosperms (see this word). In the system of classifi-

cation adopted by Professor Bentley, the great class of Dicatyledones are divided into angiospermous and gymnospermous plants.



BRUIT OF AN ANGIOSPERM.

nospermous plants. The first division, which is termed Angiospermia, is by far the more comprehensive, and embraces the sub-classes Thalmifura, Calyeiflora, Corollifora, and Monoclanydea. The second division, called Gymnospermia, forms a single sub-class. (See BOTANY, OVULE,

ANGLE, "ing-el (Lat. angulus, a corner), in Geom., the inclination of two lines meeting one another in a point. These lines are also called the "legs" of an It is not upon the length of these lines or legs, angle. It is not upon the length of these lines or legs, but upon the degree of their separation, that their definition depends. A pair of compasses will afford a practical illustration of different angles: half-way between shut and straight they exhibit a right angle; close them a little, and they contain an acute angle; open them a little, and they contain an obtuse angle. A right angle is an angle of 90 degrees. (See Guometra.)

Angler, ang'-ler, a term applied to one who fishes

with an angle, an instrument consisting of a rod, line,

and hook, by means of which fish are taken.

ANGLER-FISH (Lophius piscatorius).—The angler-fish is known also as the sea-devil, fishing-frog, and toadfish. Judging from its appearance, the name fishing-frog would seem to be the more correct appellation, frog would seem to be the more correct appellation, as it more resembles a gigantic tadpole than anything else, and a very ugly tadpole to boot, as it is, almost without exception, the most ungainly-looking fish in creation. Its head, which forms quite half of its body, is flattened on the top, and the mouth extends nearly the whole width of the head, on the top of which are placed, pretty closely together, its two large black eyes. The nostrils have no external orifice, but two internal ones, answering the same purpose. The lower jaw of the angler is considerably longer than the upper; both are provided with rows of sharp conical teeth. The upper parts of the body are of a brown colour, the lower parts white. The pectoral and ventral fins are of the same colour, and the tail is nearly black. The angler, being a voracious fish, and at the same time far from an industrious one, is compelled to resort to artifice to obtain a living, and the paralysis, gout, &c.

ANGINA PROTORIS, &n-ji'-nā pek'-to-ris, literally signifies a contraction or tightening of the chest, and in Med, is the name of a disease of the chest, characterized by a feeling of painful constriction at the lower part of the sternum or breasthone, inclining to the representation of the left arm. The pain is very acute, accompanied with a difficulty of breathing irregular action of the heart, and a feeling of approaching dissolution. The pararysms last from a few minutes produced to resort to artiflee to obtain a living, and the many content of the same time far from an industrious one, is compelled to resort to artiflee to obtain a living, and the many content of the same time far from an industrious one, is compelled to resort to artiflee to obtain a living, and the many content of the same time far from an industrious one, is compelled to resort to artiflee to obtain a living, and the many content of the same time far from an industrious one, is compelled to resort to artiflee to obtain a living, and the many content of the same time far from an industrious one, is compelled to resort to artifle to obtain a living.

# Angling

modus operandi is somewhat singular. Affixed to the front of its head are two bony filaments, the foremost one dilated at the tip, and having a silvery lustre. Firstly, Lophius piscatorius settles itself comfortably



ANGLER-FISH.

at the bottom of the water, and, shaking up the mud or sand a bit, makes the water somewhat turbid. Having thus hid its ugly person from the gaze of squeamish fish, who might take an objection to its appearance, and hence keep clear of its locality, it hazily flutters the appendage aforesaid to and fro in the water. The but easily takes, and small fish, who imagine they are about to make a meal of the little shining worm find themselves, in a twinkling, in the capacious jaws of the angler. Not always, however, does it obtain its food in the manner described; but sometimes exhibits a boldness which certainly seems more in unison with its bloodthirsty appearance. Mr. Yarrell relates two such instances. In one case, a cod had been hooked by a fisherman, and on being drawn to the surface, he by a fisherman, and on being drawn to the surface, he was astonished at finding an angler hanging to it. So tenacious did it keep its grip on the cod, that he was compelled to strike it a severe blow before it would quit its held. Another time, an angler had seized a conger eel, and the latter had wriggled itself into the bronchial aperture of its captor. In this condition, they were both brought to the surface. The average size of the angler is about three feet, although it has been known to attain a length of five feet. In itself, the fish is of no value, but morned the time found. the fish is of no value; but many of the fish found in its stomach are generally quite uniquired, sometimes alive; and the fishermen frequently make n little money by exhibiting the fish itself to seasile visitors, generally accompanying their exhibition with a most doleful lamentation upon the ravages committed by doleful lamentation upon the ravages communes of their not very prepossessing captive. Closely allied to the foregoing species are several others:—1. The Cornish angler (Lophius cornabicus); 2. the muricated angler (Lophius mixicatus); 3. the beaked angler (Lophius rostratus); 4. the harlequin angler (Lophius strictus); 5. the striped angler (Lophius strictus); 6. the marked and and or (Lophius margaratus).—Ref.

the marbled angler (Lophins marnoratus); o. Ref. Dallas's Hist, of Animal Kingdom.

Arcting, ingt-ling, the occupation of a fisherman, particularly applied to the art of taking fish in freeh particularly applied to the art of taking use in fresh water, rivers, ponds, and brooks, with a rod, line, and book, to which is attached a natural or artificial bait or line. There are two methods of angling,—fly-flshing and bait-flshing. The former is chiefly practised during the summer months, when insects are most plentiful, by those who are really fond of a sport requiring by those who are reany ionu of a sport requiring considerable skill, and affording no small degree of excitement, and angle for salmon and trout, and those fish which are usually found in rapid rivers and swiftrunning streams. Bait-fishing is generally followed in deep sluggish rivers and large pond-like pieces of water, which are-frequented by perch, roach, carp, pike, dace, tench, gudgeon, &c. The necessary fishing-tackle for an anglor comprises a red and reel, lines, hooks, silkworm gut, and artificial flies; a fishing or tackle book especially, for the reception and preservation of these articles when not in use; baits of various kinds, boxes, floats, and a basket. The most useful rod is sen fitted with different top-joints, which will serve for the purposes of throwing a fly, dibbing or dapping with a worm, foruweb, bluebettle-fly, or grass-hopper, or trolling with a minnow or stickloback. A salmon rod should be seventeen or eighteen feet long, stout, strong, and tolerably stif; for trout, a shorter, lighter, and more elastic rod should be used. The running streams. Bait-fishing is generally followed in

# Anglo-Catholic

most convenient rod is made in pieces, about three feet or more in length, fitted together with joints, with a spear screwed into the bottom of the butt or stock of the rod, which should be hollow, to hold extra topof the rod, which should be hollow, to hold extra top-joints. The reel commonly used is a small brass multi-plying one, which may be attached to the rod at pleasure, by rings sliding on the butt, allowing the angler to wind or unwind his line with greater rapidity and without check. The best line for general purposes is made of hair; but, for trolling, a silk line-is preferable. It should be white, or of a reddish colour, for clear streams; and grey, or black and is preferable. It should be white, or of a reddishcolour, for clear streams; and grey, or black and
white, for deep and muddy water. A line should be
about thirty or forty yards in length, and taper from
the end attacked to the red. The best are woven or
plaited togother in one piece, and thus are free from
knots, which prevent the line from running freely
through the rings attached to the rod. A collar of
silkworm gut, consisting of many strands firmly knotted
tagether; is attacked to the and of the line for ilvtogether, is attached to the end of the line for flydishing, to which are fastened the artificial flies best suited for the season or the fish the angler desires to take. Hooks are made of various sizes, numbered suited for the season of the first one anger desires, the take. Hooks are made of various sizes, numbered from 1 to 13, ranging from some inches in length to half an inch, or even less. The best are manufactured at Redditch. Floats are made of cork or quilt, heavier at one end than the other, to remain upright in the water. The basket is peculiar in shupe, large at the bottom, and smaller at the top; hollowed behind, to rest with comfort on the angler's back, and suspended across the chest and shoulder by a strap of leather. In addition to these, a gaff and landing-net leather. In addition to these, a gaff and landing-net are sometimes carried, to secure fish of some weight when they have been brought into shallow water. The natural baits commonly used by anglers are gentles, which are the larva of the common blowfly; the larva which are the larva of the common bloodly; the larva of the phrypaneae, called eadily or caddice-worms; the common earth-worm, found in gardens and grassically and the larva of the gaddy, found under cow-dung; caterpillars of various kinds, and different pastes or compositions which arraconsistant to be fitted. sitions, which are now considered to be of little use. These are baits for ground fishing, and must be sunk to touch the bottom, or nearly so; for which purpose split shot are attached to the gut-line, a little above the hook. Artificial flies are made from the nackles of fowls and the feathers of various birds, coloured wool, the flax of the hare and rubbit, and the fur of mice and other animals. These materials are neatly field to the shank of the nook with silk, to present some tied to the shank of the hook with sur, to present some resemblance to the insect it is intended to imitate. Among the most common are the red palmer-fly, the blue dually, the brown fly or duadrake, the saider-fly said the green drake or May-fly. For spider-fly, not the green drake or May-fly. For salmon-fishing, large flies are required, made of brilli-ant and gaudy materials.—With the description of the various fish that frequent the rivers and lakes of the United Kingdom, Norway, Canada, and other countries, information will be found respecting the locations and sensons in which they may be taken, and the buils best suited for the purpose. (See Salmon, Trour, Pike, &c.)—Ref. Izaak Walton's Complete Angler; Stoddart's Angler's Companion; Colquboun's Moor and Loch; Stewart's Practical Angler.

Loch; Stewart's Practical Angler.

Anglo-Catholic or Anglacan Chunch, ingl-li-kan, a tern cuployed to designate those churches which embraced the principles of the Established Church of England. It includes the United Church of England and Ireland, the Episcopal Church in Scotland, the Colonial Episcopal churches, and the American Episcopal Church. When and by whom Christianity was introduced into Eucland. Christianity was introduced into England is not secer-tained; but, according to some, it was in the time of the Apostles or their immediate successors. When the Apostles or their immediate successors. When the Britons were conquered by the Anglo-Saxons, who were heathens, the Church was persecuted, and its adherents driven into Wales, or reduced to a state of slavery. St. Augustine was, about the year 50%, sont by Pope Gregory I., along with some forty others, into Britain, in order to convert the Anglo-Saxons. When Christianity began to spread among the Saxons, the conversion of the king of a Saxon state was immediately followed by the elevation of his benefactor to a bishopric, the limits of which were usually contermibishopric, the limits of which were usually conterminous with those of his kingdom. Subsequently, some

Angora Wool

of the larger dioceses were divided, and new bishopries created; and, with the exception of some changes effected in the reign of Henry VIII., and a few of recent origin, the present bishoprics are the same as those catablished in Auglo-Saxon times. At first, the Church in England existed in a state of comparative freedon and purity; but gradually, and at length completely, she became assimilated in doctrine and practice to the Church of Rome, and subject to her domination. From the time of Wyolifie to the reign domination. From the time of Wycliffe to the reign of Henry VIII., nearly every parliament adopted measures to resist pontifical supremacy; and they even measures to resist pontineal supremacy; and they even several times suggested to the soverengt the appropriation of church property to secular objects. From 1534 England may be said to have possessed a national church; for ever since, except during the brief reign of Mary, the civil laws by which Christianity has been established and expounded have derived their force established and expounded have derived their force entirely from the sanction of the government of the state. In 1536 the Convocation passed, and the king adopted, certain articles, in which the Bible and the three Creeds are set forth as the foundation of belief; baptism, penance, confession, and belief in the corporal presence, are declared essential to salvation; and jus-tification is said to be obtained by the union of good works with faith. Images were to be used as examples, not as idols; saints were to be honoured, not worshipped; the use of holy water was allowed, but worshipped; the use of holy water was anowed, our its efficacy denied; indefinite prayer was permitted for the dead; and the existence of an unspecific purgatory was affirmed. In the following year the king put forth a fuller exposition of belief, in a book adopted by the Convocation, and entitled "The Institution of a Christian Man." In 1539 the law of the Six Articles was passed; these were-1. The doctrine of the Real Presence; 2. the communion in one kind only; 3. the perpetual obligation of vows of chastir; 4. the utility of private masses; 5. celibacy of the clergy; 6. the necessity of auricular confession. Death by fire and the forfeiture of all possessions were the penalties enacted for controverting the first article, and imprisonment or death for the rest; but in 1544 these penalties were somewhat modified though the numbers that suffered death under them were still very great. During the brief reign of Edward VI, the doctrines During the brief reign of Edward VI. the doctrines of the Reformation made rapid progress; the law of the Six Articles was repealed; the celebration of private masses was prohibited; the laity were allowed the communion of the cup; marriage was permitted to the clergy; images were removed from the churches; allars were converted to communion-tables; and, finally, in 1553, the Forty-two Articles were issued, catablishing the destricted of the Characteristic than the establishing the doctrines of the Charch nearly as they stand at present. A new communion service, differing but slightly from that now in use, was produced in 1547, and in 1540 the English Liturgy was first introduced, and, after being revised and somewhat altered, was confirmed by parliament in 1552. During the short reign of Mary, Romanism was re-established, and about 1500 paragraft of the incremental their contents of the short reign of Mary, Romanism was re-established. short reign of Mary, Romanism was re-established, and about 300 persons paid for their opinions with their lives. On the accession of Elizabeth, Protestantism was restored. In 1559 the Act of Uniformity re-established, with little variation, the Book of Common Prayer; and in 1571 the Articles of Religion were adopted in their present form, and confirmed by act of parliament. (See ARTICLES, TRIETY-NINE.) The doctrines of the Church of England are embodied in her Articles and Litturgy (which see); the Book of her Articles and Liturgy (which see); the Book of Common Prayer prescribes her mode of worship; and the Canons of 1603 contain, so far as the clergy are con-cerned, her code of discipline.—Ref. Religious Census of England and Wales in 1851, by Horace Mann.

Anglomania, ang'-lo-mai'-ni-a, a term used in France and Germany to denote a desire to adopt, or an admiration for, the manners, customs, institutions, &c., of England. "We have less reason," says the &c., of England. We have less reason, suys one German Conversations Lexicon, "to complain of the German Anglomania of the present day, than we had of the Gallomania of a former period."

ANGLO-SAXON ARCHITECTURE. (See ARCHITECTURE, Anglo-Saxon.)

from the North of Germany that arrived in England at intervals from 449 to 547, under Hengist and Horse, and numerous other chiefs, and gradually subjugated the greater part of the country, founding the Saxon heptarchy. The Saxons are supposed to have colonized the south-eastern coast long before this period, and, if this be the case, it is probable that the frequent inter-course of the German tribes with these settlements led them to conceive the idea of taking possession of the entire country after the departure of the Romans. The Jutes first, coming from Schleswig, made themselves masters of Kent, part of Hampalare, and the Isle of Wight; the Saxons, shortly after, took the central and remaining southern parts of England; while the Angles, arriving in bands in 527 and subsequent years, settled in Norfolk and Suffolk, the country north of the Humber, and the lowlands of Scotland. These invaders, in the eighth century, divided the territory that they had gradually wrested from the Britons into seven states, known as the Heptrerby, and formed a federal lesgue for mutual protection against foes from without, under a leader to whom the title of Bretwalda was given. (See BERTWALDA.) These states were united in 827, by Egbert, king of Wessex, who thus became king of England, or the land of the An The Anglo-Saxons were the dominant power in Eng-land from 449 to the Norman conquest in 1986, except during the short time the country was under Danish rule, from 1017 to 1042. They were converted to Christianity by Augustine, who was sent to England as a missionary in 596, by Pope Gregory I. The laws and customs of the Anglo-Saxons were derived from their German ancestors; but these were modified and improved by Alfred the Great, who laid the foundation improved by Alfred the Great, who laid the foundation of the unrivalled constitution of this country. The exping, or king, was the first person in the state; his office was at first elective, but afterwards became hereditary, though subject, in a great measure, to the will of the people. The king was assisted in the government by an assembly called the Witenagemote (see Withmagemote), composed of the leading men the kingdom among the nobles and elevery and on the kingdom among the nobles and clergy; and, without the consent of this body, the king could not lavy taxes, or commence or end any war. The next in rank to the king and athelings, or persons related by blood to the sovereign, were the caldormen, or aldormen, men possessed of great power and influence in civil and military affairs, who governed large tracts of land, or shires, as licutenants of the king. The thanca, or inferior nobles, held a position in the social scale between these and the ordinary mass of the people, who were termed ceoris: these were free men The slaves, or theows, sometimes called thralls, formed a still lower class, and belonged to the holder of the land on which they were born, and from which they never moved, the transfer of an estate from one possessor to another necessitating the purchase of the slaves. Composition was made for homicide and theft, and crimes of all kinds, by payments in money or cattle, the amount all kinds, by payments in money or cattle, the almost of remuneration in all cases being regulated by the station in life of the man to whom the wrong had been done. The kingdom was politically divided into districts called shires; each shire into hundreds, and each hundred into tithings, ten in number, the tithing containing ten families, the members of which were mutually bound for each other's good conduct and there is not the large spiritually and the large spiritually conduct and the same of the large spiritually cases while series of the large spiritually cases and the same of naturally bound for each other's good conduct and observance of the laws. Seirgemotes, or assemblies of the leading men in each shire, under the eadforman, were held half-yearly.—Ref. Sharon Turner's History of the Anglo-Surons; Kemble's Suzons in England; Knight's Popular History of England.

ANGORA CAT. (Soc CAT.)

ANGORA GOAT, ân-gor'-d, a beautiful animal, native of Angora, a mountainous city in Asia Minor. These costs have fine self silve hair onlie city in these in

goats have fine, soft, silky hair, quite eight inches in length. From this goat-hair a sort of yarn, called camel-yarn and Turkish yarn, is made. The term camel is often erroneously supposed to be derived from the name of that animal; it comes, however, from the Arab. chamal, tine. The skin of the Angora goat also yields that fine kind of leather known as oriental

ANGLO-SAXONS, un'-glo sur'-ons, the general historic fine cloths, shawls, &c. The wool is derived from the name given to the Angles, Jutes, and Saxons, tribes long-haired goat of Angora, the Cashmere goat (Capra 75)

# Angreecum

lanigeral, and the shawl-goat of Thibet (Changra). Lieut. Connolly thus describes the animal and its habitat.—"Take Angora as a centre, then Kizzil Ermah (or Huly's) Comgere, and from eight to ten hours' march (say thirty miles) beyond Bebezzar, and the march (say thirty miles) beyond Bebezzar, and the same distance beyond, to near Nalaban,—from the whole of this tract the common bristly goat is ex-cluded, and the white-haired goat alono is found. The fleece of the white Augora goat is called tiffik (the Turkish for goat's hair), in distinction to you or yapak, sheep's wool. After the goats have completed their first year they are clipped annually in April or May, and yield progressively until they attain full growth. and yield progressively, until they attain full growth, from 150 drachms to 1½ oke of tiftik (from 1 to 4 lb. English)." The raw hair of the gont is exported to France and England, both woven into the beautiful fabrics bearing the name of Engora, and in the rough state as yarn. It is the raw material which comes principally to England and France, the woven febric with the transfer of the transfe fabric being chiefly retained in Turkey. In 1820, the year when the first specimen of this product arrived in England from Constantinople, so little was the wool appreciated, that it fetched in the market only 10d. per pound. Mr. Southey, in his work upon Colonial Sheep and Wools, informs us that "within the last few years a new texture made of goat's wool has been introduced both into France and this country, which calls for particular attention. The texture consists of stripes and checks, expressly manufactured for ladies' dresses, and having a soft feel and silky appearance. The wool of which this article is made is chiefly the wool of the Angora goat. This wool reaches us through the Mediterranean, and is chiefly shipped at Smyrna and Constructionals. In adopt it is the white the terms and Constantinople. In colour it is the whitest known in the trade, and now more generally used in the manufacture of fine goods than any other. There are, however, other parts of Asiatic Turkey from which limited supplies are received, but in quality not so good as that produced in Angora. After the manu-facture of shawls with goats' wool declined in France, this raw material remained neglected for a long while About the year 1852, however, the French another attempt, and brought out a texture for ladies' dresses in checks and stripes, which they call poil de chèvre. The warp is a fine-spungsilk coloured, and the energe. The warp is a mne-spungenk coloured, and the west Angora or Syria white wool, which was then thrown on the surface. This article has a soft feel and looks pretty, but in weaving is apt to cut. The price of a dress of French manufacture has been from £2. 10s. to £3, but, by adopting a cotton warp, the same article is now made in England and sold for 15s.; and it is found that the cotton warp, as a mixture, suits the goats' huar best." The wool is manufactured chiefly at Bradford and Norwich, and some of it in Scotland. In France it is spun in Paris, Montataire, and elsewhere. In 1848 the quantity of goats' wool imported into this country was 896,865 lb.; in 1863 it reached 3,434,705 lb., which, taken at the average value of nearly 2s. 11d. per lb., gives the total of \$502,728. In England it is manufactured into light cloth for overcoats, for plush, and for coach-lace, &c. In France it is manufactured into shawls, in value varying from £4 to £16 each. A lace is likewise made from it, which can be sold at half the price of the costly Chantilly and Valenciennes lace.—Ref. Urc's Diet. of Arts, Manufactures, and Mines.

ANGRECUM, an gret-kam, in Rot., a gen. of plants belonging to the nat. ord. Orchidacca, the Orchis family. The dried leaves of the species A. fragrans family. The dried leaves of the species A. fragrans form Faham or Bourbon tea, used in the Mauritius for making a beverage somewhat resembling the infusion of ordinary Chinese tea.

ANGUILLA. (See EBL.)

Anguinum Ovum, ön-gwi'-num o'-vum (Lat., adder-stone), the adder-stone, supposed to be made by the saliva of a cluster of serpents, and possessed of magical virtue. The superstition was prevalent among the ancient Britons, and is still faintly preserved amongst the Welsh peasantry. It was a glass bead used by the Druids, who pretended that the possessor should be fortunate in all his undertakings. The test of its genuineness was to enchase it with gold and throw it into the river. If it was genuine, it would swim against the stream.

Anguis. (See Blind-worm.)

# Anhydrous

ANGUSTURA BARK, OF CUSPARIA BARK, dn-gus-tu'-ra, a valuable drug, imported directly or indirectly from South America. In small doses it acts as a stimulant. tonic, and febriage; while, in large doses, it is somewhat emetic and purgative. This bark is the produce tonic, and februage; while, in large doses, it is somewhat emetic and purgative. This bark is the produce of different species of Galipea (which see), and its characteristic proporties depend on the presence of an active principle, to which the name Cuspaviu has been given. It has fallen into disrepute on the continent, in consequence of the substitution for it of a very poisonous bark obtained from the Strychnas naxromica. At one time the substitution was so common, that the importation of Angustura bark into Austria was prohibited, and the whole of it then found was ordered to be destroyed. At the present time such has

ordered to be destroyed. At the present time such a substitution is happily very rare, though it was detected a few years since in Dublin.

ANHINGA. (See DARTER.)

ANHINGALOR, ön'-hi-dride (Gr. a, without, and ador, water), a term applied to an anhydrous acid by the followers of Gerhardt's theory of chemical proposed there are a linear transfer and the second of t nomenclature, according to which all oxy-acids are supposed to ensist of their respective anhydrides, plus an equivalent of water. Thus nitrie acid is supposed to be NO, + HO, or HNO, NO, being adrice anhydride. This view is borne out by the fact, that the various ambydrides, both organic and inorganic, are destitute of any acid reaction. Some are even capable of being dissolved in water without showing any of the characteristics of an acid. Salts, according to this view, are formed by the substitution of an atom of metal for an atom of hydrogen in the acid. Thus, nitrate of potassium, as it would be called according to this theory, would be KNO, or nitric acid with an atom of hydrogen replaced by an nitric acid with an atom of hydrogen replaced or an atom of potassium. In like manner, sulphate of potash would be KSO, sulphuric acid HSO, and sulphuric anhydride SO. The theory is carried out in wonderful perfection throughout the series of organic acids: in fact, it was in investigating these that the theory was first conceived. Organic anhydrides bear the same relations to their acids that ethers bear to alcohols; that is to say, they differ by one equivalent of water. Acetic anhydride is formed by distilling anhydrous acetato of potash and oxychloride of phosphorus. It is a colourless mobile liquid, with a smell resembling, but still different from, that of acetic acid. On being thrown into water, it falls to the bottom in oily drops, which slowly dissolve, forming acetic acid. The annydride theory has been somewhat dwelt upon in consequence of Gerhardt's system growing daily more and more into use through the teaching of Hofmann, Prodic, Williamson, Odling, and other eminent chemists.

ANUXDRITE, in-hi'-drite (Gr. a, without, and udor, water), a mineral which consists of anhydrous sulphate of calcium. It has been variously denominated muriacite, tripe-stone, and anhydrite, according to its structure. Vulpinite is a siliceous variety, containing 8 per cent. of silex and having the bardness 3.5 (ac-cording to Dana's system of mineralogy). Crystal-lized anhydrite occurs in the salt-mines of Bex, in Switzerland, and at Salzburg, near Hall, in the Tyrol; also at Sulz, on the Necker, in Wintemberg; at Bleiberg, in Carinthia; at Luneberg, in Hanover; at Kapnik, in Hungary; at Ischl, in Upper Austria; and at Berchtesgarden, in Bavaria. The variety which bears the name of tripe-stone has been found principally at Wieliczka, in Poland. The vulpinite from Vulpino, in Italy, admits of being cut and polished for ornamental purposes. At Lockport, in the State of New York, it occurs of a fine blue colour in geodes of black limestone, accompanied with crystals of calcarcous spar and gypsum. Switzerland, and at Salzburg, near Hall, in the Tyrol;

in goodes of black limestone, accompanied with crystals of calcarcous spar and gypsum.

ANHYDROUS, ān-li'-drus.—Oxides and salts containing no water are said to be anhydrous. Water possesses the property of forming compounds called hydrates, with different salts and oxides. Thus we have hydrate of potassa, of lime, of oxide of chromium, &c. The sffinity possessed by many metallic oxides for water is so strong, that, when once the hydrate is formed, the water cannot be separated but by the addition of an acid. Caustic potassa, for instance, contains one atom of water which is not separated even by a red heat. (See Water.)

#### Anilic Acid

ANLIC ACID, än-v-lik.—Called also indigolic acid, on account of its being produced by the action of diluted nitric acid upon indigo. Carbonic acid is produced with it and remains in solution, the anilic acid separating it in light yellowish prisms, which are fusible and volatile. Anilio acid decomposes acetate of lead, forming with the lead 2 crystallized anilate.

ANILINE, an'-i-leen (Hindostance anil, indigo), Kx-ANTINN, an anterest (ninoseance ant, nongo), axanol, Phenylaming, Phenylat, or Chrystalline.
This compound, discovered as a product of the distillation of indigo by Unversorben, has of late received
great attention, from being the source of most of the
coal-tar series of dyes, of which mauve and magenta are familiar examples. Aniline, C.<sub>13</sub>H., N, is seelear transparent liquid, with an agreeable wine-like odour and a burning taste. It is very acrid and poisonous. It boils at 360° F. and freezes at 4° F. It is rather heavier than water, in which it readily dissolves. organic base, forming well-defined crystallizable salts with acids. It may be procured in several ways:—1. By acting on indigo with hydrate of potassa, and distilling the product. 2. It is contained in small quanti-ties in the products of the distillation of coal. 3. Nitrobenzols is converted into aniline and water by the action of acetic acid and iron, or some other deoxidizing agent. Aniline is very interesting from a chemical as well as a commercial point of view, the investigation of its properties having thrown great light upon many mysteries of organic chemistry. A short time since aniline existed only in a few laboratories in small quanthies; now it is manufactured in tons for the purpose of being converted into the various dyes. Watts, in his new Dictionary of Chemistry, thus describes its properties, according to the latest researches of chemists both in this country and upon the Continent: "Aniline is a non-conductor of electricity. Its vapour burns with a bright, but smoky flame. It exerts a burns with a bright, but smoky flame. deleterious action on the animal organism: half a gramme, with one and a half gramme of water, and sprinkled into the mouth of a rabbit, produced strong cramps, then laborious breathing, loss of strength, dilated pupils, and inflammation of the mucous mem-hrane of the mouth. Aniline disselves in all prebrane of the mouth. Aniline dissolves in all proportions in ether, alcohol, wood-spirit, acctone, sulphide of carbon, and oils, both fixed and volatile.

The aqueous solution has an extremely weak alkaline reaction, affecting only the most delicate test-papers; it does not blue reddened litmus or redden turmeric. but it changes the violet colour of dahlias to green. Aniline dissolves sulphur abundantly, also phosphorus, camphor, and colophony; but not arsenic, copal, or caoutchone. It produces a bright violet-blue colour with chloride of lime and other hydrochlorites, blue with sulphuric acid and acid chromate of potassium, and reds of various depth and brightness when heated with tetrachloride of carbon, stannic chloride, arsenic acid, fuming nitric acid, mercuric nitrate, and some acid, furning intre acid, mercuric intrace, and some other salts. It imparts a deep yellow colour to pine-wood and elder pith,—a character, however, likewise exhibited, though in a less degree, by other bases, namely, onine, cinnamine, leucoline, and naphthyla-mine. The squeous solution of aniline precipitates the bases from ferrous, ferric, zinc, and aluminium salts. With platinic and palladious chlorides it forms yellow double salts; with chloride of gold, a red-brown double salt; with murcuric, antimonic, and stannic chlorides, white double salts."

ANILINE DYRS .- The principal aniline dyes, or coalardyes, as they are often called, are manye, or Perkin's purple, magenta, red, or fuchsine, violine, and several others. Andline purple was discovered by Mr. W. H. Perkin, while endeavouring to form artificial quinine. On treating sulphate of aniline with bichromate of On treating supposes of annue with decironate or potash, he obtained a dense black precipitate, which, on further examination, was found to contain the purple in question in large quantities. This laid the foundation of the property of the latest the process of the latest the latest the latest the process of the latest the late dation for further researches, the result of which has white, yolk, and shell, into the flesh, blood, bones, and been the discovery of a series of the most eplendid dyes, constant in colour and brilliant in tint. Their commercial manufacture is briefly as follows:—Benton, direction, direction, direction. The principal chemical substances necessary for the support of the distinction functions of the animal system, are combined to form mitro-benzole, which, being acted on by acetate of iron, is resolved into aniline, water, and other compounds. Solutions of aniline water, and other compounds. Solutions of aniline water, and other compounds. Solutions of metals iron, solution, potassium, line, and magnulphate of aniline and bichromate of potash are dution for further researches, the result of which has

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mixed and allowed to stand until the precipitation of the black powder mentioned above is complete. The precipitate is thrown on a filter and washed. It is then digested in coal-tar naphtha, and afterwards in alcohol, which dissolves out the dye. Violine is formed nearly in a similar manner, by means of the combined action of sulphuric acid and oxide of lead. By combining sulphate of aniline and oxide of lead, roscine is formed. Buppase of smaller and oxide of read, roseine is formed. By substituting bichloride of tin, or nitrate of mercury, fuchsine, or magenta, is obtained. "Bleu de Paris" is made by altering the proportions of bichloride of tin, and performing the operation is a closed tube heated for thirty hours to about 400° P. It was long known to chemists that aniline compounds were capable of yielding coloured products with chloride of capable of Treating concurred products of Perkin who first succeeded in making the production of aniline dyes a commercial manufacture. The manufacture of aniline commercial manufacture. The manufacture of aniline colours in England is rapidly developing into a most important branch of commerce, and from the facility and cheapness with which coal products are obtained, there is but little doubt that we shall shortly become the colour-exporting nation of the world, instead of having to rely on Turkey and Holland for madders and other dye-stuffe.

ANILINE TEST .- A method of using aniline as a means of ascertaining whether or not the linen in any fabric is mixed with cotton, and, if so, in what pro-portion, has been made known-by Herr Böttger. At the corners of one end of a strip to be tested he loosens the threads, so as to expose both the warp and the woof. He then dips that end of the strip in an alcoholic solution of aniline red, washes it in water until the washings are colourless, and then places it in an aqueous solution of ammonia. Should any cotton be present, the ammonia will discharge the colour t without touching the colour of the linen por-The linen threads will remain of a bright rosetion. The linen threads will remain of a bright rose-red, but the cotton threads will become perfectly white—Ref. Michanics Mag., 1865. Chemisches Central Blatt, 1865.

ANILINE YELLOW .- Mr. Nicholson, whilst preparing aniline red, discovered, among other secondary products, aniline yellow, or chrysaniline, a very beautifut yellow colour. Dr. Hofmann, on examining the product, proved it to be a well-defined base. Aniline yellow is prepared in a very simple way. The residue from which the resultine has been extracted is submitted to a current of steam, when a quantity of the base passes into solution. This solution precipitates aniline yellow in the form of a nitrate. Aniline yellow and

its saits dye wools and silks a gorgoous golden-yellow tint. They have been used as printing inks, and found to be very permanent.— Ref. Watte's Dict. of Chemistry, Ure's Dict. of Arts, Mungfactures, and Mines, ANIMA MUNDI, and-i-mi mun'-di (Lat., son) of the world), in Phil., the name of a certain pure ethereal substance or spirit, held by some ancient philosophers to be diffused throughout nature, and to constitute the living principle of the world. This doctrine was held by the Stoics and Stratonicians, and is closely allied to pantheism. Plato and his followers believed in this anima mundi, but held that there was an infinitely pure and perfect being above it. Many philosophical and philosophico-religious sects have entertained the same opinion under different forms.

ANIMAL, an'-i-mail.—The law distinguishes animals into such as are domita and such as are fera natura, some being of a tame, and others of a wild disposition; the former consisting of such animals as we generally see tame, and are therefore seldom or never found wandering at large; and the latter of such as are

usually found at liberty.

ANIMAL CREMISTRY.—That branch of science which treats of the different changes going on in the living animal; such as the change of the egg, consisting of

## Animal Flower

form of food, and become distributed to the different parts of the body during the process of digestion and assimilation; as for example, the iron to the blood and bair, the lime and phosphorus to the nails and bones. If any of these substances are wanting, the system suffers, and they must be restored to the patient. For instance, rachitis, or rickets, in children is caused by the bone containing too little lime; and the best remedy therefore, in its earliest stage, is plenty of lime-water, or some other substance containing lime. The following analysis of different parts of the human system will be interesting, as showing the destination of these different substances :-

Bone.	HAIR.
Animal matter         31           Phosphate of line         59           Fluoride of calcium         2           Carbonate of line         7           Phosphate of magnesia         1	Carbon         51           Hydrogen         7           Nitrogen         17           Sulphur         3           Oxygen         22
BLOOD.	Flesh.
Water         779           Fibrine         2           Fatty matter         2           Albumen         69           Iron and salts         7           Blood corpuscles         141	Congulated fibre. Water, three-fourths. Albumen. Phosphoric acid. Phosphates. Chlorides.

The modern discoveries of animal chemistry have thrown great light upon the vital functions, and the laws governing them. The researches of Liebig and others have also tended to purge medicinal science of much of its rubbish, and prescriptions are now com-pounded by men knowing the chemical value of their ingredients. (See BLOOD, BONE, RESPIRATION, &c.)

Animal Flower, the gen Actinia. It bears some resemblance to a flower with a radiated disk; its tentacula are disposed in regular circles, tinged with a variety of beautiful bright colours, as the marigold, anemone, &c. (See Anemone, Sea.)

ANIMAL HEAT is that heat which is generated in the

bodies of living animals, by which they are enabled to maintain a certain temperature, independent of that of the atmosphere or other matinm by which they are surrounded. Heat is one of the conditions necessary to life, and, when that is reduced below a certain point, all vital activity ceases. The sun is the great source of heat, and on it vegetables and the greater number of tribes of animals principally depend. There are certain tribes of animals, however, especially birds and manuals, which possess the power of generating heat within themselves to such a degree as to render their vital functions almost entirely independent of external influences; and there is probably no species that can exercise this power more effectually and through a greater range of conditions than man. Judging merely from our sensations, we should be led to conclude that our bodies undergo very considerable changes of temperature. Such, however, has been proved not to be the case. From a series of 114 ob-servations made by Dr. John Davy on persons of different ages and sexes, and in various latitudes, it was found that the mean temperature of the body was 100°, in a mean atmospheric temperature of 74°; the highest temperature of the body being 102°, while the highest atmospheric temperature was 82°, and the nignest atmospheric temperature was 82°, and the lowest temperature of the body 98°.5°, while the lowest temperature of the individuals was 27°. In favourable circumstances, the temperature of infants is somewhat higher than therefore adults, but in the work of the somewhat higher than that of adults; but, in their power of resisting the depressing influence of external cold, the former are much inferior to the latter. External cold reduces the temperature of the body considerably, especially if at rest. Thus Dr. Davy found the temperature of his own body reduced, on an average of four observations, to 96.7°, with the average temperature of the surrounding air at 37°. An increase of temperature surrounding as at 37°. An increase of temperature takes piace after exercise, as well as after a meal. The usual temperature of the body occasionally undergoes considerable change in disease, from 106° in fever to 67° in cholera. The mean temperature of birds is rather higher than that of mammals, averaging about 108°,

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while mammals average about 101°. Animal heat arises from the various changes that are constantly going on within the bodies of the animals. Every change that takes place in the condition of the organic components of the body, in which their elements enter into new combinations with oxygen, is necessarily a source of the development of heat. By the union of the oxygen of the atmosphere with the carbon and hydrogen of the body, a species of combustion takes place, and heat is evolved. Hence We find that the more rapidly this combustion is carried on, the greater the amount of heat medical and honce a precisic increases the from the various changes that are constantly going on of heat produced; and hence exercise increases the heat of the body. Some have held that combustion was not sufficient to account for the total amount of best generated in a living body; but the most retent authorities are now generally agreed that such is the case, especially when we take into account the small case, especially when we take into account the small quantities of sulphur and phosphorus which also undergo oxidation within the system. But, while a low degree of heat destroys vital activity, not less destructive to it is a high degree of heat. By a wise provision, therefore, the body has the power of maintaining itself in a moderate state of heat, even when surrounded by a very hot medium. Thus Banks, Blagden, and Fordyce exposed themselves to a heat of nearly 260°, and found that their bodies had preserved nearly their own temperature. This is owing to the cutaneous and pulmonary evaporation which takes place. Animals placed in a hot atmosphere so satu-rated with humidity that no evaporation could take place, could not support a heat but little greater than

their own without perishing.

ANIMAL KINGDOM.—This term is commonly applied to one of the three primary divisions of Nature, the other two being called respectively the Vegetable kingdom and the Mineral kingdom. All organized beings are included in the first and second, and all inorganic bodies in the third division, This arrangement of natural objects into three great departments is very ancient; indeed, there is every reason to believe that it was one of the earliest classifications devised by the human mind. The general differences between aninuman mind. The general differences between amula, plants, and minerals are so striking, that they could not long have escaped the attention of wondering and thoughtful man. With the increase of knowledge, however, the line of domarcation between the two organic kingdoms has gradually been obliterated; and at the present time we may seek in vana for a character by which an animal may at once be distinguished from a plant. The mineral kingdom can easily be defined, as no inorganic body has the characters which we may recognize it any organized being. A plant or an animal, however lowly, may be distinguished from a mineral by its cellular structure. All its parts originate in and are formed out of cells (rec Cells); and each part so produced is dependent on the others. A mineral had is among to the contract of the colors of the colors of the colors of the colors. mineral body is merely an aggregate of homogeneous particles, and it has no special parts or organs. Again, a plant or animal exists as an individual being for a certain time, and has the power of producing other beings to take its place when that time has expired. A neings to take its place when that the has expect. As mineral, on the other hand, has no definite period of existence, but will remain unchanged as long as it in not acted upon by external forces sufficiently powerful to overcome the cohesion of its particles. The distinction between plants and animals, though evident enough when we regard those which are highly organized, is scarcely perceptible when we compare the lowest links of each chain of life. Indeed, many unpretending forms of life seem to occupy neutral ground, and may be claimed by the botanist and zoologist with equal right. Aristotle was the first naturalist who south the distinct a hateralists. who sought a distinction between plants and animals; and, in stating that an animal possessed a animals; and, in stating that an animal possessed as mouth while a plant had no such organ, he gave, perhaps, the simplest and most generally applicable definition that exists. The microscope has, however, quite upset the notion that the mouth is a necessary part of an animal. Linneaus attempted to define the three kingdoms by the following dictum:—" Minerals grow; plants grow and live; animals grow, live, and feel." To apply this definition, we must first define life and feeling; and this cannot be done in such a way as to effect the object of the naturalist. Curier thought the possession of a stomach a sufficient distinction for

the possession of a stomach a sufficient distinction for

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the animal kingdom; but, since his time, we have become acquainted with numerous microscopic creatures that have no special receptacles for food. Until very lately, chemical distinctions were much relied upon, as it was believed that the presence of cellulose (see this word) or of starch was a certain characteristic of a plant. This belief has, however, been proved to be erroneous by the discovery of these common vegetable constituents in the tissues of animals. Though we cannot give any absolute rule for distinguishing an animal from a plant, we can point to many striking differences between the two kingdoms, when we consider the functions performed by the members of each taken collectively. It is only in comparing particular individuals that we encounter difficulties. In a general sense, animals consume organic matter derived directly or indirectly from the vegetable kingdom, while plants obtain their nourishment from the mineral kingdom. Animals, by the process of respiration, absorb oxygen and breathe out carbonic-acid gas; while plants take carbonic acid from the atmosphere and climinate oxygen. Thus the great functions of animal and vegetable life are antagonistic, and between them the circulation of matter is constantly kept up. Other characters of a more evident kind may be given, by which animals may generally be distinguished from plants. Thus animals have the power of voluntary motion, and wander about in scarch of food, which they digest in internal cavities or stomachs. Plants, on the contrary, are stationary, and absorb the substances by which they are nourished through their external surfaces. These characters, as we have before stated, are not absolute marks of distinction; for there are many animals that pass their existence in fixed positions, and many that are stomachless; while, on the other hand, there are many plants which move from place to place, as if gifted with volition.

In studying zoology,—that part of natural history which treats of the structure, habits, and habitations of all animals, from man to the humblest animalcule, we find that a general plan or system underlies the innumerable diversiform beings included in the first kingdom of nature. To discover this plan has always been the highest object of the scientific naturalist, and the many beautiful schemes of classification which have been devised are the results of investigations undertaken with this view. A very cursory inspection of the forms and structures of the different tribes of animals which are constantly presenting themselves to our notice, might satisfy us, that amongst all there are resemblances and differences; between some the similarity being the prevailing feature, whilst between others the differences are most obvious. In a crude shape, zoological classification must have been employed by the earliest human inhabitants of the globe. first observers of nature must have seen that animals could be placed in natural groups, as the distinctions between quadrupeds, birds, fishes, and insects, are very obvious. Minor divisions must also have been made at a very early period; for instance, the division of heasts into herbivorous and carnivorous groups, and time of Aristotle, who has justly been termed the father of natural history, zoological classification was based upon obvious external characters, and was necessarily very imperfect. Aristotle's system was the first founded on the only sure basis—the organization or physiological character of each animal. His method has been followed by all his successors, but we need scarcely say that his classification no longer holds a place in zoology. Between the systems of Aristotle and Linneus, those of Alian, Pliny, Atheneus, Albertus Magnus, Belon, Gesner, Aldrovandus, Johnston, Ray, and Buffon, were auccessively introduced; but as all these have long since been discarded, we need not consider their respective merits. By Linnous the animal kingdom was arranged in six great classes; namely, Mammalia (sucklers), Birds, Amphibia (reptiles), Fishes, Insects, Vermes (worms). The primary distinctions between these classes are given in the following table:—

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Heart unilocular (one-celled). Blood cold, red. External gills ..... Fishes.

Heart unilocular. Circulating fluid cold, white. With antonne ..... Insects.

With tentacula ... Vermes.

The Linnman system gave place to that of Cuvier, which is now followed so far as it agrees with recent discoveries. By Cuvier the animal kingdom was divided into four sub-kingdoms—Vertebrata, Mollusca, Articulata, and Radiuta. Recent authorities have, however, divided it into five sub-kingdoms, by splitting the Radiata into two, and rearranging some of its constituents. The distinguishing characters of Cuvier's great divisions may be thus stated:—

Vertebrata.—The animals of this sub-kingdom are obaracterized by the presence of a backbone and bony skeleton. The blood is red, the heart muscular, and the mouth is furnished with two jaws, placed one either before or above the other. They have distinct organs of sight, hearing, and smell, situated in the cavities of the face, and they have never more than four limbs. The sexes are ulways distinct. In the nervous system we distinguish two great centres of power, the brain and spinal cord.

In the other three sub-kingdoms, which may be grouped together under the general head of *Inverts-brata*, we place all animals void of backbone and bony skeleton

Mollusca.—The animals belonging to this great group have no internal skeleton, the muscles being attached only to the skin, which constitutes a soft contractile envelope. The nervous system is contained within this general envelope, together with the viscers, and is composed of several scattered masses connected by nervous filaments. Of the four senses, only those of taste and vision can be distinguished, and the latter sense is frequently wanting. Snails, slugs, oysters, and mussels, are molluscous animals.

Articuluta.—The nervous system of the third type of animal life consists of two long cords running longitudinally through the abdomen, dilated at intervals into knots, or ganglia. The organs of taste and vision are usually well developed. The envelope of the trunk is divided by transverse folds into a certain number of rings, to the interior of which the muscles are attached. The trunk often bears on its sides articulated limbs, but is frequently unfurnished with them. Worms and insects are included in this sub-kingdom.

Radiata.—In the radiate type the organs of sense and motion, instead of being arranged symmetrically on two sides of an axis, are disposed in rays round a centre. There is no very distinct nervous system, nor are there any organs of particular senses. This sub-kingdom embraces all those animals known as zoophytes, the star-fishes, and other lowly forms of life. The following classification is taken from that given by Mr. Jukes, in his "Manual of Geology," and which was supplied to him by Professor Harley. The dassification of the menualis is that recently devised by

The following classification is taken from that given by Mr. Jukes, in his "Manual of Geology," and which was supplied to him by Professor Harley. The dassification of the mammalia is that recently devised by Professor Owen. In examining this comprehensive scheme, the student must be guarded against taking the arrangement as strictly a linear one. The highest animals are doubtless placed first, and the lowest last, and this idea of subordination runs throughout: but it is impossible to carry it out accurately in detail, since many of the orders should be arranged side by side, or, still more properly, in circles, in order strictly to express their mutual relations:

# SUB-KINGDOM-VERTEBRATA. Class I.-Mammalia.

Sub-Class—Placentalia.

Orders. Examples.

Quadrumana. Catarhini	Old-world monkeys.
Strepsirhini	American monkeys. Lemurs.
Carnivora.	Lion, wolf, hyena, weasel
Plantigrada	Bear, racoon, badger.

Bimania ...... Man.

THE DICTIO	DNARY OF
Animal Kingdom	Animal Magnetism
Orders. Examples.	Orders. Examples.
Artiodactyla. Nouruminautia Hippopotamus, pig. Ruminautia	Copepoda Cyclops, suctorial crustacea.
Little Cow. Cumer, Stag. Sneen, cow.	Ostracoda Cythere, cypris. Cirripedia Barnaeles.
erissodactyla,	Xiphosura King-crab.
Solipedia Horse. Pachydermata Rhinoceros, hyrax, tapir. roboscidea Elephants. jrenia Dugong, manatee. letacea Whale, porpoisc. heiroptera.	Class V.—Annulata.
roboscides Elephants.	Polycheta
irenia	l Oligochæta Earth-worm
heiroptera. Whale, porpoise.	I Discophora Leech
Frugivora Pteropus. Insectivora Bat, vampire.	Tardigrada Arctiscon. Sagittida Sagitta.
Insectivora Bat, vampire.	Class VI.—Scolecida.
nsectivora Hedgehog, shrew, mole- truta, or Edentata Sloth, armadillo, aut-eater- lodentia Rat, hare, squirrel, beaver,	Trematoda Fluke.
lodentia Rat, hare, squirrel, beaver,	Teniada Tane-worm.
porcupine.	Tennada Tape worm. Acanthocephala Echinorhynchus.
Sub-Class-Implacentalia.	Nematoidea
farsupialia Kangaroo, wombat, opos-	Turbellaria Pianaria.
fontremata Platypus, echidus.	Rotifera Rotifer, brachionus, lacinu-
	laria.
Class II.—Avrs.	Class VII ECHINODERMATA.
cansores Woodnecker cucken purent	Holothuridæ Sea-cucumber, trepang. Echinidea Sea-urchin.
Aptores Eagle, hawk, vulture, owl, cansores Woodpecker, cuekoe, parrot asseres Thrush, sparrow, swallow,	Ophiprida: Sand-star.
olumbæPigeon, dove.	Asteridea Star-fish. Crinoidea Feather-star, stone-lily.
allinæ Fowl, grouse, partridge,	Crinoidea Feather-star, stone-lily.
	Own Tr Story Tyrago
ursores Ostrich, emu, apteryx, bus- tard.	SUB-KINGDOM-MOLLUSCA.
malladaman a	Class I.—Cephalophoba.
almipedes Duck, albatross, gull, puf-	Dibranchiata Squid, argouaut, poulpe. Tetrabranchiata Nautilus. Pulmonata Suail, slug.
un, pencan.	Pulmonata Suail, slug.
Class III,—REPTILIA.	L'teropoda Uno, carmaria.
helonia Turtle, tortoise. roccodila Croccodile, alligator.	Gasteropoda diœcia, or Whelk, periwinkle, limpet, Prosobranchiata. cowry.
ACTUAL IAZBIG.	Gasteropoda monocia, or Tornatella, bulla, doris.
phidia Snakes.	Opisthobranchiata.
Class IV AMPHILIA.	Class II.—Conceipera.
atrachia Frog, toad.	Lamellibranchiata, or Ace- Cockle, mussel, oyster, ve- phala. nus, and all ordinary
turobatrachia Proteus, siren, phiomorpha Cecilia (blind-worm).	bivalve shells.
	Clacs IIIMOLLUSCOIDEA.
Class V.—Pisces.	Brachiopoda, or Pallio- Lamp-shell, crania, orbi-
ipnoi Lepidosiren. lasmobrauchii Shark, ray.	branchiata. eula, lingula. Polyzoa, or Bryozoa Flustra, eschara, retepora.
anoidei Sturgeon, lepidosten.	Ascidioida, or Tunicata Ascidia, botryllus, salpa.
arsinolognochii Peren, cod, salmon.	mild constrained
anoidei Sturgeon, lepidosten, leostoi Perei, cod, salmon, arsipolyanchii Lamprey, harygobranchii Amphioxus,	SUB-KINGDOM -CELENTERATA.
	Class I ACTINIZOA.
SUD-KINGDOMANNULOSA.	Aleyonaria Aleyonium.
Class I.—Insecta.	Zoantharia Sea-anemone, six-starred
	coral, beroe.
ymenoptera	Class II.—Hydrozoa.
europtera	Lucernaroida Sertularia, and similar zoo- phytes.
repsiptera Stylops.	Tydroida Medusa, bydra.
	Control of the Contro
	SUB-KINGDOM-PROTOZOA.
oters Wes the	Class I STOMATODA.
1.	NoctilucidaNoctiluca.
Class II.—MYRIAPODA.	nfusoria Paramœcium, vorticella.
ulagnatha Millingio	Class II.—ASTOMATA.
79 TET	Spongeadie Sponge, Forguiniders Rotalia podosaria
Ilmonata Scorpion.	Foraminifera
mpuipneusia Spiders.	regarinidæ Gregarina.
acheana Acarus,	For an account of the distribution of animals over
cnogonida Pycnogonum.	he globe, see Distribution of Animals and Phy-
	SICAL GEOGRAPHY. For the special distinctions of dif-
	ferent clusses of animals, rafer to each of the names
dophthalmia Lobster, crab.	ferent classes of animals, refer to each of the names given in the above table.
dophthalmia Lobster, crab. Iriophthalmia Isopods, amphipods, læmo-	ferent clusses of animals, refer to each of the names

rise to many very remarkable phenomens, has been rashly ascribed to a peculiar modification of magnetic force. Those few who have studied mesmeric manifestations in a scientific spirit have, however, very wisely discarded the term animal magnetism, as it pretends to define an agent that is at present quite incomprehensible. (Sci MRSMERISM.)

ANTHAL STRENGTH, the power which can be exerted by human beings, horses, oxen, &c., to produce certain effects, with or without the aid of machinery. Animal strength can be employed as motive power in different strength can be employed as motive power in different ways, but varies according to the conditions and circumstances under which it is exerted; and, although the powers of individual animals of the same species are yieldy different, it is important to gather general data, from which it may be ascertained what amount of work may be obtained from any animal agent with out injury to bodily health or powers, by undue fatigue or exertion. The greater the load an animal draws or carries, the less can be the speed with which it proceeds; and, conversely, the greater the speed, the less the weight an animal can bear. There must then be a certain weight which an animal can just set in motion or support, or which will exactly balance the motive of the animal, and there must be a certain speed power of the annual, and there must be a certain speed at which it can proceed without any burden whatever, which will be lessened in proportion to the quantity which it may be compelled to bear or draw. No useful effect, for a stance, can be obtained by allowing a horse to gallon at its atmost epical without rider or burden of any kind, or to be attached to a load which it can-not set in motion, or barely move. There must, then, be a certain relation between the speed and load which will give the greatest amount of useful work; and this will differ for different animals, and even for the same will differ for different animals, and even for the same animal under different conditions. In measuring the effect of action, Coulomb obtained his expressions of strength by multiplying the weight of the burden carried by the distance to which it could be conveyed in eight hours, that time being taken as the average duration of a working day. In determining comparative expressions of strength, care must be taken to adopt the same unit of weight and distance in all cases. The pound avoirdupois is generally taken as the unit of weight, while the unit of distance is either a foot,

yard, and foot, successively, as the unit of distance. 160×30×1 =4800 160×30×1760=8448000  $169 \times 30 \times 5280 = 25344000$ 

yard, or mile. For the sake of explanation, suppose a man to be able to walk 30 miles duly without any load. and his weight to be 160 lbs., we get the following sumerical expressions of his strength, taking a mile,

the result 4,800 indicating that his strength is equivalent to a motive power that would move 4,800 lbs. one mile in a day, or I lb. 4,800 miles in a day; the next showing that he can exert a force sufficient to move 8,418,000 lbs. one yard in a day; and the third a force that can move 25,344,000 lbs. one foot in a day. It has been found, however, that a man of average strength can carry 120 bs. 10 miles in a day, giving 1,200 as the expression of the useful maximum effect of a man's strength, taking a mile as the unit of distance, and neglecting the weight of the man. The strength of a horse is generally considered to be equivalent to the strength of expressions. of seven men, the horse being attached to a wheel such as is used for applying motion to threshing machines, cider-presses, &c., and the men working at a windlass; a horse exerting a tractive force of 125 lbs. for 24 miles in a day, would exert power equivalent to a machine moving 3,000 lbs. one mile in a day; but 33,000 is generally used to denote the average power of a horse, showing the weight in pounds that can be drawn one foot in one minute for eight consecutive hours; for Boulton and Watt determined that a horse can draw 125 lbs. 3 miles in one hour, giving 3,000 as the number of pounds thank one rile in one day, or 23, 1000 as the number of pounds of the propose of the number of pounds. drawn one mile in one day, or 33,000 as the number of pounds drawn one foot per minute for eight hours, by the following process:—

3000 (lbs. drawn 1 m. in 1 d.) × 5280 (feetin 1 m.) = 33000 480 (minutes in 1 day of 8 h.)

The following are the comparative estimates of the labour of animals, the effect of a man's labour being to benzoin.

taken as the unit, according to the calculations of massenfratz:—In carrying loads on a level surface, man and dog 1, reindeer 3, ass 4, horse 8, dromedary 25, camel 31, slephata 147; in drawing loads on a level surface, reindeer 0.2, dog 0.6, man 1, ass 2, ox 5.5, horse 7.

ANIMAL SUBSTANCES.—The animal substances used in manufactures are extremely numerous, and may be disjuted into edible, industrial, and medicinal. The

edible animal substances will easily suggest themselves to the reader. Those used in manufactures are wood, silk, hair, bristles, skins, furs, whalebone, feathers, oils, wax, tallow, horn, tortoiseshell, pearls, shells, corals, sponge, due, gelatine, ambergris, music, civet, animal blacks, lacs, and cochineal. Those used in medicine are not so numerous. The principal ones are, Spanish fly, sodiliver-oil, and a few others. For information on the subject of the source or manufacture of these different substances, consult the articles under their respective headings.

Animaleulum, a little animal).—This is a general term for animals so exceedingly minute that they cannot be studied without the aid of the microscope; such as the species of Infusoria and Rotatoria. (See INFUSORIA, PROTOZOA, ROTATORIA.)

ANIMALS, AGE OF. (See AGR OF ANIMALS:)
ANIMALS, CRUELTY TO.—Various statutes have been passed for preventing cruelty to animals. By the 12 & 13 Vict. c. 92, it is causted, that if any person shall cruelly beat, ill-treat, overdrive, abuse, or torture the animals therein enumerated (which includes all domestic animals), he shall forfeit a sum not exceeding the animals that the property of the property o domestic animals), he shall torrest a sum not exceed the sum, not £5; and if the animal be injured, a further sum, not the start of the sum or nerson injured. The exceeding £10, to the owner or person injured. The act also inflicts penalties in the case of conveying any such animal in such a manner or position as to subject it to unnecessary pain or suffering, and also in the case of bull-baiting, cock-fighting, and the like; and makes a variety of humane provisions for the regulation of the business of slaughtering horses and other cattle not intended for butcher's meat; and for providing cattle impounded, with food and water. The 17 & 18 Vict. c. 60, extends the powers of the former statute in the case of impounded cattle, and prohibits the use of dogs

case of impounded cattle, and prohibits the use of dogs for purposes of draught, under a penalty of 40s. for the first, and not exceeding 45 for any subsequent offence. ANIMALS, WORSHIP OF. (See IDOLATIK.)

ANIMALS, WORSHIP OF. (See IDOLATIK.)

ANIMALS, and i-i-me.—This substance, called also gum anime and East-Indian copul, is extensively used in the preparation of varnishes, and is supposed to be the produce of the West-Indian locust-tree, Hymenaca Courbarit. The resin which exudes from the piny dammar (Vateria indica) is sometimes confounded with subme.

Anime, an'-i-mai (Fr.), a term used in Her., to denote that the eyes of a rapacious creature are borne of a different tincture from the creature itself.

ANIONS, an't-t-one (Gr. ana, upward, ion, going), a term introduced by Faraday to distinguish the elements which go to the anode, or positive pole, in decomposing chemical compound by the electric current.

(See ELECTROLYSIS, CATHIONS.)
ANISE, in eez (Or. onison, Lat. anisum), an umbelliferous plant, cultivated in Egypt, Malta, Spain, and Germany, for the sake of its fruit, called anisced, which is extensively used for flavouring liqueurs and confections, and medicinally as a carminative. The botanical name of the plant is Pimpinella Anisum. Star or Chinese aniseed is the fruit of the Illicium anisutum, a small tree in the nat. ord. Magnolioceae. It has a a small tree in the nat, ord. Magnalacce. It has a starlike form,—hence its name, and a flavour similar to that of the common anisced. This is imported into Europe from China and Singapore. Oil of anisced is obtained by distilling the figuit, and even the stems and leaves, of the common anisc. For this, a similar product, yielded by the star anisced, is frequently substituted. The true oil and its substitute bave the aromatic properties of the fruits, and are employed for the same purposes.

the same purposes.

Anisic Acid, and sik, obtained, in almost insoluble crystals, by acting on oil of unise with nitric acid. It is easily soluble in ether and alcohol.

Anison, an is-is-oin, obtained by acting on oil of anise with sulphuric acid. It is analogous in properties

#### Anisol

Anisol, an'-i-sol, a colourless mobile fluid, pre-pared by distilling anisic acid with caustic baryta. It boils at 306° F.

Anisomerous, an-i-som'-e-rus (Gr. anisos, unequal, meros, a part), in Not., a term applied to a symmetrical flower, in which the number of parts in every whorl of organs is not the same, as in the flower of the sedum, which has five sepuls, petals, and carpels, but ten stamens. (See Isomemous, Flower.)

ANISOSTRMONOUS, an'-i-nos-tem'-o-nus (Gr. anisos, unequal, stemon, a stamen), in Bot., a term applied to a flower in which the stamens are not equal in number

to the sepals or potals. (See Isostemonous.)

Annals, an'-näis (Lat. annus, a year), a term usually employed to denote a plain narrative of historical facts, arranged under the particular years in which they happened. It differs from history, masmuch as the events are strictly arranged in the order in which they occurred, those of one year being completed be-fore those of another are begun. It differs also in being usually a bare narrative of events, without, as in history, the author's opinions and remarks being interspersed. Annals require brevity; history demands ornament. Annals may be said to furnish the elements or materials out of which history is composed.

Annatto, an-nad'-to, also called annotto and arnotto. An orange-coloured dve-stuff, obtained from the seed of the Bixa orellana, and brought to this country in rushes from South America. It is soluble in alkalies, by which means it is fixed in cloth. Nankeen is dyed with this substance.

Annealing, an-neelling (Sax. analan, to kindle or inflame), a process of gradual cooling, which is applied to glass and certain metals, to prevent them cracking or breaking under any sudden alteration of temperature. Glass vessels are often im-properly annealed by being cooled too quickly; hence they crack in all directions when hot water is poured into them. Good housewires should therefore bail all glass vessels, and allow them to cool very gradually, before using them for hot liquids. The glass beakers used by chemists are so perfectly annealed, that they may be removed from the fire and placed at once on a cold slab without cracking. Brittleness in glass and metals is evidently caused by an approach to the crystalline state, which is destroyed by gradual cooling. (Sec STEEL.)

ANNELIDA, ün-ne-li'-dü (Lat. annulus, a ring; Gr. eidos, form), in Zool., a division of animals of the worm species, first proposed for distinct classification by Cuvier, who attached such importance to the fact of their possessing red blood, that he placed them at the head of the articulate series, above the crustaceas, the arachidas, and the insects. It is, however, gene-rally agreed that the annellida represent but the larval condition of insects, and can hardly be regarded as higher in organization than the perfect insect. The name of the class is derived from anadas, a ring; because the animals arranged under this division unways have their bodies formed of a great number of small rings, as in the carth-worm. (See Earth-worm.) For the most part, the anselida are origarous. In their mode of life there is little variety: some live in fresh. others in salt water; some, like the hair-worm (Gordius), are amphibious. The body is divided into numerous segments, marked by transverse lines, and generally furnished with a series of bristly appendance. which serve as legs. The said bristles are usually sharp, and sometimes burbed, serving not only to attach the animals to soft substances, and to hold firmly on to rocks and other solid bodies, but to aid their movements through the water.

ANNIHILATION, an-ni'-hi-lui'-shun (Lat. ad. to, nihil nothing), the act of destroying or reducing any created being into nothing. It is opposed to creation, which is the making of something out of nothing. Much difference of opinion has existed on the subject of aunihilation. According to some, nothing is more difficult; it can only be effected by the infinite power of the Creator: according to others, nothing is more easy. The latter maintain that existence is a state of

# Annual Register

place in the bodies around us, are mere alterations of form, and not annihilation. According to Dr. Eurnet, the idea of annihilation arose from the Christian theology, and that, in its present sense, it was nuknown to the Hebraws, the Greeks, and the Latins. The ancient philosophers, in effect, deuted all antibilation, as well as creation, resolving all the changes in the world into new modifications, without supposing the production of anything new or the destruction of anything old. Some Christians half they cled will sent the sent that the control of anything old. thing old. Some Christians hold that Got will suni-bilate the souls of the damned after a certain period of punishment, and that this annihilation is the second death. That the buman soul is not subject second death. That the human soul is not subject to annihilation, but, after this life, passes into another state of existence, is a doctrine founded both on reason and revelation. There is, perhaps, no race, how ver savage or uncivilized, that has not some idea of a future existence. Without such a belief, the present state of man becomes inexplicable. He is endowed with faculties and capacities fitting him for a sphero of existence far transcending the present, which otherwise must have been created in vain; while the moral government of the world can only be understood by regarding it in connection with a future state of being.

Annihilator, Fire, an-ni-hi-lui-tor, in Mech. a machine for extinguishing fires, invented by Mr. Phillips, and bearing his name. It consists of a case containing water, within which is a smaller case filled with a mixture of chlorate of potash and sugar. Dipping into the latter is a small tube containing sulphuric acid. When this tube is broken, the chlorate of potash and sugar become ignited, throwing off large quantities of mixed gases which are non-supporters of combustion. The action is maintained by the water in the outer case becoming heated. The apparatus seems to be of great use in extinguishing flame, but appears to have no action on red-hot materials. It has been used with much advantage in extinguishing fires on board ship, when

applied at an early period.

Anniversally, an-ni-vert-soi-re (Lat. annus, a year, and versum, turned), is a term applied to the yearly return of any remarkable day. Literary and scientific associations usually celebrate the anniversary of their institution; and in domestic life it is usual to observe the birthdays of the different members of a family. The birthday of the reigning monarch is generally observed as a holiday. Anniversary Clays are festivals celebrated by the Romish church in honour of the Anniversary Clays are festivals

ANNO DOMINI, an-no dom'-i-ni (Lat., in the year of our Lord), a cern used in chronology to denote a year since the incarnation of our Saviour. It was first adopted in 525, and is usually contracted A.D. The period from the birth of Christ is termed the Christian or the Vulgar era. (See ERA.)
Annodated, an-no-dai'-ted, is a term used in Her. to

denote anything bent somewhat in the form of an S. The serpents in the caduceus of Mercury are said to be annodated or entwined about the muce or staff.

Annotation, an-na-lai'-shun (Lat. annotatio, from ad, to, and notatio, a marking), a term commonly used: in the plural, and applied to remarks, notes, or commentaries on certain passages of a book, designed to illustrate their meaning. An annotated edition of a work is an edition having such annotations.

Annual, an'-nu-al (Lat. unnue, a year), in Bot., a plant which passes through all its successive stages of development in a single year. Such a plant produces flowers and fruit only once, and perishes when its fruit has become ripe. A plant which springs from the seed one year, but which does not flower until the next year, is called a biennial; and a plant which lives for several years a perennial. The duration of the life of a plant is greatly affected by accidental circumstances; and an annual is frequently converted into a biomnial, and occasionally into a perennial. The annuals culti-vated in our gardens are very numerous, and many of them produce lovely flowers.

ANNUAL REGISTER is the name of a well-known annual publication, which first appeared in 1759, and which is still carried on. Various works of a similar nature violence; that all things are constantly striving to bid previously been published, as Boyer's Political return to their primitive nothinguess; and that it state of Europe, from 1711 to 1739; and the Mistorical Register was as it may, we know that the changes wee see taking projected by Robert Dodsley, the bookseller, assisted.

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### Annuals

by Edmund Burke, who for some years wrote the his-torical parative; and it is said that much of it was written from his dictation for about thirty years. In 1781 was published the first volume of the New Annual Register, projected and edited by Dr. Kippis; but it never attained the reputation of its rival, and came to a close in 1825. The Edinburgh Annual Register was commenced in 1868 and terminated in 1827. The hiscommenced in 1808 and terminated in 1827. The historical narrative was for some years written by Sir Walter Scott, and afterwards by Southey. A French Waller Scott, and anterwards by country. A French work, in imitation of the Annual Register, appeared at Paris in 1825, for the year 1818, under the title of Annualre Historique Universel, and is still continued; the last volume, which was for 1856, being published in 1861. The first volume of the Annuaire des Deux Mondes, in connection with the well-known review of that name, appeared in 1951. An American Annual Register is published at New York.

Annuals, the name of a class of books that were

for some years very popular in this country. They were usually of a light literary nature, tastefully got up, and illustrated with finely-engraved prints, and appeared about Christmas. The first of them, Forgatme-not, was began in London in 1822; and the following year two others, Friendship's Offiring and The Graces, and their appearance. The Literary Sourchir was commenced in 1824 by Alaric A. Watts, and was a great improvement upon its predecessors. The Keepsuke was commenced in 1827, under the editorship of W. H. Ainsworth. In 1829 no fewer than seventeen different annuals were published; in 1840 the number had dwindled to nine. Of the Literary Sourceur, ten vols. were published; of the Forget-me-not, twenty-two; the Keepsuke, the last of the race, appeared finally in 1856. The place of these annuals may be said to be now occupied by the illustrated editions of popular works, which many of the publishers bring out about Christians; but they have formidable rivals me-not, was begun in London in 1822; and the following out about Christmas; but they have formidable rivals in the Christmas numbers of All the Year Hound, the Christmas double numbers of the Illustrated London News and Queen, and the Christmas Annual, first put forth by Mr. Beeton. There indeed appears a possibility that these last fruits of publishing enterprise will usure the place of the "illustrated editions," or "table-books," just as the latter came to editions," or "table-books," just as the latter came to occupy the position left vacant by the old "annuals."

ANNUITY, an-nu'-i-te (Lat. unnus, a year), is a cortain annual sum of money, which may be paid annually or at certain fixed periods of the year, as half-yearly, quarterly, monthly, &c. There are various kinds of annuities, as for a certain number of years, for one or more lives, or in perpetuity. Deferred annuities are such as are not payable till after a certain period or event. From the great variety in the nature of annuities arise many complicated calculations in connection with them. An annuity is usually raised by the present payment of a certain sum, in consideration of which the person making the payment, or some one unned by him, becomes entitled to an annuity for a stipulated number of years, or till a certain event, which is usually the death of the annuitant. If money did not bear interest, the value of an annuity for a certain number of years would simply be the annual sum multiplied by the number of years for which it was to be paid,—as an annuity of £10 for ten years would simply be £100. But, while paying the annuity, the person engaging for it is drawing the interest of the price. Thus, if £100 were paid for an anality of £10, the interest being at 5 per cent., he would have the interest of £100 for the first year, =£5; the interest of £95 for the second year, =£4. 15s.; the interest of 4.93 for the second year, \$\tilde{L}\$. 15a.; the interest of 1899, 15a. for the third year; and so on. In this way, the present value of an annuity of £10 for one year (interest being at 5 per cent.) is £10, 10a. 6d.; for two years, £18. 11a. 10d.; three years, £27. 4a. 8d.; four years, £35. 9a. 21d.; five years, £24.5 fa. 11d.; ten years, £77. 4a. 6d.d.; twenty years, £12b. 12a. 15d.; for ever, £200. Where the annuity is dependent upon the life of an individual, the calculation is much more complicated. for here it becomes necessary to supertial into cated; for here it becomes necessary to assertain, not only the present value of the anuity, but also the probable duration of the life of the individual. Of ecurse, in the case of one person, he may die within the first year, or may live to extreme old age; but it is found that, where a number of persons are con-

### Anodyne

cerned, the average duration of life may be calculated with great nicety. Various tables of mortality have been constructed. The best known are the Northampton Tables of Dr. Price and the Carlisle Tables of Mr. Milne, the latter being regarded as the more accurate of the two. The government annuities are valued according to a table calculated by Mr. Finlaison from according to a same canadrated by BIT. Finiason from the mortality found among the different classes of go-vernment annuitants, and which distinguishes males from females. From this last we give the following table of the value of a life annuity of £1 at different periods of life, the rate of interest being 4 per cent.:—

Age.	MALE.	FEMALE.	AGE.	MALE.	FEMALE.
3	19.0660	19:8135	40	14.8752	16:1560
2	19-1912	19.8981	45	13.7975	15.2686
3	10.2642	19/9512	50	12.4299	14-1610
4	19:2880	19.9795	55	11.0392	12.7904
5	19:2699	20.0008	60	9:7207	11.2609
10	18:7817	19:7014	65	8-2163	9 5765
15	18:0044	19.0594	70	6.7745	7:8580
20	17:2048	18 6130	75	5 4103	6.2640
25	16.9400	18-1273	80 1	3.8117	4:9358
30	16:4438	17:5456	85	2.3495	3.7511
35	15.7488	16.8795	90	1.3346	2.1133
- 1		1 !!			1

Annuity (Lat. reditus annuus, an annual return or income), in Law, is a yearly sum, chargeable only upon the person of the grantor, and is distinguished from a rent-charge, which is a burden imposed upon or issuing out of land. Formerly, certain acts of parbiament imposed checks on the grant of life annuities, but they were repealed by 17 & 18 Vict. c. 90, which nevertheless provides for their registration in a mode similar to the registration of judgments to affect or charge real estate.

ANNULAR CELLS and VESSELS, an'-nu-lar (Lat. annuhandland the business and the state of a plant are made up of little membranous sacs and tubes called cells and vessels. These are often strengthened by delicate threads or bands called fibres, formed by secondary deposits on the inner surfaces of the primary membranes. When these fibres exist as places of When these fibres exist as rings or hoops, the cells and vessels containing them are said to

Annulata Sedentaria, an'-nu-lai'-ta sed'-en-tair'-i-a, a carnivorous tribe of worm-like animals, inhabiting a tube-shaped shell, which they never quit. They are usually found adhering to marine substances.

Annulate, an'-nu-lait (Lat. annulus, a ring), in Bot., a term applied to those ferns which have ringed sporangia (cases containing spores). The annulus or ring surrounding each sporangium is elastic, and its pressure causes the organ to burst when ripe, and release the spores. Those ferns which have sporangia not encircled by rings are said to be exannulate.

ANNULATED ROOT, an-nu-lai'-ted (Lot. annulus, a ring), in Bot., a root having a number of ring-like ex-pansions, so as to present the appearance of a string

of thick rings, as in the ipecacuanha.

Annunciation, ün-nun'-si-ai'-shun (Lat. annuntiare, to announce), the name of a festival celebrated March 25th, in commemoration of the announcement made 23th, in commemoration of the announcement made by the angel Gabriel to the Virgin Mary, that she was to become the mother of our Lord. It is also called Lady-day, and was instituted, according to some, in the 4th, according to others, not before the 7th century.

Ano., an'-o-a, a ruminating animal of Sumatra, but so imperfectly known, that reologists are undecided how it should be classed. Judging, however, from the unterials imported, merely a few bones and fragments of skull, it would seem to be a species intermediate between the buffulo and antelope.

Detween the busine and anetope.

ANORUM. (See DEATH-WATCH.)

ANOR, int-ode (Gr. ana, mward, odes, a way), a term introduced by Furaday to designate the positive pole of any electrical arrangement for decomposing a chemical compound. The snode, or positive pole, is the surface by which the electric current enters the body undergoing decomposition. (See Electrolysis, Cathode.)
Anodyne, an'-o-dine (Gr. a, without, odune, pain),

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### Anogens

a medicine which allays pain. The term is usually applied only to a medicine which acts upon the nervous system, so as to decrease sensibility and induce sleep, or a state of partial unconsciousness. The most important anodynes are preparations of opium. Anodyne pills, each consisting of one-eighth of a grain of sectate of morphia and half a grain of extract of hyosoyamus, have lately been extensively employed by medical prac-

ANOGENS, an'-o-jens, in Bot, this term has been used to designate a division of the vegetable kingdom, including the liverworts and mosses, which are usually

classed with the Acrogens.

ANOINTING, id-noind-ting, signifies the pouring on of oil, a custom which was, and still is, very prevalent in the East. The custom doubtless arose from the health and comfort which, in hot climates, result from the pouring or rubbing oils upon the person. The oils were usually highly scented. To anoint a guest was to show him one of the highest marks of respect. Among the Jews, anointing was considered necessary as the preparation of the person for rare and great occasions. It also denoted the consecration to a sacred office, as that of king or priest; and even vessels for the service of the tabernacle were anointed before being used. The custom of anoming priests still exists in the Roman Catholic church, and that of anomining kings in Christian monarchies. (See CORONATION.) The ancient athlets anomited themselves in order to render it more difficult for their antagonists to get hold of them. The anointing of oil was also regarded as a means of restoring the sick; and, in the present day, it is said to be of use in consumption, rheumatism, &c.

ANOLIS, or ANOLIUS, a-no'-li-us, a reptile peculiar to America, supplying in many respects the place which the chameleon occupies in the old world. The colour of the skin, especially that about its loose baggy throat, assumes an endless succession of ever-varying lines, as the animal is disturbed by love or anger. The anolis, however, is more slenderly built than the chameleon,



ANOLIS.

and more active in its movements. It varies from seven or eight inches to a foot in length, and is extremely tame and harmless. Its food consists of flies and other small insects. The head is long, straight, and flattened; the body and tail slender; and both are covered with small round scales, which give

both are covered with small round scales, which give the skin the appearance of fine shapreen.

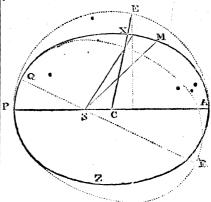
Anomalistic Year, in now!-a-lis-tik (Gr. anomalos, irregular), in Astron. the time which the earth takes in passing through its orbit from its perihelion, at which it is at its least distance from the sun, until it again arrives at that point. Under the disturbing influences of the planets, the perihelion of the earth advances 11"8 yearly, following the direction of the carth's path. In the figure, let 8 represent the sun, one of the coil of the allies described yound that hady by the path. In the figure, let S represent the sun, one of the foci of the ellipse described round that body by the earth, A the earth's aphelion, I its perihelion, at opposition of the ellipse described in the earth of the ellipse described in the ell carth, A the earth's sphelion, P its perihelion, at oppodrive extremities of AP the greater axis of the ellipse.

Now if the earth travelled round the sun in the fixed
path of the clipse PQAZ, it would accomplish its
revolution in 365 d. 54. 48 m. 49 s., the leugth of a solar
period of the clipse PQAZ, it would accomplish its
had a nature different from, and in nothing resembling
that of God; whereas the Semi-Arians held that there
resemblance between the two natures. The
war a resemblance between the two natures. The
anomeans were condemned by the Semi-Arians at the
council of Seleccia, D. 359; but the former averaged
the earth, atter passing from P over the whole path of
the ellipse until it arrives at P again, has to more over
the additional space PQ before it arrives at its perihestructure.

ANOMOTERIE, and—mop'-te-ris (Gr. anomos, without rule, pleris, fern). In Gool, this term is applied to

### Anomopteris

lion, or nearest point to the sun, now represented by Q. The anomalistic year is 25 minutes longer than a Q. The anomalistic year is 25 minutes rong, solar year, and 4 min. 10 sec. longer than a sidercal



ANOMALISTIC YEAR.

Anomalous, a nom'-a-lus (Gr. a, without, nomos, a rule), in Bot., this term is applied to all parts of a

plant when they have very irregular or unusual forms.

Anomaly, a-nom'-s-le (Gr. anomalos, irregular, unequal), in Gram, signifies an irregularity, as exception or deviation from rule. Anomalous verbs are such as are not conjugated conformably to the rules of their conjugation, as, lego in Latin, to give in English.

Anomaly, used in Astron. to denote the angle made

by lines drawn from the perihelion of a planet and its position in its orbit at any time, which meet in that focus of the ellipse described by the planet which denotes the of the empse described by the planet which denotes the position of the sun. Thus, in the figure in the article upon anomalistic year, X being the position of any planet in its orbit, P its perihelior, and S the sun, the angle PsX is the anomaly. This is sometimes termed true anomaly, to distinguish it from mean and eccentric anomaly. The true anomaly is the angle at the sun, between the position of a planet at any point of its between the position of a pianet at any point or us orbit and its perificion, the pianet moving in its orbit at a varying rate of speed, quicker when at its perificion, and slewer at its aphelion. Now the mean anomaly is the angle at the sun between the perificion and an imaginary position of the planet, being the place in its orbit where it would be, supposing it to place in its orbit where I would be, supposing it to move always at its mean or average speed, instead of the position it actually occupies at the same time, moving at its variable rate of progression; while the eccentric anomaly is the angle at the centre of the ellipse between the perihelion and a point in the cir-cumference of a circle described from the centre of the ellipse with a radius equal to half its greater axis, de-termined by a perpendicular drawn from the actual position of the planet to the axis, and produced to cut the circle. Thus in the figure, supposing X to be the position of any planet travelling at its variable rate of progression at any given time, and M the position it would occupy at the same time if it had travelled from its variable travelling at the position it would occupy at the same time if it had travelled from its perihelion at its mean speed, the angle PSX is the true anomaly, the angle PSM the mean anomaly, and the augle PCE the eccentric anomaly.

Anomeans, the occurre anomaly and differently, in church history, the name by which the pure Arians came to be distinguished in the 4th century. They were so called from their maintaining that Christ

a genus of lossil ferns peculiar to the new red sandstone. The plants differ from all recent and fossil ferns; hence the generic name, which signifies 'anomalous fern.'

Anona, a-no'-na, in Bot., the custard-apple, a genof plants belonging to the nat. ord. Anonaceae, and
composed of small trees and shribs growing in the
West Indies and South America, where they are cultirated for the sake of their delicious fruits. The most
important species are A. squamosa and A. maricala.
The first, commonly known us the sweet sop, is found
in all the West-India islands. The fruit is covered
with greenish scales, and has the appearance of a young
pine-cone. The chilbe portion consists of a thick,
sweet, and luscious pulp. A. maricala, the sour sop,
which is also a native of the West Indies, is a picturesque small tree, bearing a yellowish-green fruit,
weighing from I lb. to 3 lbs., and covered with weak
prickles. Its pulp is perfectly white, and has a most
agreeable acid taste. A. reliculata yields the netted
custard-apple, a large dark-brown fruit, filled with
yellowish or reddish pulp of about the consistence of
custard. A. cherimolia is cultivated in Pern, on account
of the excellence of its fruit, which is called the cherimolia. Two other important species have been described,—A. sylvatica (the Aratica do Muto of Brazi)
and A. palustris, both of which farnish light and bandsono wood, used for turnery.

some wood, used for turnery.

Anonacer, in-o-nuc-se-e, in Bot., a nat. ord. of dicotyledonous plants, of which the type is the gen. Anona. They are trees or shrubs, with leaves alternate, simple, and without stipules. In the flower we find a calyx of three sepals, and a corolla of six leathery petals, arranged in two whorls. The carpels age usually numerous, distinct or united; the stigmas simple, and the ovules inverted. The fruit is composed of a number of dry or sucenheu carpels, sometimes distinct, but oftener united, so us to form a fiesty mass. The plants of this order are almost entirely confined to the tropical regions of Asia. Africa, and America, none being found in Europe. They are generally aromatic and fragrant in all their parts, and some are very useful. (See Anona, Cellocline,

some are very useful. (See Anon., Chicolines, Duguria, Xilopia.)
Anonymous, & mod-i-mus, a term derived from the Greek, and signifying literally without a name, or nameless. It is applied to hooks which do not bear the name of the author. When an assumed name is given, the term pseudomymous is used. It is frequently a matter of importance in literature to know the author of an anonymous work; and hence several excellent works have appeared in Germany and France on this subject; as, Placcius "De Scriplis et Scriptoribus Anonymis et Pseudonymis Syntagma," Hamburg, 1708; and the excellent work for Barbier, "Dictionaire des Ouvrages Anonymes et Pseudonymoum," Hamburg, 1708; and the excellent work of Barbier, "Dictionaire des Ouvrages Anonymes et Pseudonymes," second edition, 4 vols., Paris, 1822-25, giving the names of about 24,000 works, with the kind of the second colleals, are anonymous, a system which, while it secures greater freedom to the writer, occasionally leads to abuse. The sending of anonymous letters demanding money or denouncing persons was made felony by 9 Geo. I. (1722), 8 Geo. IV. c. 20 (1827), and I Vict. c. 87 (1838).

ANOFDOTERICUM, \$\doldownohearrow\text{oplon}\$, weapon, \$\doldownohearrow\text{oplon}\$, beast), in Geol, a gen. of extenct quadrupeds, established by Cuvier from bones found in the Paris tertiaries. Several species have been determined, the smallest having been little larger than a guinea-pig, and the largest about the size of a small ass. From the situations in which their remains have been discovered, these ancient inhabitants of our globe appear to have lived in herds in swamps and marshes. They all had slender legs and icet, with but two toes, as in the ruminants, and were the earliest bi-hoofed animals known to have existed on the earth. In some the tail was short and thick, and was probably made use of in swimming; in others it was short and slender. The dentition of the genus appears to have been very peculiar, each jaw having had six incisors, on each side of which was a small canine, and behind these, without leaving any interval, seven molars,

resembling those of the rhinoceros. The common anoplethere (A. commune) has been taken as the type of a small natural family,—the Anopletheridae, which appear to form a connecting link between the pachyderus, or thick-skinned mammalia, and the ruminants. Cuvier, in describing this typical species, showed that in one respect it stood between the pippopetamus and borse, and in another, between the hippopotamus and camel. The restorations of the anoplotheres and other ancient animals, by this great comparative unatomist, from the mutilated remains found in the gypsum-beds near Paris, may be regarded as one of the most splendid achievements of paleoutology. The mane Anoplotherium, which signifies 'weaponless heast,' was given to the genus from the fact that all the species seem to have been destitute of organs of defence, as tusis, claws, or horns.

ANOPLULA, ōa-o-pla'-ra, a fam. of insects, in which are comprehended the Aptera of Linnaus and the many varieties of Pediathus (see Pedicturs), as well as the parasitic insects of other writers. About 500 different forms of Anoplura, all of them parasitical of them bearing a close resemblance to the human parasite, the louse, have been described. As a rule, only one species of anoplura attacks a single species of animal; but in engles and gulls as many as five different species have been discovered.—Ref. Denny's Anoplura Britannica.

ANORTHITE, an'-orth-de (Gr. a, without, orthos, right), a species of felspar, containing lime instead of potash combined with silicate of alumina.

ANSRLL'S FIRE-DAMP INDICATOR.—This ingenious instrument, which is founded upon the laws which govern the diffusion of gases, is intended to make known at a distance the presence, in a coal-pit, of fire-damp—the miners' deadliest onemy. The instrument consists of a small india-rubber balloon, filled with atmospheric air, and fixed under a lever. This lever is connected with a galvanic apparatus in such a way that a very slight motion will either make or break the circuit. If this apparatus be placed in an atmosphere containing a dangerous percentage of coal gas, the gas will rapidly permeate the atmospheric air in the balloon, distend it longitudinally, press upon the lever, and thus set the bell ringing on the spot, and, by means of the galvañic apparatus, another in the manager's office. The bells go on ringing so long as there is any fire-damp in the part of the mine at which the apparatus is placed. Mr. Ansell has also invented a form of apparatus for giving immediate warning of sudden irruptions of fire-damp.—Ref. Mechanics' Mayazine, 1865.

Ansers, an'eserve's (Lat. auser, a goose), the third order of the Linnman class Ares, thus characterized:—A smooth beak, covered with skin, gibbous at the buse, and broader at the point; feet formed for swimming, having palmated toes, connected by a membrane; the legs thick and short; the body bulky, plomp, and downy. Food—fishes, frogs, aquatic plants, &c. (See Goose.)

Answer, in sector (Etym. unsettled; Gothic, audsver; Danish, answere or answarer; Sax. anshairan; to reply to a question, objection, or assertion; to justify), in Law, is a pleading or reply, whereby an allegation in a bill of complaint in chancery, or inquiries arising thereout, or in a libel or articles in the ecclesiastical and other civil courts, is or are replied to or rebutted. In chancery, the interrogatories were formerly included in the bill; but now the practice is for the planniff to exhibit separate interrogatories, which the defendant is bound to answer upon eath, or, in the case of a peer or peeress, upon honour; and the party may be called on to answer viva core (except in criminal cases), or on interrogatories exhibited. But in no case can a man be compelled to give an answer which might criminate or degrade him. And any party to a suit may put forth interrogatories to be answered by any one or more of the others.

ANT, ant (Lat. Formica), a well-known genus of hymenopterous insects, which from the very earliest period of the world's history have attracted attention on account of their social and industrious habits, their love of order and subordination, and unremitting economy. They are distinguished from other Hymenoptera by their habit of residing underground in numerous societies, and by the existence of neuters among them, ny which class the laboure of the community are chiefly performed. Although so small, their muscular strength is extraordinary, and they will carry loads at least tentimes their own weight, displaying meanwhile considerable society. They have a triangular head; the antenne are geniculate; the jaws strong; the ligula, or lower lip, small, rounded, or spoon-like; the thorax compressed at the sides; the abdomen nearly oval, the pedicle which joins it to the thorax forming in some kinds a single and in some a double scale or knot. A community of ants, whatever the species may be, consists of males, which have always four wings; of females, much larger in size than the males, which only possess wings during the pairing season; and of a sort of barren females, which have been variously termed neuters, workers, or nurse-ants, and which, so far as is known, have never been observed to have wings in any stage of their existence. The nests of ants are differently constructed in the different species; all, however, are very curiously and regularly arranged. "If an antill be examined any time after midsummer up to the close of suturn, there may be seen mixed with the wingless workers a number of both males and females furnished with white glistening wings. These, however, are neither kings nor queens in the state, at least so far as freedom of action is concerned; for they are not allowed to more without a guard of workers to prevent them leaving the boundaries; and, if one straggles away unswares, it is for the most part dragged back by the vigilant sentinels, three or four of whom may in such cases be seen huning along a winged deserter by the wings and limbs. The workers, so far from ever facilitating the exit, much less the departure of the winged ones, more particularly the females, gnard them most assiduously in order to prevent it, and are only forced to acquiesce when the winged ones become too numerous to be either gnarded or fed. There seems, indeed, to be a



(MAGNIFIED, WITH EFD OF CLAW MORE HIGHLY MAGNIFIED.)

The actual pairing does not seem to take place within the ant-hills; and we have observed scouts posted all around ready to discover and carry back to the colony as many fertile femples as they could meet with. Nay, we are quite certain that whole colonies have thus been

dispersed; and, when they did not find ferrile females near their encampment, they have gone farther and farther, till they found them; and, if they had gone very far, never returned, but commoned a number of new establishments, according to their convenience. It is probable that, soon after pairing, the males die, as do the males of bees and other insects; for, as the workers never bring any of them back nor take any notice of them after leaving the ant-hill, they must perish, being entirely defenceless, and destitute both of a sting and of mandibles to provide for their sustenance. It was supposed by the ancients that all ants at a certain was supposed by the ancients that an interest is certain age acquired wings, but it was reserved for the younger Huber, is particular, by means of his artificial formicaries, to trace the development of the wings in the female, from the first commencement till he saw them stripped off and laid aside like cast clothes."—(Broderig.) The eggs of ants are so small as to be sourcely visible to the naked eye. Contrary to what takes place in most insects, the eggs when laid are not glued to any fixed place, but are dropped at random by the mother in her progress through the nest, and carefully collected by the workers, several of whom sedulously attend her by the workers, several or whom sequences are taken to the various apartments of the nest adapted for the purpose, and there left for hatching. Heat being indispensable, the eggs are placed carefully during the day near the surface of the ant-hill, but so sheltered from the direct influence of the sun, as to prevent the too rapid evaporation of their moisture. As night approaches, the experienced insects to whom the cure of the precious ova is intrusted, remove the eggs to warmer quarters, to prevent the escape of the heat they naturally possess. Nor does the care of these tender nurses cease when the little ants come into life. At night they are carefully stowed away in the innermost chambers of the nest, every aperture being closed to prevent the ingress of cold air. But as soon as the rays of the morning sun fall upon the surface of the nest, the workers busily commence carrying their infants to the upper chambers, where, close under the root, they may enjoy the genial warmth. Not unfrequently, they even place them for a time on the outside of the nest, exposed to the direct rays of the sun. During their grubhood, the little creatures are fed by the nurses, or by the mother herself, by a liquit disgorged from the stomach. When the grubs are full grown, they spin coccons of a membranous texture, and of a brownish-white colour, in appearance not unlike barleycorus, for which, indeed, they were mistaken by early observers. Hence, doubtless, arose the belief that the insect laid up a store of grain in the summer season, to serve for its support in the winter. It is certain, however, that our European acts are carnivorous in their habits. Says the Rov. J. G. Wood: "Ants do not, as has been frethe Rov. J. G. Wood: "Ants do not, as has been frequently said, lay up stores of corn for the winter, for they are in a state of torpidity during the winter months, and require no food. Moreover, an ant would find as much difficulty in eating and digesting a grain of corn as we should in devouring a truss of straw." Colonel Sykes, however, observed an ant in India that laid up a large store of millet-seed; and it is possible that other species may have the same habit. The avegatable substance which arts approachies to The vegetable substance which ants appear chiefly to use as food, is sugar, and to this, wherever it is to be found, they seem to be guided by a very scute sense of smell. Honey-dew, the saccharine excressence of the aphides, is a favourite food of many species. Not only do the ants climb plants on which aphides are to be found, but should they find the creature and not be round, our should nev and the creature and not his accularine produce, they will, with their antennas, pat the aphis on either side of the abdomen until the desired drop is yielded, and them pass on to snother. Linnæus quaintly styles the aphis the ant's mile-com. It is even related that the ant seems to regard the aphis as the partial or prepared to aphis as his particular property, and is prepared to do battle to the death with any other ant that seeks to dispute its title; and that the Aphie radicina, which derives its food from the roots of grass and other plants, is not uncommonly taken into custody by the yellow aut (Formica flava), and maintained in its nest, yeard watt [Formeta junua], and manusanea are usus, as a farmer might procure a herd of sows and house them in his sheds. That these stories are beyond distinct pute is not insisted, still, when the wonderful instinct of the ant is considered, it is too much to reject them

Ant as altogether incredible. Indeed, it should be sufficient to flud Huber among those who mention this farmer-like habit of the aut, to entitle the statement to serious consideration. The habitations of anta are very curiconsuceration. The nativations of same are very currously constructed, and display great ingentially. House built by the common wood-aut (Formica rufa) are sometimes as large as a small haycook. They are generally found in the vicinity of some large tree on the bank of a stream; such a site affording them both the solution and the same of the built. the bank of a stream; such a size affording them both food and the moisture requisite for building purposes. The ant-hill is of a conical shape, and composed of leaves, scraps of wood, earth, &c. - At the commencement the nest is simply an excavation made in the earth; a number of the labourers wander about in quest of materials suitable for the superstructure, othersecarry out particles of earth from the interior. which sire replaced by the bits of wood and leaves other labourers bring in, and which the builders pro-perly arrange. Care is taken that space is left for the galleries that lead to the interior, while the dome contains a number of spacious spartments communicating with each other by means of galleries similarly con-structed. To the superficial observer the exterior of an ant colony presents the appearance merely of a careless heap, the result rather of chance than of design. Minute inspection, however, would invariably discover it to be the very perfection of architecture, in which the attacks of enemies, the effect of wind and flood, and the rays of the sun, have been thoroughly provided against in the building. Ants are very pugnacious, and often fight fiercely. Party meets party, nacious, and often fight fiercely. Party meets party, and after the fray may be found limbless trunks, and trunkless heads, and combatants fast locked in each other's embrace, and quite dead. More extraordinary than all, however, is the fact that some species of ants go on regular forays to carry off the eggs and grubs of other species, which they carry into captivity, and rear as bond ants and slaves for the rest of their lives. The best known of these marauders are the Sanguinary Ant (Formica sonquinea) and the Amazon Ant (Formica rufesoens). It has been noticed as a rather singular circumstance, that in both cases the kidnappers are red or pale-coloured ants, and the captives jet black. The tyrants march forth attended by scouts, and when the unsuspecting colony of negro ants is reached, there ensuses a tremendous fight, in which the negroes are certain to be worsted. Thereupon, the conquerors assail the now undefended aut-hill, rend its walls with their powerful mandibles, seize the pupe in their mouths, and march home again in triumph. The slaves are not ill-treated, but live as do human slaves, the only reward for the labour of their lives being such food and lodging as their masters please to bestow .-- Ref. Gould's English Ants; the works of Baron de Geer, Huber, Latreille, Kirby and Spence's Entomology, &c.

ANT, WHITE, in Zool., an extensive and important fam. of the Neuron and

ART, Water, in Zool., an extensive and important fam. of the Neuropterous ord., chiefly confined to the tropics, where they perform no inconsiderable share in the necessary business of removing from the earth's surface the carrion that cumbers it. Like the common ant, the white ants live in communities, and are, like them, omnivorous. Like the familiar "little brown ant," too, the white tropical insect is, at a certain period of its existence, furnished with wings to expedite its amigration. At no time, however, does the general form of the two insects agree. The autenms of the white ants are thread-shaped, and composed of about twenty joints, and the eyes are rather small, but prominent; the body is depressed, and the mouth very similar to that of the Orthoptera, with the four-eleft lower lip, the wings alightly transparent, and the legs short. As destroyers, they certainly deserve place eaxt to the locusts. Should they attack a building composed wholly or partly of wood, it is doomed;—truly, when they leave it, as being of no further use to them, it will not have altered much in appearance; but examination will discover the substantial beams to the mere shells, and the pillars as hollow and unstable as reeds. Your gun that haugs against the wall will drop barrel from stock at the slightest handling, and your sword show itself naked, through its leather sheath being eat up. Nothing is safe from the white shrets insatiable appetite. Their tactics in attacking a building are very peculiar. While some of them are busy gutting the timbers that support it, others ascend from

them, entering a rafter or some other part of the roof, in search, as it would seem, of the thatch, which they appear to relish more than any other portion of a house. If they find it, they bring up wet clay, and build galleries through the roof in various directions as long as it will support them. In this manner a wooden house it speedily destroyed, and all that is contained in it is, at the same time, subjected to their ravages. Those won-derful edifices known as ant-hills are built of earth or sand agglutinated together. When Dr. Livingstone was engaged in his first African exploration, he witnessed several instances, not only of this mysterious insect architecture, but also of the important part they play in the scheme of nature. He tells us that the country between Linyanti and Seshella is flat except patches elevated only a few feet above the surrounding level. "There are also many mounds, where the gigantic ant-hills of the country have been situated, or gigana ant-mis of the country use open structed, or still appear. These mounds are evidently the work of the Termites. No one who has not seen these gigantic structures can fancy the industry of these little labourers. They seem to impart fertility to the soil which has once passed through their mouths; for the Makolo find the sides of the ant-hills the choice spots for rearing early maize and tobacco. In the parts through which we passed, the mounds were generally covered with wild date-trees." The fecundity of the female of this species is truly wonderful. She and her partner are incarcerated in a cell by the neuters, and are there regularly supplied with food; and, after impregnation, on the enlargement of the evaries, her abdomen swells to the enormous size of nearly two thousand times the rest of her body. As soon as she begins to lay eggs, they are conveyed away by the neuters to the prepared cells, which, in conjunction with the magazines of provisions, occupy the interior of their nests. It is said that she lays as many as 80,000 of these eggs in the course of twenty-four hours. So marvellous a fecundity would speedily overnours. So marvenous a lectuality would speedily over-whelm the earth, did it not happen that-comparatively few reach maturity, and that birds beasts, and fishes devour them in shoals. The true ants, however, are their worst enemies, and prey on them with the most savage voracity, especially at the period of their swarming. When roasted, they are said to be palaswarming. When roasted, they are said to be pass-table as food, and as such to be highly esteemed by the natives. A Bayeye chief, who paid a ceremonial visit to Dr. Livingstone's camp, was offered some bread and apricot jam. "Did you ever est anything so good?" inquired the doctor. "Ah!" responded the chief, "you should try roast white ants."

ANTACID, intras-id (Gr. onti, against, and acid), a term applied to such medicines as possess the quality of correcting acidity or sourness in the stomach. The principal antacids are potash, soda, magnesia, lime, and their carbonates.

and their earbonates.

Antagonist Muscles, in-ligi-o-nist (Gr. anti, against; against; againstes, a combatant), in Anat, are those muscles which act in opposition to each other; as flexors and extensors, abductors and adductors. In the arm, for example, the flexor muscles bend the limb back or extend it in a direct line. The lexor and extensor muscles set antagonistically towards each other, not in efforts at simultaneous and contrary action, but in consecutive action of an opposite direction. There is, however, a sort of passive action in the different muscles of the body, constituting what is termed the natural tone of the system; and when this is lost or partially enfeched in one set of muscles, their natural antagonists have an undue position of the natural balance. The form and position of the muscles of the face, for instance, keep up a balance of feature in the natural expression of immobility or stillness; those of one side antagonist those of the others. In paralysis of one side of the face, the muscles of that side are deprived of their natural tone and power of action, while those of the other side of the face retain their tone and power as before; the consequence of which is, that the latter draw the month to their side of the face, while the others are unable to counterbalance this action by their want of tone and power to act in the opposite direction. These muscles hence possess a counterbalancing power,

#### Antalgic

active in a state of immobility, and a moving power in opposite directions during the movement of the parts to which they are fixed.

parts to which they are fixed.

ANTAGEC, da-till-jik (Gr. anti, against, and algos, pain), in Med., a term applied to that which relieves pain.

ANTALKALI, "int-" all-" k" - l" (Gr. anti, against, and alkali), a name applied to such medicines as tend to counteract the presence of alkalies in the system. The antalkalies in most common use are muriatic, nitric, and eitric acid.

ANTINACLASTS, änt'-ăn-ă-klai'-sis (Gr. antanaklao, I. driva back), în Rhet., is a term denoting the repetition of a word in a different sense, or as a different part of speech, from that in which it has already been employed, in order to attract attention or give expressiveness to the phrase; as, "Whilst we like, let us like." It is also the returning to a subject after a long parenthesis, by repeating, in the same words, part of what went before.

ARTANAGGE, ant'-an-a-gaje (Gr. anti, against, and anagoge, the bringing up), a figure in Rhet, applied to the case of an opponent, when not able to answer the accusation of his adversary, replying by accusing him of the same or other crimes. It is usually called recrimination.

ANTARCHISM, anti-ar-kism (Gr. anti, against, and arche, government), an opposition to all government or legal restraint.

ANTARCTIC, àn-tark'-lik (Gr. anti, against, or opposite to, and arktos, the Bear, or northern constellation), an expression applied to the south pole and Southern Ocean, as opposite to the north pole and Northern or Arctic Ocean, and especially to the region which lies around the antarctic or south pole, within a circle distant 23° 28' from that pole; corresponding to an area similarly circumscribed which surrounds the north or arctic pole.

ANTARES, &n-tair'-ces, a bright double star in the constellation Scorpio, marked a, and known as Corsorpii, the Scorpion's heart. It is remarkable for its brilliant red appearance.

ANTE, an'-te, a Latin preposition signifying 'before,' and much used in the composition of English words. In composition it signifies before, either in place or in time. The Greek preposition anti is likewise frequently used in composition, and denotes against, opposite, contrary to.

ANT-EATER, GREAT (Myrmecophaga jubula of Linneus).—This curious creature, sometimes called the ant-bear, is an inhabitant of most of the tropical parts of South America cast of the Andes. It is the largest of the edentata, measuring four feet and a half from the tip of the snout to the root of the tail; while the latter member measures nearly three feet in length. These, at least, were the dimensions of the foll-grown female lately at the Zoological Gardens. The head of the great ant-cater extends to a long snout covered with skin, with only a very small opening at the tip for the protrusion of the tongue: its legs, especially the anterior once, very stout and strong, and armed each with four long claws, which turn inwards against the sole of the foot. The hind feet are provided with a broad sole, and it is probably from this circumstance that the anical derives its occasional name of ant-bear. The body is covered with bristly hair, which, on the tail, grows to such a length as to sweep the ground. When composing itself for sleep, the ant-cater curls its body, and so enwraps itself in its bushy tail, as to present the appearance of a heap of withered grass rather than a living animal. It is said that the animal resorts to the shelter of its tail as a protection from the rain, and that the Indians, on overtaking this sort of game, make a rustling among the forest toliage, to resemble the pattering of rain; whereon the ant-cater hasters to wrap itself in its tail, rendering it an easy matter for the stealthy savage to approach and knock it on the head. This precaution is not unnecessary; ior, despite the mimal's harmless appearance, it has a habit of suddenly rising, bear-fashion, and classing its sassilant round the waist, lacerating him rearfully with the power and classing its powerful claws. The natural food of the ant-cater is the white ant that abounds on the banks of lakes.

#### Antelope

nests of the industrious little insects with its heavyarmed fore-paws, it puts the entire colony in confusion, and then thrusting amongst them its nimble tongue, capable of protrusion to the extent of a foot and a half, withdraws the adherent ants into its maw, repeating the operation till they are all consumed, or the ant-cater's appetite satisfied. The ant-cater's tonguo is composed almost solely of ring-like muscles, and is



ANT-RATER.

altogether worm-like in appearance. The surface is endued with a viscous matter, to which the ants and termites become helplessly attached at the slightest contact. Without this providential arrangement, the animal would find subsistence next to impossible, as its mouth is extremely small, and it possesses no teeth. The latter is the case with the majority of the edentata.

ANTECEDENT, ün'-te-ne'-dent (Lat. ante, before, and cedo, I go), in Gram., is the noun which goes before the relative, and to which it refers. In Log., it is that part of a conditional proposition on which the other, which is called the consequent, depends. In the relation of cause and effect, the cause is the antecedent, the effect the consequent.

ANTEGEDENTIA, in the two distributions of any heavenly body appears to be in a direction contrary to the course of the signs of the zodiac, or from east to west, it is said by astronomers to move in antecedentia.

ANTECHAMBER, and te-chaim-ber (Lat. ante, before; Fr. chambre, room, apartment), literally the room before the chamber; that which leads to the principal apartment.

ANTEDILUVIAN, ŏu'-te-di-loo'-vi-on (Lat. ante, before, and .tiluvium, a flood), a term applied to whatever existed or happened in that period of the world's history which preceded the Flood. The length of this period is variously given. According to the Hebrew text, it comprised 1,656 years, being only 692 years less than the period from the Flood to the birth of Christ, or 206 years less than that from the birth of Christ to the present time. The Samaritan and Septuagint texts, and Josephus, however, according to Hales and Jackson, make it no fewer than 2,256 years. All our authentic information respecting this long and interesting period is contained in forty-nine verses of Genesis (iv. 16 to vi. 8), more than half of which are occupied with a list of names and ages, invaluable for chronology, but conveying no particulars regarding the primoval state of man.—Reg. Kitto's Biblical Cyclopadda.

the shelter of its tail as a protection from the rain, and that the Indians, on overtaking this sort of game, make a rustling among the forest toliage, to resemble the pattering of rain; whereon the ant-eater hastens to wrap itsel in its tail, rendering it an easy matter for the stealthy savage to approach and knock it on the head. This precaution is not unnecessary; for, despite the animal's harmless appearance, it has a habit of suddenly rising, bear-fashion, and clasping its massailant round the waist, locerating him earfully with sassailant round the waist, locerating him earfully with the powerful claws. The natural food of the ant-eater is the white ant that abounds on the banks of lakes and rivers in tropical South America. Assailing the

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# Antelope

remarkable for their delicate sense of smell. It has been supposed that this is owing to their possession of "lachrymal sinuses," or "tear-pits," and that these organs communicate with the nostrils. The anatomy of the parts fully proves that this theoryis incorrect, and that there is no internal communication between the lachrymal sinus and the nose. Although the antelopes are not the only animals which possess suborbital sinuses, they are the only members of the hollowhorned family that exhibit this character. The females are furnished with two and sometimes four teats, and the period affects and sometimes four teats, and birth. From the most remote ages, the eyes of this genus have been a peculiar theme. The Greek and Roman name of the gazelle, dorcas, is derived from the verb derkomai, I see. Even the English name of the genus, antelope, is a corruption of the term antholops, literally 'bright eyes.' We are, moreover, informed by Bochart, that the Scriptural name, tabitha, is derived from tzeli, the Heirew name of the gazelle, which alludes to the brightness of its eyes. The same image is



frequently employed by Eastern poets, and also by our modern versifiers, the soft and subdued beauty of the gazelle's eyes often being compared to those of the timid and blushing maiden. As a rule, the hab of the antelope is smooth and short, and of an equal length; but, in some species, they have manes on the neck and shoulders; others, as the gau, are provided with a beard on the throat and chin. The cars are long and pointed, growing in the inside of which are long white bairs, forming five longitudinal lines, with four black spaces between. The tails are short, tufted at the extremity. This genus, as a rule, is gregarious, uniting in large flocks of thousands; but, in some instances, spending their lives in solitary pairs. When associating in large numbers, great caution is taken to prevent surprise, and sentinels are constantly kept on the nlert. Their wariness in this particular, combined with their acute sense of smell and sight, renders them somewhat difficult game, tasking the patience and temper of the hunter to the fullest extent. The hunting-grounds of Africa contain the largest number of these animals, Asia furnishes several species; Europe supplies but a small quote; and the gignitic extent of pasture-land in the New World can boast of but a single species. Australia and Madagascar are totally destitute of antelopes, as of all indigenous ruminants. With regard to the habitat of the antelope, it is far from a uniform nature; the general characteristics are as variable as the structure of the animals. While some species delight in the parched and arid desert, feeding upon such bulbous plants as the nature of the soil affords, others find a home on the open plains, on the steppes of Central Asia, or karroos of Southern Africa. Another species prefers the mountainous districts, and exhibits all the ease and sgility of the wild goat in their rocky home.

## Antholmintics

The dense and mighty forests of tropical Africa pro The dense and mighty forests of tropical Africa provide a home for some other species. The whole of the antelopes were at one time included under the general head Antilopea. Modern discoveries have so largely augmented the group, that it has been necessary to class them into subdivisions, as follows:—I. True antelopes; 2. bush antelopes; 3. capriform (or goat-like) antelopes; 4. bovine (or ox-like) antelopes. The two great divisions into which they are divided are, the antelopes of the field and the antelopes of the feed. desert. They are principally distinguished in the former by the absence of hair on the nostrils, whilst the same organs of the latter division are covered within with hair or bristles. It is true, the subdivisions have been quadrupled by modern zoologists; but, as an eminent authority remarks, "the genus antelope has become a kind of zoological refuge for the destitute, and forms an incongruous assemblage of all the hollow-horned ruminants together. So diversified are its forms, and so incongruous its materials, that it presents not a single character which will either apply to all its species, or suffice to differentiate it from conter-minous genera." The antelope would appear to be minous genera." The antelope would appear to be the connecting link between the deer and the goat. the connecting link between the deer and the goat. In the peculiarity of never shedding their horns they resemble the goat; on the other hand, their fleetness, the colour and texture of their hair, their general structure, in fact, would place them near the deer tribe. The general colour of the antelope is brown on the back, and white under the belly, variegated with black stripes. With regard to the size of the antelope, while one of the largest suscing are some flyeor as while one of the largest species are some five or six feet in height, there is a singular little variety,pigmy antelope, which scarcely measures nine inches. The whole tribe amount to about eighty species. Antelope flesh forms a considerable portion of the native's larder, as well as affording food to some thou sands of the carnivora. In cases of severe drought, they have been known to sweep down on the cultivated fields of the colonists in such flocks as to cause fearful devastations.—Ref. English Cyclopædia-Nat. Hist.

ANTELUCAN, an-to-low-kan (Lat. aste, before, and lux, light), before light, a term applied by ecclesiastical writers to things done in the night, especially used in reference to the assemblies of Christians which were held during the night in the early times of persecution.

ANTEMBRIDIAN, un-te-he-rid'-i-na (Lat. ante, before, and meridies, noon or mid-day), before noon or twelve o'clock in the day, used in its abbreviated form A.M. to denote any time between midnight and noon.

ANTENNE, an-ten'-ne (Lat., a yard-arm), in Ent., those slender bodies with which the heads of insects are furnished, being synnonymous with what are called feelers or horns. (See Bre. Insect, &c., for the several varieties of antenne.)—Ref. Kirby and Spence's Introduction to Entomotory.

ANTIFERULT, an'-le-pe-nult' (Lat. ante, before, pene, almost, and ultimus, the last), is used in Gram. to denote the last syllable of a word except twe,—the one before the penult.

Antenion, in tervi-or, before either in time or place. In Anat. it is often used to designate parts which are situated before others, and is thus opposed to posterior; as, the anterior lobes of the brain, the anterior intercostal nerve.

stilercostat nerge.

Antibulity, in-the'-lix (Gr. antihelix, from anti, opposite to, and helix, a spiral), in Anat., is an eminence on the cartilage of the ear, situated before, or more properly within, the helix, or outer circle of the ear. It consists of two ridges as its upper part, which unite as they descend.

as they descend.

ANDELMINICS, ân-thel-min'-tike (fir. anti, against, and elmius, a worm), a term applied to such modicines as have the effect of destroying worms in the stomach and intestines. They are of various kinds, but may be divided into three classes,—those which, by increasing the peristaltic motion of the intestines, tend to displace the worms, and may thus occasion their expulsion,—as purgatives of various kinds; those which tend to strengthen the stomach and intestines, and the system generally,—as tonics or analeptics; and those which set specially upon the worms, dislodging, weakening, or killing them. These last are anthelminities, properly so called. Of this class, the oil of turpentine is generally the best medicine that can be employed, and is,

# Anthem

perhaps, the only one that unequivocally acts as a direct poison on the worms.

ATTHEM, an them (Gr. anti, against, and humnes, a hymn), properly eignifies hymn sung in alternate parts, as being anciently sung alternately by the two sides of the choir. At present the name is applied to a species of musical composition, introduced into the service of the English church in the beginning of the reign of Queen Elizabeth, the words being taken from the Psalms or other suitable portion of the Scriptures or Liturgy. There are three kinds of anthem,—solo, verse, and full authem. The solo anthem has only one voice to a part; the verse consists chiefly of chorus, but there are also verse parts for single voices; the full anthem is

wholly chorus, and sung by all the voices; the full anthem is wholly chorus, and sung by all the voices. The anthem can only be heard to perfection in cathedral service.

ANTHEMIS, in the mis (Gr., the Chamomile plant), in Bot., a gen. of plants belonging to the nat. ord. Composite, sub-ord. Tublishora, and distinguished by having the scales surrounding the flower-heads members with the headers like these of a heaver-themselve the headers. branous at the borders, like those of a chrysanthemum, from which genus it, in fact, differs chiefly in the re-ceptacle of the flower being furnished with little chaffy projections. The most important plant of the genus is A. nobilis, the common chamomile, which is extensively cultivated for the sake of its flowers. It is an indi-genous perennial, flowering from June to September, and growing on open gravelly pastures and commons. The capitula, which are commonly termed flowers, are each composed of a number of tubular yellow florets, arranged on a receptacle, and surrounded by a circle of ligulate white florets. The double variety is produced at the expense of the tubular florets, which The single become converted into ligulate florets. flowers are to be preferred for medical purposes, as the central yellow florets contain much more volatile oil than the white ones. Chamomile is cultivated for the London market at Mitcham and in some parts of Derbyshire. Both leaves and flowers possess a strong but not unpleasant aromatic odour, and a nauseous but not unpressant arounder court, and a maneous bitter taste. The principal constituents of the flowers are volatile oil, tannin, and bitter resinous matter. The oil, which is procured by distillation, is stimulant and antispasmodic, and is frequently used in the preparation of tonic and cathartic pills, and to relieve lattlence, griping, and errotation. The dried flowers have the same properties as the oil, and are used for the same purposes. They are also complexed extendity the same purposes. They are also employed externally for fomentations. The chamonile flowers of the German pharmacologists are the produce of a species of Matricaria, a genus very closely allied to the Anthemis. On the continent A. nobilis is called the Roman chamomile, to distinguish it from M. Chamomilla, which is there generally known as the common chamomile. Two other species of Authomis may be noticed,—A. Cotala, the May-weed, a common wild plant, sometimes mis-

taken for the chamomile; and A. tinetoria, which yields a yellow dye, much used in France by the dyers.

ANTIER, öx'-ther (Gr. antheros, belonging to a flower), in Bot, an essential portion of the stamen, being the bag or case (e) which contains the pollen. It is generally supported on the summit of a little column or stalk called the filament (d). The pollen is discharged at certain periods through little slits or holes formed in the anther. (See STAMEN.)

Antheridia, an-the-rid'-i-a (Gr. anthos, a flower), in Bot., the general name applied to all the various struc-

tures in which, certainly or probably, the fertilizing function of reproduction resides in flowerless plants, and which consequently correspond physiologically to the anthers of flowering plants. All these organs have one character in common,—namely, that of producing ex-tremely minute bodies endowed with spontaneous motion when placed in water. These moving bodies from the antheridia are called spermatozoids, antherozoids, or spermatic filaments. (See SPERMATOZOIL).

ANTHESIS, ān-the'-sis (Gr., flowering), in Bot. this term is sometimes used to indicate the period at which

the flower-bud opens.

ANTHERS.

## Anthracite

ANTHOCARPOUS, an-tho-kar'-pus (Gr. anthos, flower, karpos, fruit), in Bot., a general term for fruite formed by the combination of several flowers. Such ANTHOCARPOUS, ŭn - tho - kar' - pus fruits usually consist not only of the carpels of the flowers, but of their bracts and floral envelopes as well, a fact indicated by the derivation of the term anthocarpous. The terms multiple, aggregate, and collective, have also been applied to these fruits. The most important anthocarpous fruits are, the cone, which is seen in the fir, larch, spruce, and other plants of the order Conjferc; the galbulus, seen in the typress and juniper; the strobilus, seen in the hop; the strobilus in the pineapple; and the sycoms, in the fig. These fruits are described under their respective heads.

ANTIOCEROTE, in-tho-se-ro-te (Gr. suthos, a flower; kirkis, a ray), in Bot, a sub-ord, of the national depotience, the Liverworts, distinguished by having valved pod-shaped sporangin.

ANTHODIUM, an-tho'-di-um. (See CAPITULUM.) Anthology, an-thot-o-je (Gr. authos, a flower, and logia, a collection), in Lit., is a collection of choice but generally in the latter. It is more particularly applied to certain collections of Greek epigrammatic applied to certain collections of Greek epigrammatio poems. Meleager, the Syrian, who lived probably about the middle of the 1st century before Christ, is generally regarded as the first that produced a work of this kind. Subsequently, similar collections were made by Philip of Thessalonica, Diogenianus of Heraclea, Strato of Sardis, and Agathias; but all these ancient works are lost. Many of the pieces, however, are preserved in the later works of Constanting Caphales who lived in the 18th century and Maria. Cephalas, who lived in the 10th century, and Maximus Planudes, who flourished in the 14th. Of the latter, the first printed edition is that of Lascaris, at Florence, 1484. The last edition, with a Latin metrical Florence, 1444. The last edition, with a Latin metrical translation by Grotius, is that commenced by Bosch, and finished by Lennep, in 5 vols., Utrecht, 1795— 1822. In 1696 a manuscript copy of the carlier col-lection of Cephalas was discovered by Salmasius in the Heidelberg library. It was taken to Rome during the Thirty Years war, and subsequently to Paris; but was restored to Heidelberg in 1810. It is much the richer and better of the two, and has been frequently edited. In imitation of the Greek authologies, several Latin anthologies have been made by Scaliger, Pitthöus, Burmann, and others. Oriental literature, particularly the Arabian, is very rich in anthologies.

ANTHOTAXIS, an-tho-tax-is. (See Inflorescence.)
Anthoxanthum, an-thox-an'-thum (Gr. anthos, a ANTIONANTIUM, an-inon-an-inem (vr. anios, a flower, and a aniho., yellow), in Bot., a gen. of grasses. The species A. odoratum is commonly known as the sweet verna; gass, and greatly esteemed for its sweet smell, which causes much of the well-known fragrance

of new-nown hay.

ANTHOZOA, āii'-lho-zo'-ā (Gr. anthos, flower, zoon, animal), a class of that division of the animal kingdom termed zoophytes (animal-flowers). The anthozoa are divisible into three orders, -A. hydroida, A. asteroida, and A. helianthoida. These so-called animal-flowers apparently, but not in reality, combine the animal and vegetable in their nature; for they possess the sense of touch, the power of voluntary motion, and usually feed on matters which they have swallowed or sucked in, digesting them in an internal cavity; thus com-pletely exhibiting the attributes of an animal. (See ACTINIA and ZOOPHYTES.)

Anthracite, an'-thra-site (Gr. anthrax, coal) .- Anthracite, stone-coal, culm, or coal-glance, is a very hard, lustrous kind of coal, found in the lowest parts of the carboniferous strata. It contains 90 to 90 per cent. of earboniceous matter, and burns almost without flame, with a steady glow. Being the oldest of coals, it differs considerably from other kinds. It is nearly devoid of structure, and contains no impressions of plants. Its fracture is somewhat lamellar when broken in the direction of its bed, but irregularly conchoidal when broken across. Some specimens exhibit a beautiful play of colours, and are thence called peacock-coal. play of colours, and are thence called peacock-coal. Being difficult of combustion, from its extreme hardness, it can only be burnt in a strong current of sir. The coke obtained from it is very similar to the original coal both in bulk and weight. It is much used for steam-boilers, and for various metallurgical operations, where a strong current of air is easily procured, and an

### Anthracotherium

intense heat is required. Anthracite is very abundant in the Weish coal-field, where excellent qualities are found. It also occurs in enormous quantities in North America; but much of it is so compact that it cannot be used as fuel.

ANTERACOTHERIUM, an'-thra-ko-the'-ri-um (Gr. anthrax, coal therion, beast), a gen. of fossil pachyderma-tous animals, that seems to stand intermediate between the river-hog and the hippopotames. The remains of the anthracotheria were first found in the tertiary lignites, or wood-coals of Liguria; hence the name given

to this extinct animal.

to the exunot animal.

Amentatous, an-thris'-kus, in Bot., a gen. of plants
belonging to the nat. ord. Umbelliferæ, and characterized by possessing little or no calyx, with heartshaped petuls bent down at their points; and by producing a fruit narrowed below the short beak, and without any ridges. The species A. vulgaris, the common beaked parsley, grows wild in waste places, and is sometimes confounded with homlock, but may be easily distinguished by its paler colour, the slight hairiness of the leaves, and by the absence of spots on the stem, and the swelling under cach joint. The species A. cerefulium, the garden chervil, was formerly cultivated as a potherb. A. sylvestris, the wild chervil, is a common weed in hedges and banks throughout England.

mon weed in hedges and banks throughout England.
ANTHROPOLITE, in-throp'-o-life (Gr. anthropon, man, lilhos, stone), in Geol., a torm which has been applied to the petrilled human bones from Guadaloupe, and elsewhere. "These remains," says Mr. Fago, "can scarcely be considered fossil, or even sub-fossil; but must be regarded in the sams light as any recent petrifaction produced by the action of calcareous retains."

waters.

ANTIROPOLOGY, in-thro-pol'-o-je (Gr. unthropos, man, and logos, a discourse), is the name of that science which in its widest sense treats of human nature both physically and mentally. It thus includes anatomy, physiology, psychology, ethnology, and even history, theology, asthetics, &c. It is often, however, limited to the relations existing between the soul and body in man. This science has been little cultivated among us; but it is otherwise in Germany.—Ref. among us; but it is otherwise in Germany.—Reft. Kant's Anthropologic in pragmatischer Hissicht, 4 edf., by Herhart, 1833; Staffen's Anthropologic, 1822; Burdach's Anthropologic für das gebildete Publicum, 1837; Birnbaum's Lehrbuch der Anthropologic, 1842.

Antingoromorphism, ün'thropologic, 1842.

Antingoromorphe, form or shape), literally signifies the representation of human form, and in theology, is used to denote those conceptions of the nature and attributes of God. which we form and express by words

attributes of God, which we form and express by words derived from human or terrestrial qualities or objects. As finite beings, it is impossible for us to form true conceptions of what is infinite; we can only judge and speak of it from what we find within and around us ence we read in Scripture of the eye, ear, hand of God, as well as of his remembering, forgetting, &c. It was necessary that the divine revelations addressed to mankind should be clothed in language adapted to their inferior capacities; but it is orident that it is necessary to guard against being led into too gross and material notions by such language.

Anthropomorphith, an'-thro-po-mor'-fite, a sect of succent hereties, called also Andreans, which arose in the 4th century, and, taking everything spoken of God in Scripture in a literal sense, especially that passage in Genesis where it is said that "God made man after his own image," maintained that God had a human

Anthropopuagi, un-thro-pof-u-ji (Gr. anthropos, and phago, 1 eat), cannibals, or man-caters. (See Canni-

BALS.

hannythins, än-thiv-lis (Gr. anthos, flower, hulos, beard), in Bot, the kidney vetch, a gen. of plants belonging to the nat. ord. Leguminosa. The silky appearance of the heads of flowers suggested the botanical name. A. Vulnevaria is recommended as a herbage plant by some writers on agriculture.

ANTIREN, an'ti-a-rin, the poisonous principle of the upas-tree (Upas antiar). It is extracted from the gum resin of the tree. Introduced into a wound, it

brings on violent comiting and convulsions.

ANTIARS, int. ti. in. in. Bot., a gen. of plants belonging to the nat. ord. Artocarpacea. The species A.

# Anti Corn-Law League

toxicaria is the celebrated antajar, or upas poison-tree of Java, concerning which many fabulous and absurd stories have been told by travellers. (See Uras.) The borles have been toke by craveliers. Local Vess. All bark of A. excidence, a tree growing in India, is used for cordage and matting. Sacks are also manufactured from it by a very simple process. A branch is out corresponding to the length and diameter of the sack wanted. It is soaked a little, and then beaten with wanted. It is soaked a little, and then beaten with clubs till the liber separates from the wood. This done, the sack formed of the bark is gradually turned inside out and pulled down, as the wood is awn off in slices. A thin slice is left to form the bottom of the sack. These bark sacks are commonly used for carrying rice.

ANTI-ATTRITION, an-ti-at-trish'-un (Gr. anti, against; Lat. attritio, a rubbing, wearing away), black-lead mixed with four times its weight of tallow or fat. It is

used to prevent friction in machinery.

Antibuugers, ün-ti-bur-gers, were a sect of Scottish Presbyterian dissenters, who differed from the established church chiefly in matters of church government. They differed from the Burgers, with whom they were originally united, regarding the lawfulness of taking the burgess oath. They have since become united with various other sects of dissenters into what is known as the United Presbyterian Church.

ANTICHLORE, or ARTICHLORINE, "in-ti-klo'-rine.— Sulphate of soda has lately become a commercial product under the above name, and is much used to clear bleached fabrics from any excess of chlorine that may remain in them. The chlorine in the presence of water seizes on an atom of hydrogen, leaving the remaining atom of oxygen free to join the sulphurous acid of the salt to form sulphute of soda. It is occasionally used us a deoxidizing agent in analysis. Hyposulphite of soda is also extensively employed as an antichlore, and

acts in a similar manner as the sulphate.

ANTICHEIST, and ti-kriste (Gr. anti, against, and Christos, Christ), literally signifies the opponent or adversary of Christ, and is the name given to the great enemy of true religion, who is to appear before the second coming of Christ. The name only occurs in the First and Second Epistles of St. John, where it is said that every spirit that confesseth not that Jesus Christ is come in the flesh, is that spirit of antichrist, whereof ye have heard that it should come, and even now already is it in the world. Antichrist is generally regarded, however, as "that man of sin" spoken of by St. Paul as "the son of perdition who opposeth and exalteth himself above all that is called God, or that is worshipped; so that he as God sitteth in the temple of God, showing himself that he is God" (2 Thess. ii.); and the beast spoken of by St. John in the Apocalypse as a beast rising out of the sea and making war upon the saints, with seven heads and ten horns, and ten crowns upon his horns, and upon his heads the name of blasphemy. False teachers are sometimes called antichrists. Protestants generally hold that the Roman Catholic church is antichrist.

ANTICIMAX, an-ti-kli'-max (Gr. anti, and klimax, gradation), in Rhet., denotes a sentence or discourse which descends from grant to little to

graduon), in thet, denotes a senence or discourse which descends from great to little, being opposed to climax, which ascends from little to great.

ANTICLINAL, än-ti-kiv-nil (Gr. anti, opposite, kim, I bend), in Geol., this term is applied to strata which dip in opposite directions from a common ridge.

This ridge is turned an anticline, or saddlebach 1.5. This ridge is termed an anticline, or saddleback.

SYNCLINAL.)

ANTI COEN-LAW LEAGUR was a league formed of the various existing anti corn-law associations, at a meeting held at Manchester in 1839, with a view to bring about a repeal of the corn-laws. A central office was established at Manchester, lecturers were employed, and publications issued, advocating their view; and great public meetings were held at various times in Manpublic meetings were neight various times in Mani-chester, London, and other places. Large sums of money were also raised for the purpose of bringing about free trade in corn; and, at a great meeting in Manchester in December, 1845, it was proposed to raise a quarter of a million sterling. The passing of the bill for the great of the dark of corn, however, and defended for the repeal of the duty on corn, however, rendered this unnecessary, and the league was formally dissolved on July 2, 1846. The efforts of Mr. Cobden in this cause were rewarded by a national subscription amounting to neurly £80,000.

#### Antidote

ANTIDOTE, in'-ti-dote (Gr. anti, against, and dotes, given), in Med., is a term applied to remedies or preservatives against sickness; but more strictly to substances which counteract the effects of poison.

ANTI-FRIOTION WHERLS, in-ti-frik'-shun, small wheels used in machinery to prevent the grinding or rabbing of surfaces moving in contact with each other. They are placed between the surfaces, and are sometimes fixed in axles, but more frequently left to run free. The wheels of castors and carriages are to all intents friction-rollers in principle. (See WHELLS).

ANTIMONIOUS ACID. (See ANTIMONY.)

ANTIMONY, in'-ti-mo-ne, in Chem., symbol Sb, from

ANYIMONYO, ACID. (See ANYIMONY.)

ANYIMONY, ar'-ti-mo-nc, in Chem., symbol Sb, from the Latin stibium; atomic weight 129, specific gravity 6.7. Antimony is a brilliant bluish-white metal. It uses at 850° F. It is so brittle, that it may be reduced to powder by being pounded in a mortar. It occurs in commerce in crystalline cakes, and is generally very impure. It volatilizes at a red heat. It is a bad conductor of electricity and heat. When heated in air, it burns, and gives off copious white fumes, consisting of teroxide of antimony. It is also oxidized by nitric and sulphuric acid, and dissolved by aqua regia. In its chemical relations, it is allied to nitrogen, phosphorus, and arsenic, and forms, with the last, one regia. In its chemical relations, it is allied to nitrogen, phosphorus, and arsenic, and forms, with the last, one of the connecting links beween the metallic and non-metallic elements. It forms three oxides, viz.,—1. Teroxide of antimony, SbO<sub>2</sub> a greyish-white powder, which is procured by boiling the metal with sulphuric acid, and evaporating to dryness, which gives the anhydrous form, or by adding carlionate of soda to a solution of the terchloride. 2. Antimonic acid, SbO<sub>2</sub>, and wellow powder taxtless and insoluble made. a pale yellow powder, tasteless and insoluble, made by adding nitric seid to the tersulphide, and driving off the excess of nitric acid by heat. Antimonic acid forms definite compounds with the alkalies and some of the metallic oxides. The pigment known as Naples yellow is an antimoniate of lead. 3. Antimonious acid. If antimonic acid be heated strongly, a compound is produced containing antimonic acid combined with produced containing antimonic acid combined with teroxide of antimony. This is erroneously called an acid, but it is really either a tetroxide of antimony or an antimoniate of antimony, i.e., either SiO<sub>4</sub> or SiO<sup>4</sup>; SbO<sub>5</sub>. Terchloride of antimony, or butter of antimony, SbCl<sub>5</sub>, is formed by heating the tersulphide with hydrochloric acid. It is very deliquescent, and forms a buttery mass, whence its commercial name. It is used as a caustic by veterinary surgeons, and for browning gun-barrels. It also forms a pentachloride, SbCl<sub>5</sub>. Tersulphide of antimony occurs native in grey lead-coloured masses, and is the only ore from which antimony is procured. It is much used for adulterating coloured masses, and is the only ofer from when antimony is procured. It is much used for adulterating common plumbago for lead-pencils. It may be easily detected by heating the lead, when the sulphur soon renders its presence apparent, or by the mark on paper being ineffaceable by India-rubber. It is used in pyrotechny for making Bengal lights. The hydrated tersulphide, mixed with the teroxide, is an amorphous red powder, and is used in medicine under the name of Kerme's mineral. Antimonuretted hydrogen, 8bH<sub>3</sub>, is formed when zine and antimony are heated with sulphusic acid. It is supposed to be an ammonia, correpartial acid. This supposed to be an administration sponding to PH<sub>8</sub>, phosphamine. Turtrate of antimony and potussa, or tartar emetic, is a valuable medicinal remedy. It is used in small doses as a sudorific and expectorant; in large doses, as an emetic. It is also used in eruptive fevers, and is a frequent and valuable remedy in catarrhal affections, as it induces the secretion of fluids on the surfaces of all mucous membranes. The Glass, Crocus, and Liver of Antimony are impure oxysulphides, and are formed by reasting the native tersulphide with access of air. The native tersulphide

tersulphide with access of air. The native tersulphide is called in commerce antimony, the metal being called in commerce antimony, the metal being called regulate of antimony. The compounds of antimony are easily recognized in solutions, by giving a characteristic orange precipitate with sulphuretted hydrogen.

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ANTIPATHY, in Ethics, is applied to that aversion or expurity.

# Antiphrasis

The sulphide is again reasted, and mixed with carbonate of soda and charcoal. On heating this mixture in a crucible, a quantity of the metal is formed at the bottom. The unreduced oxyaulphide which remains on the top is afterwards used for preparing Kermes' mineral. Antimony is never employed alone in the arts; but it forms several very useful alloys. It is chiefly used to harden other metals or alloys, and to communicate to them the power of swelling as they cot, a property extremely valuable in casting type, &c. Type metal is composed of four parts of lead and one of antimony. Music type contains in addition a small portion of tin. Britannia metal is a mixture of brass, antimony, bismuth, tin, and lead, in different proportions. Antibismuth, tin, and lead, in different proportions. Anti-mony was known to the ancients in the form of the tersulphide, and was used by them as a pigment to blacken the eyelids. It was first reduced to the metallic state by Basil Valentine, towards the end of the 15th century.

Antinomians, andi-not-mi-ans (Gr. anti, and nomos, law), in Theol., a name given to such as hold that Christians, being justified by faith, are freed from the observance of moral laws and the performance of good works. This error probably arose from a misunder-standing of the distinction made by the apostle Paul in the Epistle to the Romans, between faith and the works of the law. Various seets arose in the early church who might be termed Antinomians; but the name was first used by Luther at the time of the Reformation, and applied by him to the opinions advocated by John Agricola. The latter afterwards recanted, and, from that time, little has been heard of Antinomianism on the continent. During the time of the Commonwealth in England, certain advocates of this doctrine appeared, and, since that time, the term has been applied by way of reproach to various secta, with little regard to its original or proper meaning. Indeed, an extreme of Calvinism tends to a species of Antinomianism, in so far as religion is considered chiefly as a matter of faith, with little regard to practice,

manifestly overlooking the apostle's doctrine, that "faith without works is dead, being alone." ANTIFEDOBATISTS, ön-li-pe'-do-bip'-tists (Gr. anti, paidos, of a child, and baptizo, I baptize), in Theol., is a term applied to those who object to infant baptism. They are generally known in this country as Baptists.

They are generally known in this country as naphies. (See Bapties).

Antipathy, in-tip-si-the (Greanti, and pathos, feeling), in its widest sense, denotes the natural dislike or aversion which an animate being entertains for some particular object; as the antipathy of sheep to wolves, of a turkey-cock to the colour red. In the human species we frequently meet with remarkable cases of autipathy hy certain individuals to objects which are grateful or indifferent to the generality of mankind. Thus, some have an antipathy to certain kinds of food, as butter or eggs: to certain animals, as toads, mice, spiders; to certain tastes, smells, sounds, &c. In some cases the autipathy is so strong as to produce sickness or fainting. Doubtless, many of these feelings may be traced to early training, as when children are frightened with certain objects, or nauseated with certain kinds of food. But antipathy is not always a conscious caprice which may be removed by an effort of the will, or by habit, for it is sometimes found that the effects of the presence of these objects are manifested on the individual, though their resence was unknown, and that substances for which he feels an antipathy, when partaken of unconsciously, may produce in him exactly the same symptoms as if he had partaken of them the same symptoms as in he man parament of mean knowingly. It is difficult to account for this, except on the principle that there lie beyond the sphero of our consciousness, feelings and impressions which

# Antipodes

ing what we ought rather to affirm it to be; as, 'It did

ang what we ought rather to affirm it to be; as, 'It did not displose me,' meaning, 'I was pleased with it.' Anticones, in-tip-o-dees (Gr. ant, and pous, a foot), is a term applied to those who live on opposite sides of the earth, and, consequently, have their feet turned towards each other. They are in similar but opposite latitudes, and their longitudes differ by 180°; and, consequently, while they have similar climates so far as dependent upon latitude, their seasons, as well as their days and nights, are reversed.

their days and nights, are reversed.

ANTIPOPE, an'-ti-pope, one who assumes the title and functions of a pope without valid election. Antipopes elected by a sovereign, or by a faction, have frequently arisen in the Roman Catholic church, and have led to arisen in the toman Catalone cauren, and nave led to long protracted struggles. The emperors of Germany were the first to set up popes of their own ilomination, in opposition to those that the Romans had elected without consulting them. In many cases, both com-petitors—sometimes there were even three or four—for the papal chair, were equally untipopes, that is, their the papal chair, were equally antipopes, that is, their claims were equally good. Each was frequently supported by whole nations, and the schism was nothing else than the struggle of adverse political interests. During the 12th, 13th, and 14th centuries, there were numerous antipopes; but the most remarkable of these schisms in the Church, is that which took place on the death of Gregory XI., in 1378, and divided and agitated the Church for fifty years. The Italian party elected Urban VII. to the papel their and the French elected Urban VI, to the papal chair, and the French elected Urban VI. to the papal chair, and the French cardinals retired from Rome and elected one of their own number as pope, under the title of Clement VII. The claims of the latter were recognized by France, Spain, Savoy, and Scotland, while Haly, Germany, England, and the countries in the north of Europe, supported Urban. Clement established himself at Avignon, and there he and his successor, Benedict XIII., held their court, while Urban and his successor continued at Rome. The schism caused great scandal in the Church; the two popes excommunicated each other, and did not hesitate to compromise their sacred character by the most cruel outgrees and the grossest character by the most cruel outrages and the grossest insults. At length, a general council was held at Pisa in 1409, when both Gregory XII. and Benedict III., the successor of Urban, were deposed, and Alexander V. elected in their stead. Peace, however, was not established till the council of Constance in 1415, when all the three popes were deposed, and Martin V. elected in their room.

ANTIQUARIES, SOCIETY OF .- The Society of Antiquaries was first established in 1572, when Archbishop quaries was first established in 1512, when Archibsolop Parker, Sir Robert Cotton, and some others, united their efforts for the preservation of the ancient moun-ments of their country. James I. regarding the meet-ings of the society with apprehension, athought fit to dissolve it in 1694, and the society remained in abey-ance till the beginning of the 18th century. In 1707 its operations were resumed, and in 1751 it obtained a charter of incorporation from George II. The total number of members is about 650. Each member pays an entrance-fee of £5, 5s., and an annual subscription of £2. 2s.; or £26, 5s., in addition to the entrance-fee,

to become a life member.

ANTIQUARY, an'ti-qua-re (Lat. antiquarius, from antiquas, ancient), is one who studies and searches after monuments and remains of antiquity, as old medals, books, statues, sculptures, and inscriptions, and, in general, sil curious pieces that may afford any insight into antiquity. In a wider sense, it is one who makes the manners and customs of earlier times a special subject of inquiry, or who deduces history from the relics of the past. Antiquarii was also a name given in the Middle Ages to copies of old books, especially in convents. The keeper of an antiquarium, or cabinet of antiquities, was also styled an antiquities of a place are termed antiquaries, as are also, in Germany, those booksellers who deal in old or after monuments and remains of antiquity, as old also, in Germany, those booksellers who deal in old or second-hand books.

ANTIQUITIES. (See ARCHÆOLOGY.)

ANTI-RATIONALISTS, rāsh'-on-ā-lists, in Theol., a term sometimes applied by way of reproach to such as unduly depreciate the application of reason in matters throat dependent of the state o

# Anti-Trinitarians

they are impossible, and receive that as a chief arguthey are impossible, and receive that as a chief argument of their divine origin; there are others which are smenable to reason, and to be judged of accordingly. The difficulty is to know when reason and when faith is to be the guide, so that the one may not trench upon or usurp the province of the other. Those that unduly magnify reason, making it this chief or only guide, are termed Rationalists; those that unduly depreciate it, Anti-Rationalists.

ANYLERITYLE ANYLERITYLE (For continuous continuous contents of the co

Antierinum, in-tir-ri-num (Gr. cati, similar, rin, nose), a gen. of plants, so named because the flowers of most of the species resemble the snouts of some unimals. A. majus (commonly known as the snapdragon), and its varieties, are popular border flowers, which can be cultivated without trouble in any dry soil. The genus belongs to the nat. ord. Scrophulariacea, the

Figworts.

ANTI-SABBATARIANS, in-ti-nib-bit-toip i-ins, in Theol., is a term applied to those that are opposed to the observance of the Christian subbath, on the ground that the sabbath was merely a Jewish ceremonial institution, and consequently abolished by the coming of Christian. of Christ

ANTISCORDUTICS, skor-but-tiks (from anti, against, and scorbutus, a barbarons Latin word for scurvy), in Med., is a term applied to remedies against scurvy.

(See SCURVY.)

(See Scurvy.)

Antiseptics, in-li sep'-like (Gr. anti, against, sepeia, to putrefy), are the means or substances by which the decay or putrefaction of dead vegetable or animal substances is prevented or checked. There are three conditions which favour putrefaction:—I. A certain degree of warmth; 2. air; 3. moisture; by the absence of one or more of which its progress is retarded or arrested. The preservative power of cold is observable in animal or vegetable substances inheaded in the icon in animal or vegetable substances imbedded in the ice; and the packing of fish in barrels with ice is a common means adopted for preserving them. The exclusion of air is another means of checking putrefaction. In this way, means are frequently preserved by being put into tin canisters, which, after the air is carefully extracted, are soldered down. Again, substances may be preserved by the abstraction of moisture; as in plants, dried fish, bacon, &c. The more important chemical autiseptics are alcohol, salt, nitre, alum, crossoto, arsenic, corrosive sublimate, sulphate of copper, and chloride of zige.

ANTISPASMODICS, in fispis-mod'iles (Gr. anti, and

spasmos, a spasm), in Med., are those remedies which are employed to allay or remove spasms or cramp.

(See Spasm.)

ANTISTASIS, an-tis'-til-sis (Gr. anti, and stasis, a position), in Rhet., is a term applied to what is in Latin called comparativum argumentum, and is that species of defence of an action which is founded on the asseror uccence or an action which is touded on the assertion that if it had not been done, worse would have ensued. In this way, a general may defend an inglorious capitulation, by asserting that, except for it, the whole army must have perished.

ANTISTROPHE, in-ti-strot-fe (Gr. anti, against, and strophe, a turning), was a term applied by the ancients

to that part of a song or dance before the altar, which was performed by turning from west to east, in oppowas performed by turning from west to east, in opposition to the strophe, which was performed by moving, from east to west. Hence strophe and antistrophe came to be applied to certain stanzas of an ode, togsther with epode, which was applied to that part which was sung when the chorus stood still. In Gram, antistrophe is applied to the changing of things mutually dependent upon each other; as, 'The master of the servant,' and 'The servant of the master.'

Any returns of the like-sis (Gr. opnosition), in Rhet.

ANTITHESIS, and the servant of the master. ANTITHESIS, an tilh'e-sis (Gr., opposition), in Rhet., is the bringing together or contrasting things that are is the bringing together or contrasting things that are opposed to each other; as in that passage from Giocro, "On the one side stands modesty, on the other impudence; on the one fidelity, on the other deceit; here piety, there sacrilege; here continency, there lust." In the same way, when it was said of a book that it contained much, both new and true, but that the new it contained was not true, and the true was not new. When judiciously introduced, this figure gives vigour and incliness to style; but its froquent introduction becomes tedious.

Anti-Teinitarians, da-fi-trin-i-tair-i-ns, in Theol., are those who deny the doctrine of the Trinity, and

hold that there are not three persons in the Godhead. There have been various kinds of Anti-Trinitarians; but, in the present day, the term is principally applied to the Socinians or Unitarians.

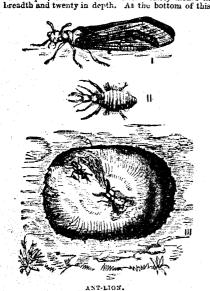
ANTITYPE, dis'-ti-tipe, is a Greek word, literally signifying a figure formed after or corresponding to some other type or figure. A type is a patiern according to which a thing is to be made; antitype is a thing formed according to a model or patiern. In a theological sense, the antitype is that in which a two is fulfilled: which a thing is to be made; enterty to a state of a theological according to a model or pattern. In a theological sense, the antitype is that in which a type is fulfilled; as the paschal lamb is the type of which Christ is the antitype. By the early fathers, the bread and wine in the Eacharist are styled the antitypes of the body and blood of the Land. blood of our Lerd.

the Eucharist are styled the antitypes of the body and blood of our Lerd.

ANTLER, datt-ler, in Zool., the term applied to the horn of the Cervida. Until the deer is a year old, nothing but a slight protuberance marks the places where the antiers sprout. In the second year the horn appears, and is called the brow auther; the next year it has a branch, and is known as the bay auther; the fourth year it has two branches, and is a tray auther; the fifth, another branch and a new name, crockets; and again, at the sixth year, when the antier is perfect, and is called a beam auther. The deer's antiers are shed in the spring; and, considering their size and weight, are renowed in an astonishingly short time. A full-grown stag's horn probably weighs twenty-four pounds; yet this large mass of true bone is reproduced in about ten weeks. The development of the deer's authers is intimately connected with the sexual system. (Sec Deer.)

ANT-LION, ant'-li-on (Gr. murmex, ant, and leon, ion) (Myrmeleon formicalco), an insect of the ord. Neuroptera, celebrated for its wonderful incensity in constructing a pitfall for the destruction of its prey. As soon as the young larves are hatched, they at once set about providing for their future sustenance. This is effected by turning round and round in the sand till a small cavity is made, which, as the

in the sand till a small cavity is made, which, as the animal increases in size and strength, grows broader and deeper, till it measures about thirty inches in



pit the ant-lion patiently remains, till some unsus-poeting insect, arriving at the edge of the trap, thinks there can be no harm in exploring it. The sides of the pit, however, are so arranged as to afford foothold not even to the timest insect, and down rolls the little victim into the trapper's clutches; or, should it mani-fest any intention of escaping, a shower of sand,

thrown up by the ant-lion, at once arrests its progress, and brings him tumbling to the bottom again. It is entirely on the juices of insects that this worscious creature lives. The empty carcases are not allowed to creature nees. The empty carcases are not answed to encumber his abode. As soon as he has exhausted their fluids she balances them in his atrong jaws, and tosses them out. The larva remains in this condition during two years; at the end of which time, having attained its full growth, it spins a cocoon, and takes the above the above the characteristic form. the chrysalis form. Three weeks afterwards, it emerges a perfect insect. The ant-lion is, when full-grown, a perfect insect. The ant-lion is, when full-grown, about half an inch in length, and somewhat resembles the dragon-fly, except that it is much smaller. It has a very large abdomen and a very small head, which, however, is furnished with a pair of formidable incurved mandibles: It has six legs, but is incepable of rapid locomotion, and generally moves backwayds. The perfect insect deposits its eggs in dry sandy situations, when the young larvas, immediately after being hatched, begin, as we have seen, to exercise an astonishing instinct in luring insects to their doom. The Muraleon formicales is not found in England. The Mymeleon formicaleo is not found in England, but occurs in many parts of the continent, as France, Germany, Spain, &c. In the accompanying illustration are shown—I. The perfect insect; II. The larva of the insect; III. The pit of the larva, and an ant being attacked. being attacked.

ANTONOMASIA, ñn-to-no-mai'-si-d (Gr.anti, and onoma, a name), is a term used in Rhet. to denote the substitution of an appellative for a proper name; as when Moses is called the Lawgiver, Aristotle the Stagyrite,

or Shakspere the Bard of Avon.

Antosiandrians, an-to-si-an'-dri-ans, in Eccl. Hist., were a sect of rigid Lutherans, and were so called from their being opposed to the doctrines taught by Osi-ander regarding justification. They held that man is not really made just, but only pronounced to be so; that he is not made essentially, but only putatively

AGRIST, oi'-o-rist (Gr. a, not, and oros, a limit), in Gr. Gram., is the name of an indefinite kind of tense of the verb, which usually expresses past time, but sometimes the present or future.

AOBTA. (See ANATOMY.)

APARTMENTS, a-part'-ments .- (For the law of letting

them, see LANDLORD AND TEMANT.)
APATHY, ip'-a-the (Gr. a, without, and pathos feeding), denotes a privation of iecling, a want of passion or emotion. The uncient Stoics affected an entire apathy, considering it as the highest wisdom to entire aparty, considering it as the highest wiscont to enjoy perfect calminess or tranquillity of mind, incapa-ble of being ruffled, and above the reach of any sense either of pleasure or pain; whilst Epicurus taught his followers to seek happiness in a kind of indolent ease, or freedom from bebour and pain. In the first ages of or treadom from about an pain. In the first ages of the Church, the term apathy was employed by the Christians to express a contempt for all earthly concerns,—a state of mortification such as the Gospel prescribes. Clemens Alexandrinus, in particular, brought it greatly into use, expecting thus to draw to Christianity the philosophers who aspired after such a sublime pitch of virtue.

APATITE, üp'-ü-tile (Gr. aputaa, I deceive).—Apatite has received its name from the fact that it is continually mistaken for beryl, fluor spar, and several other minerals, according to its colour and lustre, which vary considerably. It crystallizes in hexagonal prisms, modified sometimes on the edges, at others on the angles. It is a scarce mineral in England. Fine spe-cimens are found in Moravia, Bohemia, and Saxony. It is a triphosphate of lime, combined with a variable quantity of fluoride or chloride of calcium.

APAUME, or APPAUME, a-pome' (Fr. a, and paume, palm of the hand, in Her., means a hand, showing the palm extended, with the thumb and fingers at full length.

APE, aip (Pithacus of Linneus), a gen. of quadrumanous (four-banded) manmalis, a class of animals which, commonly speaking, are divided into four sections:—Apes, or such as are destitute of a tail: baboons, or such as have muscular bodies, elongated muzzles, and whose tails are unable chart. muzzles, and whose tails are usually short; monkeys, whose tails are in general long; and sopajous, or monkeys with prehensile tails, which can at pleasure be twisted round any object. (See MONKEY.) According, how-

### A.peak

ever, to the scientific coological definition, the gen. Ape, or Pithacus, comprehends only those four-handed mammals whose teeth are similar, both in number and form, to man's, and which have neither tails nor cheek-pouches. The worship of apes and monkeys has



been common among pagan nations from a period of remote antiquity, and still prevails in Japan and India, and certain parts of Africa. An ape's tooth, kept in a temple at Ceylou, was regarded with peculiar revernce, and immense wealth was accumulated through erence, and immense weath was accumulated through the continual offerings of the worshippers; but the temple was plundered and the tooth carried away by the Portuguese, in 1554. (For a notice of the most remarkable apes, see GORILA, OURANG-OUTANG, CHIMPANZEE, &c.; for an account of species, &c., see SIMIADÆ, QUADRUMANA.)

APEAR, a-peck', in Mar., a term implying that the ship's cable is drawn so tight as to bring the vessel immediately over her anchor, which is then said to be

APERISPEUMIC, a-pe-ri-sper'-mik, in Bot., a term synonymous with exalbuminous, which see.

APRTALOUS, a-pel'-a-lus (Gr. a, without, and petalon, loaf), in Bot, a term applied to a flower having but one whori of floral envelopes; in other words, having a calyx, but no corolla. Jussieu named one of his proposed divisions of the vegetable kingdom apetala, and included in it all dicotyledonous plants bearing apetalous flowers.

APEX, ai'-pex (Lat.), the vertex or summit of any thing. Among the Romans it was also the name of a kind thing. Among the Romans it was also the name of a kind of conical cap, worn by the priests, or, more properly, of a small stick, with a tuft of white wool attached, which was fastened to the top of it. The crest of a helmet was also called apex. In Gram, it is applied to a mark placed over a syllable to denote that it is to be pronounced long; especially used when a word has a different meaning, according as it is pronounced long or short; as, in Latin, malus signifies ill; mālus, an appliatice.

APHERESIS, a feer-e-sis (Gr. aphairee, I take sway), is a term used in Gram. to denote the taking away of a letter or syllable at the beginning of a word; as, it's, for it is; 'quinst, for against. A like retrenchment at the end of a word is called apocope.

# Apocalypse

to increase after leaving that position, until it attains its maximum speed at the perihelion, (See Pani-(See PERI-BELION, PLANET.)

APHIDE, if it id (Gr. aphis, a vine-fretter).—These creatures, commonly known as plant-lice, live by sucking the juices of plants, upon which they may be seen congregated in immense numbers. When attacked congregated in immense numbers. When attacked, the plant grows sickly, the leaves curl up, and the fruit of the plant, if not ulterly destroyed, is certain to be seriously impaired. The cultivation of hope is notoriously an uncertain business, and this uncertainty may in great measure be attributed to the prevalence of the hop-fly (Aphis Humuli). So great are their devastations in some seasons, that the amount of duty paid upon hops has varied from £15,000 to £450,000; upon hops has varied from \$215,000 to \$460,000; indicating, of course, a proportional variation in the crop. There is an aphis that particularly affects turnips and cabbages, and one (Aphis vastator) that has earned for itself a world-wide fame,—though it is doubtful if it ever deserved it,—as a blighter of potatoes. Most of the aphidæ are green; but that which attacks the bean (Aphis Fabæ) is black. They have a proboscis, by which they pierce and suck plants, and, at the extremity of the abdomen, two horn-like spines, from which exudes a saccharine fluid called boney-dew. The legs of aphides are long, and they move very slowly. Some are winged, and some are winged, and some are winged, and some are found furnished with perfect-generative organs, are found furnished with perfect-generative organs, found furnished with perfect-generative organs, are tound turnished with perfect generative organs, and the femules lay eggs, which are hatched in the following spring. But, instead of producing insects of both sexes, these eggs give birth only to femules, which, in their turn, produce living young without any congress with the male. The brood thus brought forth again produces young in the same manner; and this goes on throughout the whole summer, without the appearance of a single male insect."—Ref. Dallas's Animal Kinadam. Kingdom.

Aphonia, a first is a deprivation or loss of voice. It is generally occasioned by an affection of the mucles or nerves employed in speech; and its cure is to be effected by removing the disorder from which it proceeds.

Арновіям, af'-a-rism (Gr. aphorizo, I separate), is a maxim, or a short sentence, containing a moral precept or rule of practice, forcibly expressed in few words; as, 'It is always safe to learn from our enemies; seldom safe to instruct even our friends.' It is also applied in Med. and Law to certain truths laid down, but not treated argumentatively; as the aphorisms of but not treated argumentatively; as the appointing of the civil law, &c. It is likewise upplied to a figure in rhetoric, whereby something that has been said is limited or corrected.

APHRITE, āff-rite (Gr. aphros, foam), carbonate of lime occurring in scaly masses, having a peachy lustre and greasy feel; also called foam-spar. This mineral limited to the confidence of the confidence of

must not be confounded with meerschaum (sen-scum),

which is an amorphous carbonate of magnesia.

APHRODITA. (See SEA-MOUSE.)

APIACEE, ai-pi-ai'-se-e, in Bot., a name sometimes given to the nat. ord. Umbelliferæ, which see.

given to the nat. ord. Umbellifera, which see.

Apiari. (See Bres.)

Apiochinite, al-pi-ok'-ri-nite (Gr. apion, a pear), in Geol., this term is applied to a kind of encrimite peculiar to the chalk and colitic formations, and distinguished by a pear-shaped receptacle. (See Encrinte.)

Apis, ai'-pi-um, in Bot., a gen. of plants belonging to the nat. ord. Umbellifera. The common celery, a convectors is the only important species. This

of the nat. ord. Omeetiform. The common ceres, a graveolous, is the only important species. This plant grows wild in almost every part of Europe; but is quite unfit for food until cultivated with absence of light, when the stem and petioles become succulent,

for it is 'guinst, for against. A like retrenchment at the end of a word is called apocope.

APHAINTE, ü-faint! (Gr. a, priv., and phainein, to appear), a tough compact rock, containing hornblende, quarts, and felspar, mixed so intimately as to be impereptible;—whence the name.

APHAINTE, ü-faint! (Gr. apo, from, and helios, the APHAINTE, ü-faint! (Gr. apo, from, and helios, the correction, d-ja'-li-on (Gr. apo, from, and helios, the sun), in Astron., that point in a planet's orbit at which its stits greatest distance from the sun. The rapidity of a planet's motion is least at its aphelion, and begins written earlier, during the reign of Nero. The author-

ahip of this book is commonly ascribed to John the son of Zebedee, and brother of James; but some, cer-tainly not without reason, ascribe it to another John, tainly not without reason, ascribe it to another John, commonly called the Fresbyter. It has sometimes been attributed to the arch-heretic Cerinthus; and hence it has not always been held as canonical. There were certain churches in Greece, as St. Jerome informs us, that did not receive it; and it does not occur in the catalogue of canonical books prepared by the council Laodicea, nor in that of St. Cyril of Jerusalem; but Justin, Irenœus, Origen, Cyprian, Clemens of Alexandria, Augustine, Jerome, Tertullian, and all the fathers of the 4th, 5th, and following centuries, quote the Revelation as a book then acknowledged to be canonical. The controversy regarding it was revived canonical: The controversy regarding it was revived at the time of the Reformation, and Luther expresses himself very vehemently against it. The reformation Geneva, however, Calvin and Bezz, received it as canonical; and these have been followed by Protestants. generally. This book embraces two distinct ranges of -1. The things which then were, or the state subjects :subjects:—1. The things which then were, or the shade of Christianity as then existing in the seven Asiatic churches; and, 2. "the things which should be hereafter," or the constitution and fate of the Church through its several periods of propagation, corruption, reformation, and triumph, from its commencement to its final consummation in glory. The general design of the prophetic part of it is to show the final triumph of Christianity over all enemics and opposers, its universal prevalence in the world for a long series of years, and its termination in an endless period of glory and happiness. "Christianity is, in a manner, personified, and it appears on the scene of action engaged in a contest with the powers of darkness so violent that the struggle must evidently end in the extermination or utter subjugation of one of the parties. Successively, one and another bitter and bloody enemy of the Church one and another bitter and bloody enemy of the Church is overcome; then follows a long period of peace and prospority, during which the influence of Christianity is so widely diffused, that no apparent hostility disturbs it. After this, the powers of darkness renew their assault with exasperated malice and rage; but the interposing hand of Heaven smites them down, and puts a final end to the contest. The peaceful and universal reign of the Christian religion then succeeds, and con-tinues down to the final consummation of the Messianic kingdom on earth, when the resurrection and judgment day introduce a new and perfect order of things, which is to continue through ages that have no end."—Ref. Moses Stuart's Commentary on the Apocatypes. There have been several spurious apocatypes; as those of Moses, Peter, Paul, Stephen, Thomas, &c.; but most of these are now lost.

of these are now lost.

Arocarpous Fruirs, "up'-o-kar'-pus (Gr. apo, separate, karpos, fruit), in Bot., are those fruits which are each formed of a single carpel, but of which several are produced by a single flower. The simple solitary fruits are generally included under the same head; but the most philosophical botanists have kept them distinct. Three kinds of apocarpous fruits are distinguished, and these are respectively termed the Folliche, the Acho-nium, and the Elexio. (See these words.) APOCOREN. (See APRERESIS.) APOCRENIO ACID, äp!-o-kre-nik, an acid found in vege-

table mould, which retains ammonia with great tena-city, thus affording nourishment to the plants in its vicinity. Crenic, geic, ulmic, and humic acids, are found in similar situations, and possess similar pro-

APOCRYPHA, d-pok-re-fd (Gr. apokrupha, hidden, secret), a term used in Theol. in various senses, to denote certain books claiming a sacred character. Among early Christian writers it was frequently applied Among early Christian writers it was frequently applied to anonymous or pseudonymous works. It was also applied to dangerous works, composed by ancient heretics to favour their views, or by Catholics under fletitious signatures. At present, the name is commonly applied to certain books which are not canonical, but which have sometimes been regarded as such, and are generally held as useful for instruction and edification. These books were not received by the Jows as any portion of the Old Testament, and they are not cited or alluded to in any part of the New. either were they regarded as canonical by the early fathers, though they were generally considered worthy

of reverence and esteem, till the council of Trent, in 1545, adjudged that they were to be held as canonical by the Catholic church. At the Reformation, Protestants generally rejected them; but they soon began again to be read in public worship. The Church of England enumerates the spooryphal books in her XXXIX. Articles, as books which "the Church doth read for example of life and instruction of manners, but yet doth it not apply them to establish any doctrine." By the other Protestant churches in England and America. the other Protestant churches in England and America, they are rejected from public worship. The spoery-they are rejected from public worship. The spoery-phal books are, I. and II. Esdras, Tobit, Judith, Esther, Wisdom of Solomon, Ecclesiasticus, Baruth, Song of the Three Children, History of Susaunah, Bel and the Dragon, Prayer of Manasses, I. and II. Maccabees. In fold editions of the Bible, the Apocrypha is sometimes to be seen bound up between the Cd and New Testaments; but not in the recent authorized editions. Besides these, there are a number of other sp-called apocryphal books, which, however, have never hear regarded to a constant. been regarded as canonical. Among these, are the third and fourth books of Esdras, the book of Enoch, the Testament of the Twelve Patriarchs, the Assumption of Moses, the third, fourth, and fifth books of Maccabees, &c. Of the New Testament, there exist a number of spurious gospels, acts of apostles, and epistles. These works have been collected and published by Fabricius, in his Codex Pseudepigraphus Veteris Testamenti, and his Codex Apocryphus Novi Testamenti

Menti.

Apocryphal Controversy arose about thirty years ago, in connection with the British and Foreign Bible Society, and was occasioned by the discovery that part of the funds of the society were expended in the circumstance. culation of the Apocrypha on the continent of Europe On the one hand, this was defended on the ground of expediency; on the other, it was opposed as contrary to the constitution of the society, and to the principles of Christianity. At length, in 1826, the committee of the society resolved, "That the funds of the society be applied to the printing and circulation of the canonical books of Scripture, to the exclusion of those books and parts of books which are termed apocryphal." The controversy, however, was still carried on for some years with much vehemence and acrimony, until the apocryphalists were completely defeated.

apocryphanists were competely deseated.

Apocrymack, d. po-si-nai'-se-c((ir. apo, against, kuon, dog), in Bot., the Dogbane order of dicotyledonous plants, included in the sub-class Corollifore,—trees or shrubs generally having milky juices. The leaves are entire, and destitute of stipules. The callyx is or shrubs generally having milky juices. The leaves are entire, and destrute of stipules. The calyx is 5-parted and persistent; the corolla 5-lobed. There are five stamp as alternate with the lobes of the corolla; the filaments being distinct, the anthers united to the stigms, and the pollen granular. The ovary is composed of two carpels, which are generally merely in contact; when united, they form a 2-celled ovary; styles 2 or 1; stigms contracted in the middle, and expanded at the base and apex, so as to resemble in shape an hourglass, or a dumb-bell; ovules numerous. Fruit sometimes one or two follicles sometimes a capsule, drupe, or berry. Seed very rarely exalbuminous. The Dogbanes are natives principally of tropical regions, as few only occurring in northern latitudes. *Vinca*, the periwinkle, is the only British genus. There are 108 genera and 570 species. Some of the plants of this order are intensely poisonous, and all are to be suspected, though a few yield edible fruit. Some are drastic purgatives, and in some the bark is tonic and febringal. They have usually large showy flowers, and are on that account cultivated in our hothouses. Caoutchouc, or India-rubber, is prepared from the milky juice of several species.

prepared from the minsy pince of several species.

Apocynum, apo, y-unm, in Bott, the typical gen. of
the nat. ord. of plants Apocynacsæ. A. commalismus is
the Canadian hemp, an herbaceous plant from four to
five feet in height, with an unbranched stem bearing
oblong leaves, and cymes of whitish flowers. It yields
are yet with Amazica. oblong leaves, and cymes of whitsh flowers. It yields a very strong fibre, which the Indians of North America employ for making twine and coarse cloth. The roots of this species and A. androsamifolium are emetic, and slightly purgative.

Aponteric, dp-o-dik'-tik (Gr.apodeiktikos, demonstrative), is a term applied in Log. to those judgments or

sheep, goats, and swine. The poultry comprised hens, pigeons, pos-fowls, pheasants, geese, ducks, and swans. Bees were reared, and their honey esteemed a swans. Bees were reared, and their honey esteemed a valuable product on many Roman farms. Of the relative degrees of profit obtained on the various kinds of crops cultivated, Cato has bequeathed to posterity the following judgment:—"If, you can buy 100 acros of land in a very good situation, the vineyard is the first object, if it yields much wine; in the second place, a well-watered garden; in the third, a meion-plantation; in the fourth, an olive-ground; in the fifth, a meadow; in the sixth, a corn-ground; in the seventh, an underwood, or a plantation for yielding poles to train the vine; and in the ninth, a wood where mast grows." Such was Roman agriculture, which, in resilty, differs little from our own practice. We have superior implements, superior varieties of really, samers and from our own practice. We have superior implements, superior varieties of corn, are superior in the management of stock, and in our system of rotation crops. Beyond these, however, there is little difference between the modern English agriculturist and the ancient Roman. They are cared in intelligence in articles. English agriculturist and the amoent Roman. They are equal in intelligence, in enterprise, and perseverance. "What is good tillage?" asks Cato,—"to plough. What is the second?—to plough; and the third is to manure. The other part of tillage is to sow plentifully, to choose your seed judiciously, and in the season to eradicate as many weeds as possible." "Nature," he further observes, "has presented to us two paths which lead to a knowledge of agriculture. These are experience and imitation. Preceding husbandmen, by making experiimitation. imitation. Preceding husbandmen, by making experi-ments, have established many maxims: their posterity generally imitate them; but we ought not only to imitate others, but make experiments, not directed by chance, but by reason." Excellent advice, and wisely delivered !

Mediaval Agriculture. — The darkness which succeeded the fall of the Roman empire in the 5th cen tury, spread itself universally throughout Europe, and agriculture was either neglected, or entirely abandoned for such other modes of subsistence as lawless and for such other modes of subsistence as lawless and troublesome times might suggest. Accordingly, for nearly ten centuries, we know little or nothing of the progress of Agriculture; it then began to revive, first in Italy, and afterwards in Germany, France, and England. There is, however, nothing either useful or interesting to record regarding its advancement throughout this long succession of ages. War was the principal occupation of the various nations of the earth, and it was not till about the beginning of the earth, and it was not till about the beginning of the serious business of tilling these? 16th century that the serious business of tilling the soil seems to have received that degree of consideration to which its importance is entitled. By that time, some steps in advance had been made in Tuscany and Lombardy. In France a tract had appeared, written by a potter, and entitled "Les Moyens de devenir Biche," which contained remarks on rural and domestic seconomy, and which is the first agricultural work produced in France. In Germany, Conradus Heresbachius, who died in 1576, produced his work, entitled "De Re Rustica," which was published at his death, but which gives no information as to the state of agri-culture in his time. This was the first book on agricul-ture produced in Germany; and now that we have arrived at England, a more specific notice of its agri-culture is demanded from us.

English Agriculture.—When Cosar arrived in ancient Britain, 55 B.C., he found that the Cantii and the Belgm. severally inhabiting the modern counties of Kent, Somerset, Wilts, and Hants, cultivated the soil, and used marl as a manure. He also found that they stored used marl as a manure. He also found that they stored their oorn, but in an unthrashed state, only performing this operation when necessity required it of them. These conditions indicate a considerable amount of intelligence; but, besides these, the Roman conqueror found the country well peopled, and abounding in buildings, resembling those of the Gauls, with great abundance of cattle. He also found that they are abundance or nor harm you with that divergence. neither hens, geese, nor hares, notwithstanding that they took great pleasure in breeding them. Whatever were the impressions which his visits to Britain made upon Cæsar, it is to Agricola that its ancient inhabitants were mostly indebted for the improved arts and civilization of the Romans. He reduced them to a state of slavery by refining their pleasures; and, amongst other arts, improved their modes of agriculAgriculture

ture to such an extent as to enable them to store very ture to such an extent as to enable them to store very large proportions of their cereal produce. That this was the case is attested by the fact, that in the 4th century the emperor Julian had stored in granssies which he had erected, such a quantity of tributary corn as filled a fleet of 600 large vessels. Upon this fact, Gibbon, in his "Decline and Fall of the Roman Empire," makes the following comment: "If," says he, "we compute those vessels at only 70 tons each, they were capable of exporting 120,000 quarters; and the country which could bear so large an exportation, must have attained an improved state of agriculture, The early inhabitants of Britain, thus thoroughly initiated into the Roman practice of agriculture, never lost it. Although Saxons, Danes, and Normans, have grafted themselves on the various popumans, have grafted themselves on the various popu-lations of the island, the love of agriculture has still been preserved and followed with an assiduity and enterprise which never was at a greater height than it is at present.

Modern Co

dern Continental Agriculture .ing, the continental countries are far behind ourselves in agricultural practice. In order, however, to convey a general idea of the present state of European cultivation, we will notice the practice as it is pursued by several of those nations which are the most advanced, several of those nations which are the most advanced, and which necessarily devote themselves more to the culture of the earth than those who are in a more backward, and, consequently, in a less comfortable condition. Much instruction, however, cannot be obtained even from a lengthened detail of the various modes of husbardry pursued. All methods are pretty much alike, and even the implements employed bear a considerable resemblance to each other. These circumstances supersede the necessity of our doing more, here, than briefly indicating a few of those agricultural points in which some of the principal followers of the science differ, in practice, from ourselves.

agricultural points in which some of the principal fol-lowers of the science differ, in practice, from ourselves. For the products cultivated in the various countries specified, the reader is referred to the geographical articles in Beeton's Dictionary of Geography.

Flemish Agriculture.—The agriculture of the pro-vinces of Belgium, being founded on their manufac-tures and commerce, and being exempted from those changes to which these are incident, still continues to be the most fruitful source of wealth. The whole of Flanders is cultivated like a garden. Its farmers were our first tutors; and from the middle of the 17th to the end of the first quarter of the present century, the system of Flemish husbandry was a model of neatness and economy. The Flemings were the first among the and economy. The Flemings were the first among the moderns to grow crops for no other purpose than to plough them in when growing, and they follow this practice to a greater extent than any other nation. The system might have been suggested to them by the original barrenness of large portions of their soil, a great proportion of which consisted of harsh and berron sands. Practicing nathing but heath and sou, a great proportion of which consisted of harsh and barren sands, producing nothing but heath and fir. This, doubtless, also suggested the careful collecting of every kind of manure calculated to enrich the earth. "The care of the Flemish farmers," says Murray, in his "Encyclopædia of Geography," "in collecting manure was early conspicuous. The use of liquid manure, collected in large reservoirs, is common to this country, with China, and not known in any liquid manure, collected in large reservoirs, is common to this country, with China, and not known in any other part of Europe, except, perhaps, Norway. Turf sakes, especially those imported from Holland, are in high estimation, and are said to produce an almost magical effect on the vegetation of clover. In general, the Flemish agriculture is conducted on a careful, economical, antique practice, the farmiers not having adopted any modern improvements in the arrangement of husbandry, such as the creasing of the breeds of of husbandry, such as the crossing of the breeds of cattle, and the use of machinery, which have been adopted in England with such happy effect. But this system of agriculture, after supplying the most dense population in Europe with the standard productions of the standard productions of the soil, yields several articles, such as madder, rape,

the soil, yields several articles, such as madder, rape, clover, mustard-seed, hops, &c., for exportation.

Dutch Apriculture.—The husbandry of Holland is almost exclusively confined to stall-leeding and the dairy. This is forced upon the inhabitants by the natural humidity of their dimate. The country, from its geographical conditions, may be considered as nothing more than one great meadow intersected by

### Agriculture

A head

numerous causis, and traversed by rows and groups of numerous canais, and waversed by rows and groups or trees. In summer the cattle are kept grazing con-tinually in the open air, and in winter they are stalled and fed un hay, turnips, &c. Thus the great source of agricultural weath to the Dutch husbandman is the produce of the dairy, which he has brought to such perfection as to have become an object of exportation. Both the cheese and butter of the Dutch enjoy a high reputation throughout Europe.

German Agriculture.—The agricultural population of German y are mostly little farmers or small proprietors, who cultivate the soil with their own hands, and who, in the Teutonic states, form a class called bauer, who, in the removed consequence is, that although farming is pursued with great diligence, it is neither on such an extensive scale, nor with an equal amount of the intelligence with which it is carried on in England. With the exception of some of the mountain districts the form of the mountain districts the form of the mountain districts are the form of the mountain districts. of Salzburg and the Tyrol, where the spade is used, the plough is the universal instrument of cultivation. In the south the ox is the animal employed in tillage, and the horse in the north. In Holstein and West phalia, hedges divide the fields; but in other parts the phalia, hedges divide the nears; one in one possibilities expanse, apparently presenting to the eye an uncircumscribed boundlessness of vegetable fertility and beauty.

Italian Agriculture.—In Italy, the productiveness of the farm is said, by Mr. Forsyth, to be invariably in proportion to the smallness of the property. This is a result the very opposite of that which obtains in England, where, however, there is a less complicated England, where, however, there is a less complicated and more unright system of management than that which exists among the Italians. Whether the recent revolutions may affect the existing forms of copartner revolutions may affect the existing forms of copartnership amongst Italian agriculturists, remains to be seen;
but, at present, the stock of a farm is furnished half
by the landlord, and half by the tenant; and the
produce is divided equally between them. This lease
or contract holds only from one year to another; but if
the tenant pays his rent, and lives in peace, he is rarely
ejected from his holding. The system of irrigation which
obtains in Lorphards and Tusenavi is neglected. obtains in Lombardy and Tuseany is, perhaps, the most remarkable feature in Italian agriculture; and the opulence of these districts is mostly to be attributed opulence of these districts is mostly to be attributed to those works which, at an early period, the genius of the people constructed for the purpose of supplying their soil with water. "The squeducts, sluices, and other works connected with them," says Murray, "are still the admiration of engineers. They are now so divided and subdivided, as to convey the means of irrigative to the still the same of the same of the still the same of the sa tion almost into every field; and in this southern cline, where nothing, scarcely, but water is wanted, the increase of fertility is almost incredible. The produce is sometimes more than tripled; and grass may be mown three, four, and five times in the year." Where water is of so much value, it is natural to suppose that regulations would be imposed for its proper distribation and employment. Accordingly, every newly-lianovared suring is appropriated by the proprietor discovered spring is appropriated by the proprietor of the ground in which it appears, and is immediately converted into a little canel. In the vale of the Arno, irrigation is pursued on a most elaborate system. This is evidenced in the terraces which are formed on the is evidenced in the terraces which are formed on the sides of the steepest mountains, where the naked rock is covered with earth, and where the torrents of the Apennines are confined within walls, and made to render fruitful that which, before, was sterile. Canals now permeate every field, and could only have been made when the Florentine merchants were at the height of their prosperity. These works, at the present day, are maintained and kept in repair at an expense sufficiently great to be felt to press heavily upon the

People.

French Agriculture.—France is said to be the most favourable country in Europe for agriculture, yet are its inhabitants less forward in it than those of Great its inhabitants less forward in it than those of Great Britain. Their implements are, in general, rude, and the operations of the common farmer lack the intelligence of the same class in Britain. The French farmer performs most of this labours without the employment of extra hands, his wife and daughters—if he has them—reaping, threshing, and doing almost every part of the farm and garden work indifferently. Such farmers, according to Neill, prefer living in villages; society and the evening dance being nearly as indispen-

sable to them as their daily food. If the farm be distant, the farmer and his servants of all descriptions set off early in the morning in a light waggon, carrying set on early in the morming in a light waggin, carrying with them that provisions for the day. Large farms are rare in France; but where they do exist, they have generally farmeries upon the lands, where the work is mostly done by labourers, who, with the herdsmen employed, are frequently paid in kind. All the plants cultivated by the British farmer are also cultivated by the French, with the exception of the turnip, which is not generally grown, especially in the warm districts, where it does not bulb. Perhaps one of the most remarkable features in French agriculture, and of most warm countries, is the use of the leaves of trees as food for cattle. These are supplied in autumn by the mulberry, the olive, the poplar, the vine, find other deciduous plants, when their colour begins to change. During the winter they are given to the cattle and sheep like hay, and are, sometimes, boiled with grain or bean for cows.

Such is a sketch of the progress and state of agricul-ture in those countries which approach nearest to our own in the practice of that science. Every nation, however, being generally less advanced than ourselves, no instruction can be furnished by giving an account in

no instruction can be furnished by giving an account in detail of their defective systems. For a consideration of the practical part of agriculture as pursued in England, see Soil, Manuer, Drainage, Crofs, Farmanials, Ploughing, &c.
Arbenonia, ig,-i-mo'-ni-\(\tilde{a}\) (Lat.), the Agrimony, a genus of dicotyledonous plants, belonging to the Rose order, or Rosacea. The species A. Espatoriu is one of our common roadside plants, and is found in flower about June. The leaves are very handsone, being large, and doorly git at the adjourned divided graphers. large and deeply cut at the edge, and divided even down to the main stalk; the flowers are yellow, arranged on a long simple spike, with a little leaf at the base of each, and the fruit is beset with bristles. This plant has been used in medicine as a vermifuge and an astringent.

astringent.

AGEIONIA, & f-ri-o'-mi-a (Gr. agrics, rustic, rade), among the ancients, an annual festival in honour of Bacchus, which was usually celebrated during the night. According to Plutarch, it was so named on account of the rudeness and intemperance which generally attended its celebration.

AGEORTEMMA, & f-rox-tom'-ma (Gr. agros, a field, stemma, a crown), in Bot., a genus of dicotyledonous plants of the Pink order, or Caryophyllacee. The species A. githago is the common corn-cockle, a well-known ornamental plant in our cornfields.

AGEORTIS, & f-rox-tis, in Bot., a genus of Grasses, including nume? Your species, all furnishing excellent forage.

forage.

Agnown, a-ground (Ang.-Sax.), in Mar., a term signifying the situation of a ship, whose bottom, or any part of it, hangs or rests upon the ground, so as to render her immovable till a greater quantity of water shall float her off, or till she shall be drawn out into the stream by the application of mechanical powers.

AGUE, or INTERMITTENT FEVER, ai gu (Fr. aigue, sharp), in Med., a disease generally occasioned by exhalations arising from marshy grounds, stagment water, or decaying vegetable substance. It is charac-terized by a series of separate attacks, occurring at regular intervals of one or more days, according to regular incervals of one or more days, according to which it is termed quotidium, tertian, or quartan. Each attack is divided into three stages, which follow each other in regular succession. The first, or cold each other in regular succession. The first, or cold stage, is characterized by a feeling of extreme cold and languor, and an uncontrollable tremor over the whole body. This is followed by the hot stage, when the skin becomes hot and dry, the pulse quick and full, and the features flushed. In the sweating stage, a profusion of sweat breaks out over the whole body, which continues for some time, and then the attack the stage of the terminates. During the cold stage, warm baths, diaphoretic drinks, and such-like means, are to be adopted; in the hot stage, saline draughts and diaphoretics should be administered; and in the last stage, the patient is to be kept cool, and, if very weak, may receive a little wine or brandy-and-water. The general treatment in ague is to strengthen the system by means of tonics, such as quinine or Peruvian bark.

AHBAD, a-hed (Ang.-Sax.), in Mar., a term signi-

Air-Gun

fying further caward than the ship, or at any distance before her, lying immediately on that point of the compass to which her stem is directed. It is used in

compass to when mor stem is directed. It is used in opposition to astern, which expresses the situation of an object behind the ship.

ARBIAN, air-t-an, in Geol., a term applied to the middle group of the series of Devonian rocks belonging to Belgium and the Rhine. This group includes bluish

grey grits, sandstones, and shales.

Anut., i-hul' (Ang.-Sax.), in Mar., a term signifying the situation of a ship when all her sails are furled, and her helm lashed on the lee-side: she then lies nearly with her side to the wind and sea, her head being somewhat turned to the direction of the wind.

somewhat turned to the direction of the wind.

A1. (See Bradyrus.)

ARIMAG LOTABUR, aik-ma-lo-tark (Gr. aichmalotar-ches, chief of the captives), in Ecc. List., a title given by the Jews to the prince by whom they were governed whilst in captivity at Babylon. According to the Hebrew writers, he was always of the tribe of Judah. It has, however, been doubted whether such a dignitary held office previous to the 2nd century when Huna held office previous to the 2nd century, when Huna was appointed sichmalotarch.

A1D, aid (Fr. aide), in Law.—Aids were originally more benevolences granted by the tenant to his lord, in times of difficulty and distress; but, in process of time, they grew to be considered as a matter of right, and not of discretion. These aids were principally three:—1. To ranson the lord's person, if taken prisoner. 2. To make the lord's eldest son and heir-apparent a knight. 3. To marry the lerd's eldest daughter, by giving her suitable portion.—Ref. Bracton; 2 Bl. Com. 63.
AIDR-DE-CAMP, aid'de-kan, a Mil. term, taken from the French, and denoting an officer employed to re-

ceive and convey the orders of a general:
Alguer, ai'-glet, in Zool., a young eagle.

EAGLE.)

AIGRET, or EGRET, as -gret, in Bot., a term formerly applied to a little feathery crown or tuft attached to the seed-case or fruit of the dandelion, the scabious, and many other plants, and by means of which the seed is transported through the air to a distance. This peculiar appendage is now called a pappus. (See Paprus.)

AIGUILLETTES, or AIGLETS, ai'-glets (Fr.), the metal sheathings or tags at the end of the ribbons used to tie different pertions of the costume worn in the 16th and 17th centuries. The significations were sometimes gold and silver, and elaborately chased. The pictures of Holbein, and the portraits of his time, give many examples of their form, and Shakspere and many of the clder dramatists allude to them.

Arousce, ai-giseau (Fr.), in Hera a term employed to denote a cross which has the two angles at the ends cut off, so as to terminate in two points, in opposition to the cross fitche, which tapers to a

point.

AILERTIES, or AILERONES, ai'-lets (Fr., little wings), the original design from which the modern epaulette was taken. Their object was to furnish a proservice, they were made of leather, and ornamented with a personal findge or device, or the heraldic bearings of the wearers. They came into fashion in the earlier portion of the reign of Edward II., and ceased to be wore during the reign of Edward III. Dress allettes were made of leather covered with silk or cloth, with fringes, and were laced to the shoulders of the hauberk with cords of silk.

AIM FRONTLET, aim frunt'-let, in Mil., an instrument formerly used by gunners to level and direct their

Are, air (Gr. aer, air).—This term is generally taken to mean the atmosphere with which our globe is sur-rounded; but in the chemical works of the last century it is often applied to bodies known at the present day as gases. Air is a mechanical mixture of two gases, oxygen and nitrogen; in the proportion, by measure, of 20 ell oxygen to 70 l9 nitrogen; or by weight, 23 el oxygen to 76 el nitrogen. Besides nitrogen and oxygen, it contains small quantities of carbonic acid and aqueous vapour, differing according to the locality and weather. Air, in common with all other bodies, has a perceptible weight. This is proved by weighing a flask before and after it has been exhausted of its air.

According to Biot, 100 cubic inches weigh 31 Heat causes air to expand, cold to contract. To cupping glass is a familiar instance of the former is 1f a bladder is half-filled with air, and held near a it it will expand until the bladder is quise full; on ber it will expand until the bladder is quite full; on being taken away, it contracts gradually to its former bulk. Air being clastic and compressible, it follows, that the higher we go, the lighter the air becomes. (For dissolves a definite amount of aqueous vapour at different temperatures; hence the sudden formation and disappearance of clouds. In large masses sir has a blue tinge. The distant hills appear of this colour, from being seen through several miles, of has a blue tinge. The distant hills appear of this colour, from being seen through several miles of air, and the sky appears blue from the same cause. As stated above, air consists of oxygen and nitrogen. Were it composed of oxygen only, we should breaths away our bodies too fast, while nitrogen alone would kill us. By the mixture, a proper strength of air necessary to life is kept up. The perfect mechanical mixture of the two gases which form air is an excellent example of the diffusion of gases. When two gases are united, they gradually mix with each other nutil perfect diffusion takes place. The air, therefore, that is analyzed at the foot of Chimborazo has the same composition as that analyzed at the has the same composition as that analyzed at its summit, though it differ materially in density. Dr. Frankland has lately discovered that combustion takes place in proportion to the density of the air. A candle, weighing an ounce, took a longer time to burn at the top of Mont Blanc than one of the same size and weight which was burnt in the valley of Chamounix. weight which was burnt in the valley of Chamoning. From this it follows, that human beings must breathe slower in valleys and quicker at greater attitudes. The air is continually being rendered impure by the breathing of animals, the oxygen it contains being transformed into carbonic acid. This, however, lasts but a short time, being quickly separated into carbon and oxygen by plants, which retain the former body for their own nourishment, releasing the latter to serve again as support for animal 140.

AIR, in Music, a term which, when applied to vecal music, signifies a composition for a single voice. It is synonymous with "melody."

Ath-Balloon. (See Balloon.)
Arb-Beds.—An air-beds consists of a sack, in the shape of a mattress, divided into a number of air-tight compariments, a projection at one end forming the holster. Each compartment is provided with a valve, and can be inflated with air by means of a believe. Air-beds were known at the commencement of the 18th century; but, being manufactured of leather, were of considerable cost. They are now made of mackintosh cloth and vulcanized india-rubber. Their advantages are coolness, elasticity, and portability; and they are especially valuable to invalids.

AIR-BLADDER, an organ which, in fishes, generally adapts the specific gravity of their bodies to the weight of the water in which they are at different depths.

AIR-CUSHIONS are conveniences of similar construction to air beds, but less complicated, and chesper.

AIR-ENGINE.—A machine analogous to the steam-engine, in which rarefled or condensed air takes the place of steam. Many engines of this kind have been patented and used experimentally. There are many difficulties in connection with the employment of air in lieu of steam, which prevent them from coming into general use.—Under CALORIC ENGINE will be found accounts of several, which have been successfully worked by means of hot air.

AIR-GUN .- An instrument through which bullets are propelled by means of the sudden escape of comare propelled by means of the studies escape of com-pressed air. In appearance they are similar to ordi-nary arms, the stock of the gun being the reservoir into which the air is forced by a condensing syringe. There is a valve immediately behind the bullet, through which a small quantity of compressed air rushes as soon as it is opened, by pressing the trigger with the finger. As soon as the trigger is released, the valve closes again. There are too many objections to their onger. As soon as the trigger is released, the tarve closes again. There are too many objections to their use, for air-guns over to gain a higher position than that of destructive philosophical toys. The amount of force required to be expended in condensing the air, the gradual diminution of power after each shot is fired, and their liability to get out of order, effectually

#### Air-Jacket

preclude their general use. It is said that they were invented by Marin, a native of Lisieux, in France, who presented one to Henry IV.

ALE-JACKET, a garment, formerly made of leather, and now of other materials, having several bags communicating with each other, which were filled with air by a leather tube, furnished with a brass stop-cock, by which means a person may float without learning to

ARE-PASSAGES AND AIR-CELLS, in Bot., are large intercellular passages and spaces occurring in the stems and leaves of some monocotyledonous plants, espe-cially those which are aquetic.

Ale-Pires, commonly called Sutton's air-pipes, from the name of the inventor. They are formed on the principle, that air is necessary for the support of fire, and were contrived to cleanse the holds of ships of foul sir. This was done by closing the two holes under the copper or boiler, and in their room laying a copper or leaden pipe from the hold into the ash-place, by which means the foul air was discharged from the hold, and a supply of fresh air from the hatches allowed to

AIR-PLANTS, in Bot., are those members of the vegetable kingdom which derive nourishment entirely from the air by means of slender agrial roots. Most of the Oscilida - 1 of the Orchids and Tillandsias, which grow on the trunks and branches of trees in warm climates, are true The term epiphytes is sometimes applied to

such plants. -As its name indicates, an air-pump is a AIR-PUMP. machine for extracting the air from a closed vessel, so as to form as near an approach to a vacuum as possible. It is composed of a cylinder, in which works a piston, furnished with a valve opening upwards. At the bottom of the cylinder is another valve, also open. ing upwards, and closing or opening a tube connected with the plate upon which is placed the vessel to be exhausted. If the piston is raised when it is at the bottom of the cylinder, the air pressing on the valve belonging to it keeps it closed, and a partial rarefaction of the air takes place. On lowering it, the air presses on the valve at the bottom of the cylinder, cutting off the communication between it and the receiver, and opening the valve in the piston. The piston, on being raised once more, again rarelles the air in the receiver. and continues to do so at each successive stroke of the and continues to do so at each successive stroke of the pump. An absolutely perfect vacuum can never be made in this way, as, at a certain point, the rarefled air becomes too attenuated to lift the piston-valve. In most air-pumps two cylinders are used, to save time; the piston of one descending while that of the other is ascending. Combected with the tube leading to the receiver is a shortened barometer, the height of the mercury in which shows the exact degree of rarefaction. The air-pump was invented by Otto Guericke, in 1690. (See KENNEDY'S AIR-PUMP.)

AIR-SACS. in Bot., small membranous pouches filled

AIS-SACS, in Bot., small membranous pouches filled with air, which form the floating apparatus of the

Bladder-wort (see this word).

Arm-SHAFTS, in Mining, holes made from the surface to the adits, to furnish fresh air to the miners. ARTHERMOMETER.—This instrument, which is seldom used, consists of a capillary tube, open at one end, and terminating at the other with a large bulb, full of sir, which is separated from the external atmosphere by a liquid index of coloured sulphuric acid, which rises and falls as the air in the bulb contracts or expends.

AIR WEELDS, a term in Nat. Hist., applied to those filaments which float in the air in autumn. They are made by the long-legged field spiders.

AIRLE, ile (Fr. ails, wing), in Arch., denotes that lateral division of a church which forms the side of the edifice. Thus, when a church is divided into three compartments, the middle or principal compartment is called the nave, and the two outlying compartments form the aisles. English churches have seldom more than two aisles; but in foreign ecclesiastical edifices there are often as many as four aisles, two on each side of the nave. Sometimes the term sisle is given to all the compartments of a church, which is then spoken of as "three-sisled," the nave or body of the building forming the middle aisle, and the side compartments the side-sisles. (See Church, Transfer, Navr.)

#### Alauda

AJUGA, a-joo'-ga, in Bot., the Bugle, a genus of plants belonging to the Labiste order. A. reptans is a common plant in moist pastures. The stem is creeping, but the belonging to the Labinate truer. It is to me is oreeping, but the flowering part erect. This part has many leaves or bracts of a purplish hue, proceeding from each whorl of labiate flowers: the latter are generally blue, sometimes white or flesh-coloured. The plant was formerly

thought good for wounds.

AKER FRUIT, a-ke', in Bot., the produce of a species of seapwort growing in the West Indies. (See

CUPANIA.)

AKI, ai'-ki, in Bot., the native appellation for the Lignum vite of New Zealand. This and other species of the genus Metrosideros afford valuable timber, used by civilized races in many of the peaceful arts, and by the South-Sea Islanders to form their terrible clobs. The

genus belongs to the Myrtle order, or Myrtaceæ.

ALBEMM BEDS, bl-a-bal-ma, in Geol, a group of rocks in North America, placed by Sir Charles Lyell among the productions of the middle Eocene period.

ALBESTER, bl-a-bas-ter, in Min., a white substance mad for organization through the productions of the middle Eocene period.

ALBASTER, a.-d-06x-ter, in Min., a wave substance used for ornamental purposes. Its name is derived from Alabastron, in Egypt, whence the ancients obtained a supply of the stone, and where it was manufactured into vases and other small vessels. The ancients made use of these vessels to hold a certain kind of perfune, with which vessels to the certain kind of perfune, with which, according to Horace, it was the custom to anoint the heads of the guests at a feast. Mary, the sister of Lazarus, poured a "very precious ointment" from an alabaster box upon the head of our Saviour whilst seated at supper. In the British Museum there are several of these ancient alabaster vessels. There are two varieties of alabaster; one a carbonate of lime, and the other gypsum, or sulphate of lime, the latter being that which is generally known as alabaster. It is a soft stone, may be scratched with the nail, and is beautifully white and semi-transparent. Being easy to work, large quantities of vases, lamps, and toys, are made from it. The finest sort of alabaster is obtained from Valterra, in Tuscany, and it is also found in Derbyshire and Staffordshire.

ALABASTRUS, di-les-trus, in Bot., a name some-times given to the flower-bud. Al.E., ai'-lee (Lat., wings), in Bot., the two lateral petals of a papilionnecous or butterfly-shaped corolls. ALANGIACE E. all an ge-ai's se-e, in Not, the Alangium order of monocotyledonous plants, including four genera and eight species, which are trees or shrubs, natives of various parts of the East Indies, and North America. The fruits of most of these plants are edible; that of the Nyssa apilata is used as a subtitute for lime-fruit, and is sometimes called the Ogechee lime.

nme-rrut, and is sometimes called the Ogechee lime.

Alara, a. &-r-ac, is the name given by Mahometans
to the wall which they say divides heaven and hell.

Alara, a-lair'-ees, in Rom. Mil. Antiq., a kind of
militia; but, according to some, they were the cavalry,
stationed as the two wings or alw of the army.

Alaria, a-lair'-i-a, in Bot., a genus of fuccideous
sea-weeds. One British species is known, A. esculenta,
a common sea-weed, having a large flat and narrow
leaf-like frond, with a thick midtib. or prolemention of leaf-like frond, with a thick midrib, or prolongation of the stalk by which it is attached to the rocks. It grows from four to twelve feet long, and is sometimes employed for food. Its common names are Bladderlocks. Hen-ware, and Honey-ware.

ALAMA, a-larm', a sudden surprise occasioning fear or terror; an outery intimating the approach of dan-ger. In Mil., it denotes either the apprehension of being attacked, or the notice given of a sudden attack,

as by firing a rifle, &c.

as by firing a rille, &c.

ALAEMISTS, a-larm'-ists, in Pol., a term applied generally to those persons who are easily alarmed at the first whisper of bad news, who industriously circulate it, and exaggerate its probable consequences. In Politics, it particularly designates those individuals who fear any change of policy, or alteration of recoined towns. ceived forms.

ALAUDA, a-law'-da (Lat. alauda, a lark), in Orn., the lark, a genus of birds, belonging to the conirostral tribe of the order Pauseres, and fam. Fringilidae. Charac. Beak cylindrical; nostrils concealed; head orested; tail forked wings long; no spurious quill; the first, second, and third quills longest, and nearly equal; the rest considerably graduated. Various species of larks are found in all quarters of the globe. The skylark, or laverock (Alauda arvensis), is the best known in this country. He is unrivalled as a songster, and has been a theme for poets from the earliest ages. and has been a theme for poets from the earliest ages. The male alone is gifted with melody; the female makes her nest among the herbage or opra, and devotes herself almost constantly to the process of incubation. They are granivorous birds, of migratory habits, and, instead of washing, shake dust among their feathers. They are considered a great delicacy for the table. The season for eaching larks commences, in this country, in the middle of September, and terminates at the end of February. More than 4,000 dozen are annually supplied to the London markets alone. The Alauda arrensis, or skylark, and the Alauda arborea, or woodlark, are the only ones that sing when flying. or woodnark, are the only ones that sing when hying. The skylark rises perpendicularly, the woodlark in wildlysextended circles; and they sometimes soar to an enormous height, and sing for an hour together. The shorelark (Alauda alpestris) is frequently found in North America, and generally breeds near the seashore. The calaudra lark (Melancorypha calaudra) is a larger bird than the skylark, and possesses a more sonorous voice. In Italy, a good singer is compared to a calandra. Among other species, there are the pratensis, or titlark, which frequents meadows;—the arborea, or woodlark, distinguished by a white fillet about the head. It is less than the skylark; the colours are paler, and the voice less varied, but sweet. The campestris has half of the chief feathers of the The competers has half of the chief feathers of the wings brown, except two, which are white, and the throat and breast yellowish. The trivialis, whose tail is partly brown and partly white, is a native of Sweden. The cristate, a native of Europe, and sings like the skylark. The spinoletta, a native of Italy. The magna, common in Africa and America. The New Zealand lark, which inhabits Charlotte Sound, where it is named known course.

it is named kagoo arours.

Alb, ilb (Lat. albus, white), an ecclesiastical vestment of great antiquity, made of white linen, of sufficient length to hang down to the heels, open in front like a surplice, tight in the sleeves, and girded at the loins. In the ancient church, the newly-baptized persons were a white vestment or all; whence the Sunday after Easter, the day upon which the cate-chumens received haptism, came to be called Dominica in albis—whence Whit-Sunday.

ALBATA. (See NICKEL.)

ALBATA. (See NICERA.)

ALBATROSS, 8th-ba-tross (Diomedia), a gen. of webfooted birds, of which there are three species,—the common albatross, D. exulans; the sibatross of China, D. fuliginosa; and the yellow-and-black-beaked albatross, D. chlororynchos. Charac. A long, hard beak, curved at the extremity, the upper man-Charac. A long,



ALBATROSS

dible composed of several articulated pieces, the! lower mandible smooth and short; the nostrile lateral, and placed like small rolls in the furrow of the mandible; feet short, with the three toes long and completely webbed; wings long and narrow. The common albatross, which is often met with in the seas of

Southern Africa, is the largest sea-bird known; its weight varying from 12 to 28 bs. A specimen in the Leverian Museum measured 13 feet between the exbird, shot off the extended wings. One remarkably large bird, shot off the Cape of Good Hope, measured from wing to wing 17½ feet. The top of the head is a raddy wing to wing 173 feet. The top of the head is a rad grey, the rest of the plumage, with the exception several transverse black bands on the back, and a fe of the wing-feathers, is white; the bill is of a pale yellow, and the feet and membrane of a deep flesh colour. Towards the end of June these birds however conour. It owns the end of some cases thrus mover in immense flocks about Behring's Straits and Kambeschatka, attracted thither by the shoals of fish, whose migrations the albatross persoveringly follows. So great is their voracity, that they will awallow a salmon

of 5 bs. weight; they do not, however, limit their diet to fish, but will prey on any sea animal.

ALBIGUNES, dib-bi-per-sees, was a common name given to the different sects that existed in the south of France in the latter half of the twelfth and beginof France in the latter half of the twelfth and beginning of the thirteenth ceutury. They differed among each other in their particular tenets, but agreed in denying the authority of the pope in spiritual matters, and in opposing the discipline and ceremonies of the Church of Rome. They were so called from the town of Albs, or Alby, in and around which they were most numerous. In 1183, Alexander III. published a decree against these sects in a council at Tours, and another in 1179. On the accession of Innocent III, to the paoff chair, in 1198, he sent two Innocent III. to the papel chair, in 1198, he sent two Cistercians, Rainer and Guido, to proceed against the heretics. They were to endeavour to convince them by arguments, and, if these failed, to pronounce the ban upon them. Their goods and property were to be by arguments, and, if these failed, to pronounce the ban upon them. Their goods and property were to be confiscated, and themselves banished from the country. These proceedings, however, were followed by little success; and the assassination, in 1208, of one of the pope's delegates, Peter of Castalnau, who had rendered himself odious by his cruelties, gave rise to many years of a most bloody war, in which the worst outrages of fanaticism and cupidity were practised against the inhabitants of these districts. Raymond VI., count of Toulouse, was leader of the Albigenes, and Simon, count of Montfort, commanded the expedition against them. At the taking of Beziers, it is said that 60,000 them. At the taking of Beziers, it is said that 60,000 of the inhabitants were put to the sword; and it is said that one of the pope's legates, when asked how they were to distinguish the heretics from true Catholies, replied, "Kill all, and God will find out his own."
Montfort lost his life at the siege of Toulouse, in 1218,

Montfort lost his life at the siege of Toulouse, in 1218, and Raymond, his adversary, died in 1222. The war was prosecuted by their successors, until RaymondVII., pressed on all sides, was obliged to make peace in 1229, giving up two-thirds of his estates to the king, promising submission to the pope, and paying a large sum to the Church. He died soon after and in him the house of the counts of Toulouse became extinct, and its territories reverted to the French crown. When peace was obtained, the Inquisition was established at Toulouse, and those who escaped from the aword died by the those who escaped from the sword died by the

hands of the Inquisition.

ALBINO, al-bee'-no (from Lat. albus, white), person of a preternatural whiteness of the skin and hair, and peculiar redness of the pupil of the eye, which, in some cases, is so weak as not to be able to bear the light of day. The not to be able to bear the light of day. The Portuguese first applied the term to the white negroes whom they found on the coast of Africa, but it is now used to designate persons who exhibit similar characteristics, of whatever race.

AL-BORAK, al bo-rak' (Arab., shining whiteness), the name given, in Mahometan tradition, to an imaginary animal, which was said to have carried Mahomet upon his journey from Jerussalem to the heaves.

salem to the heavens. ALBUM, all-bum (Lat. albus, white), among the

Romans, was a white board or register, on which the names of persons or public transactions were in-scribed. The term is now usually applied to a book for receiving autographs or other manuscript contri-

butions of friends or celebrated individuals.

ALBUNEN, äl-bu'-men (Lat. albus, white), in Chem., a whitish viscous matter slightly salt to the taste, and

### Albuman

an important element in vegetable and animal organic substances. It is distinguished by its peculiar property of becoming coagulated or insoluble at a high temperature. White of egg as entirely of albumen. White of egg and serum of blood consist almost The hair and nails contain large quantities of it in its cosmilated state. Pure albumen is insoluble in water. White of egg and serum contain a certain amount of free alkali, in which it is distain a certain amount of free alkall, in which it is dis-solved; hence its precipitation when acids are added. It is also precipitated when salts of mercury, copper, silver, lead, &c., are added to its solution, forming with them definite insoluble compounds. This property renders, it valuable as an antidote to metallic poisons. Tannin, gallic acid, and extractive matter behave with it in a similar manner; for which reason it is used much in the arts as a clarifying agent. It is greatly used in photography, for giving depth and intensity to photo-graphic prints. Its chemistry is very complex, and requires investigation. Its composition is given below, the presence of sulphur being rendered familiar to all by the effects of cooked eggs upon silver spoons. by the effects of cooked eggs upon silver spoons.

Carbon .			•	٠.	53.5
Hydrogen				.,	7.0
Nitrogen .					15 5
Oxygen .				i.	22.0
Phosphorus		-			0.4
Sulphur .	-				1.6

A seed entirely devoid of this structure is said to be exalbuminous, and one which includes it, albuminous. The cells of the albumen contain nutriment for the germinating embryo in the form of starch, of oil, or of cellulose. Sometimes the cells are thickened by secondary deposits, and the whole structure becomes horny; thus, vegetable ivory is nothing more than the albumen of the seed of a species of palm. The stone of the date, and the nut of the areca paim, are further examples of hardened albumen. In the seed of the coffee-plant, the albumen is the horny portion which is so familiar to us as the "coffee-berry." When a seed contains no albumen, the cotyledons sup-When a seed contains no ablumen, the cotylectons supply the nutriment required by the growing portions of the embryo. Some botanists use the term perisperm for this structure, as the word albumen has a totally different signification in chemistry.

ALBUMENIZED PAPER. (See PHOTOGRAPHY.)

ALBUM GLECUM. (See TANNING.)

ALBURTUM, il-bur-num (Lat.), in Bot., the sap-wood, the white and comparatively soft part of an exogenous stem, hetween the inner bark and the decrement.

stem, between the inner bark and the duramen, or heart-wood. The difference between these two kinds heart-wood. The difference between these two kinds of wood is often very striking. Thus, in the ebony-tree the duramen is black and the alburnum pale. All the vital functions are performed by the sap-wood, as is proved by the vigorous growth of many a hollow tree. ALCA, or AUE. (See AUE.)
ALCATO, J.L.WI-L., a name given to a kind of verse said to have been invented by the Greek poet Alcaus.

It is formed of four feet, with a cæsura in the middle. The first foot is a spondee, rarely an iambus; the second an iambus; then the cæsura, followed by two

datyls; as—
Dûlee et | décêirum est | prê pêtrîja mêrî.

It is sweet and glorious to die for one's country.

Alcarder, or Accarder, al-kaid', a Spanish word,
dorired from the Arabic kada, to heed or govern, and used by the Moors, Spaniards, and Portuguese for a governor, usually of a fortress or castle.

Alcalde, al-kal'-dai, is, in Spain, the title of a judge sprointed by the government, or elected by the towns, to administer justice within a certain district.

Anomaran, Krights of al-kan-ta'-ra, an order of Spain, uniting in themselves both religious and military duties. They took their denomination from the town of the same name, on the Tagus, and had their rise about the beginning of the 13th century.

ALGARRAZAS, al-kar-ra'-zas, a name given to aspecies of course pottery, manufactured in Spain, and used for

### Alchemy

cooling wines. This is effected by means of its extreme porosity, the wine passing through the pores, when a copious evaporation takes place from the small pora copious evaporation takes place from the small por-tion of water which penetrates to the outside. It is made of clay, consisting of sixty parts of calcareous earth, mixed with alumins, and a little peroxide of iron, and thirty-six of silicious earth, mixed with a little alumins; to which a quantity of salt is added in the mixing. The vessels are only half, or at least not the mixing. ! wholly baked.

wholly baked. al-ka-va'-la, in Com., a custom-house duty paid in Spain, on imported goods, at the rate of 5 per cent. upon the value of the commodity.

ALCEDO, or KINGTISHER, ül-se'-do, a family of birds belonging to the fissirostral tribe of the ord. Passeres. Charac. Bill long, thick, pointed, and quadrangular; tongue short, and slightly arrow-chapted at the point; nostrils at the side of the base of the bill; legs short; three tocs, the outer joined to the middle one as far as the second joint; wings with the first and second quills nearly equal. Only one species of kingfisher is indigenous to Britain, though there are sixty other species described by naturalists. This bird was known to the ancients by the name of Halcyon. They supposed that its nest was built upon the surface of the sea, and that during incubation it Oxygen

Phosphorus

10

ALESURAR, in Bot., a term used to denote the cellular structure which surrounds the embryo of a were called Haleyon days. The Ostiacs and present in every case; for sometimes the ambryo alone forms the nucleus of the seed, as in the pea, the bean, and the wallflower. When it is the pea, the bean, and the wallflower. When it is woman touched by a feather which has foated on the amount of space it occupies is in inverse woman touched by a feather which has foated on the water, will full in love with the man who uses it.

The most remarkable among the species are:—1.

The most remarkable among the species are:—1. plumage a bright green, glossed with copper and gold. This species is found in Guiana and Brazil, and feeds on insects.—2. Alcedo ipsida, or common king-flisher, about the size of a swallow; bill long, and the shape inelegant; top of the head and the coverts of the wings of a dark green, spotted with light blue; back and tail of a bright azure; the under side of the back and tail of a origin azure; one unure since or such body orange. It feeds on fish.—8. Alecdo paradisa, or paradise jacamar, of the same size as the preceding; throat, front of the neck, and under wing-coverts, white, the rest of the body a dull green, slightly shaded with black, violet, and copper. It is a native of the body as dull green, slightly shaded with black, violet, and copper. shaded with black, violet, and copper. It is a native of Surinam.—1. Alcedo ridis, or Egyptian kingfisher, about the size of the Royston crow; bill black; head, shoulders, and back, brown; throat and belly dusky white; tail ash-coloured; the legs of a pale green, and the claws back. It is a native of Egypt, and feeds and the claws have. It is a native of E5 ps, and rects on frogs, insects, and small fish.—5. Alcedo cayenesis; about the size of a starling; back of a blue colour, the under parts white, and the legs red. It is a native of Cayenne and Guiana.—6. Alcedo torquata, or cinereous kingfisher, about the size of a magpie; colours, a bluish ash, chestnut, white, black, and yellow. It is a native of the West Indies.

ALCES, dl-sees, the Elk. (See Dren.)
ALCHEMILLA, dl-ke-mil'-la, in Bot., the Lady's-mantle, a gen. of plants in the nat. ord. Rosacea, subord, Sanguisorbea. Three British species are known.

ord. Sanguisorbea. Three British species are known,—
A. alpina, A. valgaris, and A. arcensis.—the mountain,
common, and field lady's-mantles. They have small
green flowers arranged in bunches. The latter species
is thought to be diuretic.
Alchemy, ill-kim-e (Arab. al, the, Gr. chemia,
chemistry).—The term alchemist is generally applied,
in an opprobrious sense, to the ancient chemists,
who are vulgarly supposed to have been mere
visionaries, searching only after chimeras Although
many of the alchemists were invostors, working upon many of the alchemists were impostors, working upon the minds of the unenlightened for their own ends, still there were many more really great men amongst them, who, by their genius and labours, have laid the foundations of modern chemistry; men who made discoveries amidst inconceivable difficulties, that we nowmays have no notion of. Such men as Paracelsus, Raymond Lully, Glauber, Friar Bacon, Van Helmont, Albertus Magnus, Basil Valentine, and a boot o. others, have left behind them enduring monuments of their greatness, in the form of medicines and preparations,

### Alcohol

indispensable to the chemist and pharmacist, even in these enlightened days. The great end of all their researches was the discovery of the philosopher's stone, which was to have the power of transmuting all metals into gold. Their ideas in this matter were perfectly reasonable and logical. They found, that by burning and melting, ut a great heat, a gull, heavy, earthy body, they obtained a brilliant metal; and further, that by treating in the same way lead ore, a semi-metal, they



ALCHEMIST, AT WORK.

produced a perfectly metallic substance. From these facts, they reasoned that gold and silver were pure forms of baser metals, and their experiments tended forms of baser metals, and their experiments tended to the discovery of the agent which was to work this change. In the same way, following out this train of reasoning, they imagined that this great purifier of metals would play the same part with the human subject, and purify it so effectually as to prolong life indefinitely; hence the search after the clixir of life. The idea of the universal solvent is not so absurd as it is made to appear. Their notion in this was to obtain a solvent for all metals, and not for all substances will represent supposed.

stances, as is generally supposed.

stances, as is generally supposed.

ALCONOT, dit-kg-hol (Arab. al, the, kooll, any volatile substance).— If a solution of sugar he exposed to the air for any length of time, no change will take place; but if vegetable or animal organic matter he present, fermentation commences, and a fresh principle is formed, which may be separated by distillation. The first distillate is comparatively weak; but by the use of caustic potash, which has a powerful afflinity for water, absolute alcohol is obtained. Pure alcohol is colourless and limpid, pungent to the taste and smell. Its specific gravity at 60° is '7938. It boils at 173°, and has been rendered gelatinous by cold, but has never been frozen. It is very inflammable, and has never been frozen. It is very inflammable, and burns without smoke. It mixes with water in all proportions, and has a great attraction for it. Its solvent powers are great, especially with respect to resine and resinous gums. The strength of alcohol is in exact powers are great, especially with respect to resists and resistous guins. The strength of alcohol is in exact proportion to its density, which is estimated by means of an hydrometer. Excise proce spirit has a specific gravity of '918, and contains 49½ per cent. of absolute alcohol. Wine, beer, and spirits owe their intoxicating properties to alcohol. The chemical composition of alcohol is C.H.O., and it is regarded by chemists as a hydrated oxide of the organic base ethyl; i.e., C.4H.6O+HO. In like manner, methylic alcohol is hydrated oxide of methyl, C.H.O.+HO, amylic alcohol; the simple oxides being citylic, methylic, amylic, and capric ethers. (See ETHER.) The alcohols are very numerous, their number being increased daily. Alcohol of different strengths is much used in the arts, as a solvent for varnishes, resins, and essential oils; as a fuel in spirit-lamps, as an antiseptic, and as a stimulant in medicine.

# Aldehyde

wine and spirits depends mainly on the amount of alcohol they contain, it is of the greatest consequence that it should be easily and quickly found. In the case of spirits, which consist mainly of alcohol and water, this is comparatively easy, the specific gravity being in direct proportion to the amount of alcohol in the mixture. A specific-gravity bottle, or a hydro-meter, is used in this instance; but in the case or wine, which contains saccharine and other substances besides which contains saccharine and other substances besides the alcohol, which materially influence its density, recourse is obliged to be had either to distillation or to one of the following methods:—1. By determining the boiling-point of the liquid; 2, the amount of dista-tion it undergoes when its temperature is raised from 2004 a 2004. 60° to 212°; or 3. by evaporating half the liquid in the open air, and restoring it to its original bulk by adding water, the difference of specific gravity, taken become and after the evaporation, will indicate the amount of alcohol. None of these processes are absolutely cor-rect; if, therefore, perfect accuracy is required, regular chemical analyses must be performed. The following tables give the amount of alcohol in various

{ - 4	
Spirits.	Sherry(Amontillado) 20:05
	Claret 15:10
Hollands 57.60	Burgundy 14'57
Scotch Whisky 54:32	Champagna 19-61
Irish ditto 53.90	Hock 12:08
Rum 53.68	
	Orange 11:26
Wines.	Elder 6.79
Brandy 58-39	Cider 5.21 to 9.87
Raisin 25-12	Ale (Burton) 8:68
Marsula 25 09	
Sherry (Brown) 23:01	Stout 6.80
Port 22.96	Porter 4-20
Madeira 22-27	Small Beer 1.28

Proportions of Alcohol in Mixtures of different Specific Gravities.

100 parts		Spec. Grav.	
Alc.	Water.	at 60°	
100	0	0.796	Absolute Alcohol.
-75 50	25 60	0.856 0.917	
49 25	51 75	0.920*	
0	100	1.000	Water.

Proof spirit.—Spirit stronger or weaker is said to be above or below proof.

ALCORAN, or KORAN. (See KORAN.)
ALCORNOQUE BARE, all-kor-noke, several kinds of astringent bark imported into this country for the use of the tanner are thus named. The American alcornoque bark is the produce of a species of Boudichia and o. the species of Byronium; the European is although from the north of the cort ask. obtained from the younger branches of the cork-oak, Quercus Suber

ALCOVE, all-kove (Arab. eleast, a sleeping-chamber), in Arch., atterm applied to a recess in a chamber where a bed is or can be placed. In countries where beds are not commonly made in such recesses, it may be used to describe any recess in any sort or apartment.

ALCYONIDE, dissection of the ireal-water polyzon, or assistant zoopitytes. (See ANTHOZOM, CORALS, POLYPES, SPONGES.)

ALDEBARAN, al-de-ba'-ran, in Astron., a name given

by the Arab to a bright star of the first magnitude, situate in the southern eye of the constellation Tarrus.

ALDEHYDE, ül'-de-kide.—When alcohol is submitted to any process by which hydrogen is extracted from it (deoxidation, for instance), it becomes an eldehydrogen alcohol-king it and a submitted as submitted as a submitted as submit medicine.

ALCOHOLOMETER. (See ALCOHOLOMETEX.)

ALCOMETEX, id-loof-mestre, with a peculiar and characteristic odour. Its density (Arab. alcohol, and Gr. metron, a measure), is the art of determining the proportion of alcohol contained in any liquid. As the commercial and excisable value of into acctic acid. These reactions are as follows:

### Alder

 $C_AH_AO_a - H_a = C_AH_AO_a$ (Alcohol) (Aldehyde)  $C_AH_AO_a + O_a = C_AH_AO_a$ (Aldehyde) (Hydrated acetic acid)

(See ALNUS.) ALDER.

ALDER. (See ALEVOS.)

ALDERMAN, cavil-der-midn, a term derived from the con\_narative degree of the Ang.-Sax word eald, old, and man. Earls, governors of provinces, and other persons of distinction, were generally termed aldermen by the Anglo-Saxons. The title is now applied to certain magistrates or officers in municipal corporations. By 5 & 6 Will. IV. c. 76, the resident burgesses also corrections when from their new number obscess less corrections. elect councillors, who, from their own number, choose a certain number of aldermen, who hold office for six years, one half going out every three years. One fourth of the municipal council consists of aldermen, and three fourths of councillors. In the corporation of London, which was not affected by the above act, there are twenty-six aldermen, including the lord-mayor, twenty-five of whom are already for the conmayor, twenty-five of whom are elected for life by such freemen as are householders in the twenty-five wards. The twenty-sixth alderman, who belongs to the dependency of Southwark, is appointed by the other aldermen, who generally, when a vacancy occurs, select the senior from among themselves, and a new alderman is elected for the ward for which he sat.

ALTURE EDITIONS, dV-dine, in Bibliography, a term applied to those editions of celebrated authors which came from the press of the family of Aldus Manutius. In 1490, the first of that name established his printing-press at Venice, and posterity is indebted to him for many of the first editions of Greek authors, and other valuable works. In his edition of Virgil, of 1501, the italic characters used in Roman printing first appear; and from that date, a number of classical works, in both the Greek and Latin tongues, were produced from his press in a duodecimo form. These produced from his press in a duodecimo form. These are what is generally understood as the Aldine Editions. are what is generally understood as the Aldine Editions. In 1597, after producing 908 editions, the family press was said to have been broken up; but several Venetian publications, bearing the imprint of the Aldine family. an anchor and a dolphin engraved on the last page, and which appeared early in the 17th century, would seem to contradict the report. For a short time a branch of the Aldine Press was established in Rome. The term has been applied to well-printed books.

All, 41 (Sax. eds., cale, or aloth), the name for-

term has been applied to well-printed books.

ALB, oil (Bax. eala, eale, or aloth), the name formerly given to unhopped matt-liquor, but now applied
to every strong and comparatively light-coloured beer.
The hop was brought into this country from the Netherlands, in the reign of Henry VIII., and the word
beer, from the German bier, was then employed to
distinguish the hopped liquor from the more ancient
haverage. The conversion between hops and the word beverage. The connection between hops and the word beer is indicated by the old couplet:—

"Hops, reformation, bays, and beer,
Came into England all in one year."
Again, Parkinson, in 1640, writes:—"The ale which
our forefathers were accustomed only to drink, being a kind of thicker drink than beer, is now almost quite left off to be made, the use of hops to be nut therein altering the quality thereof, to be much more healthful altering the quality thereof, to be much more neathful or rather physical, to preserve the body from the repletion of gross humours which the ale engendereth." Ale made from mat alone was a favourite beverage of the ancient Germans even in the time of Tacitus. It was, moreover, highly esteemed by the Danes and Anglo-Saxons, being even thought worthy of slaking the thirst of the mighty heroes in the Hall of Odin. It is expressly named as one of the liquors provided for a banquet given by Edward the Confessor. Isidorus and a banquet giver by Edward the Confessor. Isidorus and Orosius state that the ancient Britons and other Celtic nations drank ale, which they made by a process very similar to our modern brewing. They inform us that the grain was firststeeped in water and made to germinate; it was then dried and ground; after which it was infused in a certain quantity of water, and the whole fermented. Ale was formerly regarded in England as an absolute necessary of life, and various ordinances or samises have been passed for regulating its price and an account necessary of life, and various ordinances or sensizes have been passed for regulating its price and quality. Thus, in 1251, during the reign of Henry III., an assize of bread and ale was struck, which settled the price of the latter article as follows:—"A brewer may sell two gallons of ale for a penny in cities, and three or four gallons for the same price in the country."

#### Alehouses

The penny of that time was worth about threepence of of our currency. Some centuries since, ale took the place of our tea or coffee at breakfast. The earl of Northumberkand, in the reign of Henry VIII., lived in the following manner:—"On fiesh-days throughout the year, breakfast for my lord and lady was a loaf of bread, two manchets, & quart of beer, a quart of wine, half a chine of mutton, or a chine of beef, boiled." The same allowance of beer was included in the bill of fare for meagre days, when salt fish and buttered eggs were substituted for beef or mutton. Ale, as now distinguished from porter and small beer, is prepared from pale malt, and, except in the case of bitter ale, a comparatively small proportion of hops. Strong ale is made from the best malt and the fluest kinds of kops, such as the goldings and white-bines of Kent and Surrey, or the mild-flavoured flowers of Worcestershire. The fermentation is allowed to proceed slowly until the yeast is exhausted, and perfectly separated. The Scotch alea are remarkable for the very small quantity of hops which they contain. Burton ale is a very strong and wine-like product, which is highly esteemed. The bitter alee of Bass and Allsopp only differ from this chiefly in having a larger quantity of hops, which imparts a pleasant bitter, and ronders them less prone to turn in hot climates. Strong ales contain from 5½ to 10 per cent., by weight, of alcohol.—Ref. Johnston's Chemistry of Common Life. (See Brewing, Hors, Maler.) The penny of that time was worth about threepence of of our currency. Some centuries since, ale took the place of our tes or coffee at breakfast. The earl of HOPS, MALT.)

ALE-CONNER, kon'-ner, alc-kenner, or one who kens or knows what good ale is. The office is of great antiquity. Ale-conners and ale-tasters were chosen every year in the court-leet of each manor. Similar officers were appointed in towns and boroughs. In the city of Lon-don there are four ale-conners, who are appointed by the liverymen in common-hall on Midsummer-day.

ALECTEYOMANCY, a-lek'-tri-o-man'-se (Gr. alektryon, a cock, manteia, divination), among the ancients, a mode of divination by means of cocks. It was performed by writing the twenty-four letters of the alphabet in the writing the twenty-lour letters of the alphabet in the dust, upon each of which a grain of corn was laid. A cock was then let loose among the letters, and those out of which the bird picked the corn being joined together, were supposed to disclose what was required to be known. In this manner Jamblichus, the master of Proclus, is said to have divined that a person named of Fronts, is sain to have under the person hamed Theodosius, Theodotus, or Theodorus, would succeed the emperor Valens, who, upon hearing of the matter, put to death several persons whose names began with those letters, and obliged Jamblichus to seek a volun-

those letters, and obliged Jamblichus to seek a voluntary death by poison, in order to escape his resentment.

ALEE, a-le', (Ang.-Sax.), in Mar., the term used when the wind, blowing across the line of a ship's course, makes the sails and masts incline to what is then called the lee-side, or to leeward. It also means the situation of the helm when pushed close down to the lee-side of the ship, in order to put the ship about, or to lay her head to windward.

ANYOUNDER (II. NOWLERS (Sax. calls or cale, ale and

ALEMOUSES, ail-houses (Sax. eala or eale, ale, and hus, house), houses in which ale and beer are sold. As early as the year 1496 the inconveniences arising from the assemblage of numbers of riotous persons, and of the excessive drinking in alchouses, became so great as to make them the subject of legis-lation. In the second year of the reign of Henry VII. an act was passed against "vacabounds and beggers," empowering two justices of the peace "to reject and put away comen ale-selling in tounes and places where they shall convenyent (convene), and to take suretie of the keepers of alchouses of their gode behaving by the discretion of the seid justices, and in the same to be avyed and aggreed at the tyme of their sessions." The 5 & 6 of Edw. VI. c. 25, gave to magistrates the power of forbidding the selling of beer and ale at such alchouses, and it was enacted "none should be sufalchouses, and it was enacted "none should be suf-fered to keep slehouses unless publicly allowed at the sessions, or by two justices." This statute, which was the first act of the legislature that placed alchouses under the control of local magistrates, formed the commencement of the system of licenses. An act was passed in 1694, 2 Jac. I. c. b, to restrain the "inordinate haunting and tippling in inns, alchouses, and other victualling-houses." Other statutes were enacted in the reign of James, one of which imposed a penalty on each person convicted of tippling in

### Alembic

an alchouse, of 3s. 4d. for each offence, and, in default of payment, punishment in the stocks for four hours. Other alterations were made in the 7 Jac. I. c. 10, the 21 Jac. I. c. 7, the 1 Csr. I. c. 4, the 3 Csr. I. c. 3, the 21 Jac. 1. c. 7, the 1 Usr. 1. c. 2, the 3 Usr. 1. c. 3, and, in 1654, during the Commonwealth, it was ordered, at the London sessions, that no new licenses should be granted for two years. After the Restoration, in 1682, it was ordered, that no license should in future be granted to alchouse-keepers who frequented conventicles. In Locke's second Letter on Toleration he alludes to their having been driven to take the sacrament for the sake of obtaining licenses to sell ale. In 1729 the sale of spirituous liquors had to me so common that an act was passed, 2 Geo. II. c. 28, enacting that no license should in future be granted but at a general meeting of the magistrates acting in the division as which the applicant dwells. This provision was evaded by men hawking spirits about the streets in wheelbarrows, and exposing them for sale on bulks, sheds, and stalls; and in 1753 a statute was passed, by the provisions of which, with some trifing amendments, the licensing of alchouses continued to be regulated for the remainder of that century. By a statute passed in 1808, 48 Geo. III. c. 143, a difference was introduced 1808, 48 Geo. III. c. 143, a difference was introduced into the mode of licensing, for purposes connected with the collection of the revenue. In 1828 a general act was passed (9 Geo. IV. c. 61), which repealed all former statutes on this subject. Since then various regulations have been made, of which the following are the most recent and important. By the 3 & 4 Vict. c. 61, a license can only be granted to the real occupier of the house in which the beer or cider is to be retailed, and every person amylying for a license must produce cartificate. person applying for a license must produce a certificate from the overseer of his being the real occupier of the from the overseer of his being the real occupier of the house. Licensed victualiers and keepers of beershops who sell ale to be drunk on the premises, are liable to have soldiers billeted upon them. The 11 & 12 Vict. c. 49, and the 18 & 19 Vict. c. 118, regulate the sale of beer and other liquors on Sunday, Christmas-day, and Good Friday.

Good Friday.

ALEMBIO, a-lem'-bik (Arab., al, the, umbeeq, corrupted from the Greek word ambix—a cup or vase), a vessel formerly employed for distilling, that is to say, for separating volatile liquids from substances less volatile. (See DISTILLATION.) The alembic is one of the most ancient instruments of chemical research, and may be regarded as the type of all distillatory apparatus. In its original form, it is seldom used in the ratus. In its original norm, it is seldom used in the modern laboratory; but it must be confessed that it was admirably adapted to the processes in vogue among the alchemiste, by whom it was chiefly used. It consisted of two portions, capable of being separated; the lower—known as the body, cucurbit, bolthead, belly, or chamber,—was a gourd-shaped vessel (whence the name "cucurbit," Lat. cucurbita, gourd), well fitted for being cleansed, or to have materials introduced. The head, or capital, was also singularly perfect in shape for the intended uses; it had a kind of channel all round to convey the liquid condensed in it to the beak, which was connected with the receiver. to the beak, which was connected with the receiver. Several modifications of the alembic are used in the

chemical arts.

chemical arts.

ALEMDROTH, SAL, a-lem'-brawth, a famous preparation of the alchemists, now known to be a double chloride of mercury and ammonium, having the composition expressed by the formula HgCl+NH, Cl+HO.

ALEURITES, àl-u'-ri-tees, in Bot., a genus of dicotyledonous plants, belonging to the order Euphorbiaces, The most interesting species is A. tribaba, the candlenut tree, the seeds of which contain the oil called kukiu, or kekune, which is used in some parts of the world for illuminating purposes, and which has been recommended as a substitute for castor-oil in medicine.

ALEXANDERS, dl-ex-an'-ders, a name given to an escu lent umbelliferous plant, Smyrnium olusatrum, which

lent umbelliferous plant. Smyrnium of usatrum, which was formerly cultivated like oelery.

ALEXATDELAN LIBEARY.—This was, probably, the largest library that had existed before the invention of printing. It was founded at Alexandria, about 284 B.O., by Ptolemy Boter, at the suggestion of Demetrius Phalerius, who had seen the public libraries at Athena. Agents were employed in different parts of Asia and Greece to seek out and purchase the rurest and most valuable works; so that, at length the

# Alexandrine Verse

Alexandrian library is said to have comprised 700,000 volumes. At first, the books were contained in the museum in the Brucheion quarter of the city; but, when they amounted to 400,000 volumes, a new library. was formed, within the Serapeum, or temple of Serapis, where, at length, 300,000 were collected. During the plunder of the city, after its capture by Julius Casar, the old library was accidentally destroyed Julius Cæssar, the old library was accidentally destroyed by fire. That in the Serapeum, however, still remained, and was subsequently largely augmented, particularly by the Pergamean collection, amounting to 200,000 volumes, presented by Mark Autony to Cleopatra, till it at length surpassed the former in the number and value of its contents. When the temple of Serapis was destroyed, in A.D. 390, by Theophilus, patriarch of Alexandria, under Theodosius the Great, a great part of the library was destroyed or lost; but it was not till the taking of Alexandria by the Barait was not till the taking of Alexandria by the Saracens, in 642, that it was utterly destroyed. It is said that when Amrou, the victorious general, applied to the caliph Omar for instructions regarding the library, he was answered,—" If these writings of the Greeks agree with the Koran, or Book of God, they are useless, and need not be preserved; if they disagree, they are pernicious, and ought to be destroyed." Accordingly it is said the works were sembyed to her cordingly, it is said, the works were employed to heat the 4,000 baths of the city; and such was their number, that they lasted for six months.

ALEXANDRIAN MANUSCRIPT, ALEXANDRIAN MANUSCRIPT, Codes Alexandrinus, the name of a Greek manuscript of the Old and New Testaments, now in the British Museum. It was sent as a present to Charles I., from, Cyrillus Lucaris, partirarch of Constantinople, by Sir Thomas Rowe, ambassador from England to the Porte. It is contained in four volumes quarto, of which the New Testament cocupies the last, and is written on veilum, in double columns. The New Testament is, however, less perfect than the Old. It contains all the expensed and most columns. The New Testament is, however, less perfect than the Old. It contains all the canonical and most of the apocryphal books, with several others. Critics are much divided as to the date of this work; but it seems most probable that it was written about the 6th century. A fac-simile of the New Testament was published by Dr. Wolde, in 1786, and more recently one of the Old Testament has been published by the Rev. H. Baber.

ALEXABURIAN SCHOOL.—When ancient Greece lost her glory and independence, literature and science found a refuge in Alexandria, under the munificent patronage of the Ptolemies. Ptolemy Soter, or his successor Ptolemy Philadelphus, established at Alexandria a Museum, whither learned men were invited from all parts, and maintained at the public expense, with every facility for cultivating the various branches of literature and science. At first it was principally distinguished as a school of grammar and criticism, producing correct editions of the ancients, and writing learned commentaries upon them. In poetry, the ALEXANDRIAN SCHOOL .- When ancient Greece lost producing correct editions of the ancients, and writing learned commentaries upon them. In poetry, the writers of this school are distinguished for correctness, purity, and elegance of style; but the more important part, the spirit and genius which characterized the earlier poetry of the Greeks, is almost entirely wanting. In philosophy, the Alexandrian school was a species of eelecticism, being an attempt to blend the systems of the East and West,—to unite the religious opinions of the East with the Greek dialectics. (See Nearly Conveyers ). In the mathematical and whesterl NEOPLATONISTS.) In the mathematical and physical ADDITIONISTS.) In the mathematical and physical sciences this school became very distinguished, having such men as Euclid, Apollonius, Eratosthenes, and Ptolemeus, the geographer. Alexandria continued to be distinguished as a seat of learning until its capture by the Saracens.

ALEXANDRINE VERSE, a species of verse, so called from its being first used in an old French poem on Alexander the Great, belonging to about the 12th century. Ronsard, however, was the first to render it popular, and it is now the regular heroic verse of the French. It consists of twelve syllables, broken into two regular hemistichs, i.e. every sixth syllable ter-ninating a word. In English, the Alexandrine verse is rarely used throughout a whole poem, and the rule of dividing into hemistichs is occasionally violated.

The second of the following lines is an Alexandrine:—

A needless Alexandrine ends the song, Which, like a wounded snake, drags its slow length along."

Argm, dl'.jee (Lat., seaweeds), in Bot., this great class of Thallogens (see this word) comprehends the sea-weeds and the multifarious green vegetable forms of simple cellular structure met with in fresh water and in permanently damp situations. The lumblest members of the vegetable kingdom belong to this class. Aigo are flowerless, and consequently seedless. They are propagated in various ways by reproductive parti-cles, called spores or sporules. The class comprehends cles, called spores or sporules. The class comprehends a vast variety of plants, exhibiting a wonderful multiplicity of forms, colours, sizes, and degrees of complexity in structure. These plants have, however, been arranged into three groups or orders, which have estain striking distinctive characters. These three orders are named \*\*Ehodosporea\*\*, or \*\*Floridea\*\*; \*\*Melicians\*\*, or \*\*red-spored alge\*\*, grow in salt water, and are generally rose-red or purple, rarely brown-red or greensht-red. \*\*Melanosporea\*\*, or dark-spored alga\*\*, are marine plants of an olive-green or brown colour. \*\*Chlorosporea\*\*, or green-spored alga\*\*, are generally green, rarely red or livid purple, found sometimes in sea-water, but more frequently in fresh-water ponds, streams, and ditches, and on damp surfaces. Professor streams, and ditches, and on damp surfaces. Professor series, and citones, and on damp surfaces. Professor Bentley roughly estimates the number of species of signs at 2,500. Many are used for food in different parts of the world, their nutritious properties being due to he presence of starch, mannite, muchage, albumen, and gelose. The ashes of several kinds of sea-weeds form kelp, formerly extensively used for the preparation of carbonate of soda. Iodine is obtained from sea-weeds. None of the plants in this great class are known to be poisonous.

ALGAROBA, or ALGAROBILLA, al-ga-ro-bil'-la, the legumes of a species of mimosa used in the process

ALGAROTH, POWDER OF, M-ga-roth, a mixture of the terchloride and teroxide of untimony invented by Victor Algarotti, a Venetian chemist, formerly much used in medicine.

ALGEBRA, al'-je-bra (Arab. al djaber, i.e. science of restitutions), the science of numbers considered generally. Arithmetic treats of the facts connected with figures, algebra of the laws that govern them; for instance, that 5 multiplied by 4 gives the same product as 4 multiplied by 5, is but an arithmetical fact;

duct as 4 multiplied by 5, is but an arithmetical lact; but to establish as general principle that the product of any two numbers whatever is the same, no matter in what order they be multiplied, is an algebraical proposition. In algebra, numbers are represented by letters. It is a method of performing calculations of all sorts of quantities by means of general signs or characters.

Known quantities are generally represented by the first letters of the alphabet, as, a, b, c, &c. Unknown,

by the last; as, x, y, z. The sign + (plus or more) is the mark of addition. Thus, a + b means that the quantities represented by a and b are to be added together. When no sign is prefixed, + is understood.

The sign — (minus or less) denotes subtraction; as, a-b, that is, the number represented by b is to be subtracted from that represented by a.

Quantities with the sign + prefixed are called posi-tive or affirmative; and those with the sign - negative quantities.

The sign  $\times$  (or multiplied by) denotes multiplication; as,  $5 \times 4$  means that 5 is to be multiplied by 4.

is the mark of division; thus,  $a \div b$  means that a is divided by b.

A number prefixed to a letter is called a numeral pefficient. When no number is expressed, I is under-

coefficient. With no number is expressed, I is understood; i.e., I is the numeral co-efficient of such letter.

A simple quantity consists of one purt or term, as

# a, --de; a compound quantity of more than one, connected by the signs + or -; as, a + b, a - b + c, are compound quantities. If there are two terms, it is called a binominal, if three, a trinominal, &c.

Like quantities consist of the same letters repeated;

thus + ab, - bab, are like quantities; but + ab, and + ab are unlike quantities.

The powers of algebraic quantities are expressed by placing a small figure (equivalent to the number of factors, and called the index or exponent of the power) at the right-hand side of the letter. Thus axa, or the

square of a, is expressed by  $a^3$ ;  $b \times b \times b$ , or the cube of b, is expressed by  $b^3$ ;  $x \times x \times x \times x$ , or the fourth power of x, is expressed by  $x^{a}$ ;  $a + b \times a + b \times a + b$ , or the cube of a + b, is expressed by  $a + b|^3$ , and so on.

The roots of quantities are expressed by the sign  $\checkmark$ .

with the proper index annexed: thus;  $^2\sqrt{a}$ , or  $\sqrt{a}$  expresses the square root of a;  $^3\sqrt{b}$ , the cube root of b;  $\sqrt{u+x}$ , expresses the biquadrate root of a+x, &c.

The sign = placed between two or more quantities, expresses the equality of such quantities; thus, a + bexpresses the equation of such quantities; when x = c + d, means that a + b is equal to c + d; and ax + by = cx + dy = 2x + fy, mean that the quantities ax + by, cx + dy, and ex + fy, are all equal to each other

other. In algebraical operations the word therefore, or coasequently, often occurs. To express this word the symbol  $\cdot$  is commonly used; thus, the sentence, "therefore, a+b is equal to c+d," is expressed by  $\cdot$ . a+b=c

The symbol 7 placed between two unequal quantities signifies that the first is greater than the last; thus, a > b, intimates that a is greater than b; but when the character is inverted, it signifies that the first quantity character is the second: thus,  $a \ge b$ , intimates that a is

The operations of algebra are the same as those of arithmetic,—addition, subtraction multiplication, divi-sion, extraction of roots, &c. In its application to the resolution of problems, the problem must first be translated out of common into algebraic language, by ex-pressing all the conditions and quantities, both known pressing an ine conductors and quantities, our known, and unknown, by their proper characters, arranged in an equation (see EQUATIONS), or several equations, if necessary, and treating the unknown quantity as if it were a known one: this forms the composition. Then the resolution, or analytic part, is the disentangling the unknown quantity from the several others with which it is connected, so as to retain it on one side of the equation, while all the known quantities are collected on the other side. This process is called analysis or resolution; and hence algebra is a species of analytic art. The mode of applying algebra to the resolution of problems may be seen in the following example:—From the given sum and difference of two numbers, to find the numbers themselves. Let x and y be the numbers, and a and b their sum and difference respectively:-

$$\begin{array}{l} x+y=a \text{ and } \\ x-y=b \end{array}$$

Adding the quantities on both sides of the symbol=. we have-

$$2x = a + b$$
$$x = \frac{a+b}{2}$$

Again, subtracting the quantities on both sides of the symbol -, we have-

$$2y = a - b \text{ and }$$

$$y = \frac{a - b}{2}$$

and hence arises the general algebraical trath, that the greater and less of two numbers are respectively equal to half their sum and half their difference. For particular cases, we have only to substitute the respective numbers instead of a and b, in order to have immediately the corresponding values of x and y. The origin of algebra cannot be determined with exactitude. In the middle of the 4th century, when the mathematical sciences were declining, Diophantus wrote a treatise on arithmetic, in thirteen books, of which seven only remain ton. Hypatia, the daughter of Theon, who fell a victim to the fury of a mob, in the early part of the 5th century, wrote a commentary on the work of Diophantus: this, however, is also lost. In the 16th century, the works of Diophantus were And hence arises the general algebraical truth, that the on the work of Diophantus: this, however, is also lost. In the 16th century, the works of Diophantus were discovered in the Vatioan library at Rome. They were written in the Greek language, and were translated into Latin by Xylander, in 1875. A more complete translation, by Bachet de Mezeriac, appeared in 1821. In 1870, the French mathematician Fermot published notes of his own on the writings of Diophantus. The important invention of algebra, as well as numeral characters and decimal arithmetic, was first made

known in Europe by the Arabians, who had col-lected the works of the Greek mathematicians, and translated them. By means of the Arabic tongue, Euchid was first introduced into Western Europe. The Arabians award the invention of algebrate their famous mathematician Mahommed-Ben-Musa, or Moses, who was also called Mahommed of Buziana, in the 9th century, a copy of whose treatist on the subject is preserved in the Rodleian library at Oxford. The science of algebra was originally introduced into Italy by Leonardo, a merchant of Pisa, who had spent his youth in Barbary, and there become acquainted with the Indian method of computing by nine numeral characters. He composed a treatise on Arithmetic in 1202, which he afterwards revised in £223, two centuries before the invention of printing. The manuscript was discovered in the middle of last century, in the Magliabecchian library at Florence. The first book on algebra that ever was printed was written by Arabians award the invention of algebrato their famous in the highlancechian intrary at Forence. The area book on algebra that ever was printed was written by Lucas Paciolus, or Lucas de Borgo, a Minorite friar. It appeared in 1494 and again in 1523. It is called "Summa de Arithmetica, Geometria, Proportione, et Proportionalita." Not only are we indebted to Italy for the first European knowledge of algebra, but it was there that it received its earliest improvements at the hands of Scipio Ferreus, Florido, Tartalea of Brescia Cardan, Lewis Ferrari, and Bombelli. Stifelius and Schenbelius, two German mathematicians, were con-temporary with Cardan and Tartalea. Stifelius introduced the characters which denote addition and subtraction, and the symbol for the square root. first treatise on algebra, in English, was from the pen of Robert Recorde, a mathematician and phy-sician of Cambridge. Vieta was the first who intro-duced general symbols, applicable to all problems of the same kind, without the labour of repeating the the same kmd, without the labour of repeating the same process of analysis for each; thus happily applying algebra to geometry.—Ref. Bonnyeastle's translation of Bossut's Historice des Mathématiques; the Historics of Montucla, Corsali, and Libri; and Hutton's Mathematical Tructs.

ALGORITHM, all-go-rithm, derived from the Arabic, the root being a word which means or refers to calculation or reckoning. Among many authors, and especially the Spanish, the word is naturalized, as meaning the science of numbers, or system of notation: thus, there is an significant of the differential calculus, an algorithm of function, &c. Though sometimes used by English writers, our language does not need it, the

word notation being an exact equivalent.

ALGUACII, al-gwa'-zeel, in Spain, is the general name of officers for the apprehension of criminals. The alguacil-mayor is a higher officer, with similar

functions.

Almadi, il-hai'-gi, in Bot., Camel's-thorn, a gen. of leguminous plants in the sub-ord. Papilionaece. The species A. macroma, a native of Persis, yields a kind of manna, which is used as food for cattle. The manna is obtained by shaking the branches of the

trae. ALHAMBRA, W-ham'-bra (a corruption of ARRAMBIA, dl.ham'-bra (a corruption or the Arab. kalat al-hamra, the red castle), the name of a celebrated fortress, which formed the acropolis, or citadel, of the city of Granada, and in which was situate the palace of the ancient Moorish kings of Granada. It was fortified in the strongest manner, and was causable of containing 40.000 man. The Grandas. It was fortined in the strongest meaner, and was capable of containing 40,000 men. The emperor Charles V. also commenced erecting a palace within its walls, but it was never finished. The fortress is surrounded by noble woods and delicious gardens; the wall which encompasses it being more than a mile in circuit. The magnificent Moorish palace inside the wall was commenced by Ibnu-l-almer, in 1248, and continued to receive additions during the next hundred years. Portions of this building still remain, and dred years. Portions of this building still remain, and are at the present day called by the Spaniards the Casa Real. The Court of the Lions is the grand apartment of the palace; it is so termed from a splendid fountain, supported by lions, entirely built of marble and alabaster, and ornamented with the most graceful fretwork and arabesques. The court is 100 feet long, by 50 broad, and has 128 columns of white marble. The windows are chiefly towards the interior, the Arabian accidence for this rior, the Arabian architect giving his reasons for this peculiarity of construction in an inscription reading

thus:—"My windows admit the light and evaluate the view of external objects, lest the beauties of Metare should divert your attention from the beauties of my work." Over the walls, ornaments are profusely scattered, in colours of gold, pink, light blue, such dusky purple. Although no longer inhabited, this beautiful example of medieval architecture is preserved as a work of art, and is placed under the obserge of a governor and a number of invalid soldiers. Some of its beauties have been reproduced in the "Albambra Court" of the Crystal Falsce at Sydenhambra Court" of the Crystal Falsce at Sydenhambra (works of Washington Irving for its history, and Owen Jones's Albambra for a complete description of its ornamentation and architecture.

Albambraic, al-kam-brai-ik, a term given to a par-

ALHAMBRAIC, al-ham'-brai-ik, a term given to a particular style of ornamental art, which is founded upon the decoration of the celebrated Moorish palace of the Albambra, at Granada (see ALHAMBRA). In this style all imitations of men and animals are omitted, while the floral and vegetable forms employed bear only a distant resemblance to nature. Rich metallic elabora-tion and gorgeous colouring are the chief character-istics of the Albambraic style; but, so exquisite was the taste of the Moorish artists who invented it, that

it was always harmonious.

ALIAS (Lat., otherwise), a word used to denote a name or title that has been assumed by, or accidentally given to, a person; as, Thomas, alias Jones. An alias may be assumed by any one, but does not absolve him from the responsibility of an act committed under his assumed name. It is also a second writ issued from the courts at Westminster, where the first has been issued, and returned without effect.

ALIBI, "il'-i-bi (Lat., elsewhere, in another manner), in Law, is a term used to express that defense in a criminal prosecution, where the party accused, in order to prove that he could not have committed the crime charged upon him, offers evidence that he was in a different place at the time of its commission.

ALIEN, ai'-li-en (Lat. alienus, another man's, of another country), generally speaking, is one born in a foreign country, out of the allegiance of the king or other executive of that in which he is for the time resident or staying. In order to ascertain the nature of an alien, it will be better to consider who are natural-born English subjects. They are persons born within the allegiance, power, or protection of the erown of England, which terms embrace not only persons born within the dominions of her majesty or of her homagers, and the children of subjects in her service abroad, and the queen's children and heirs of the crown, all of whom are natural-born subjects by the common law, but also under various estatutes, all persons, though born abroad, whose fathers or gradfathers by the father's side were natural-born subjects at common law, unless the father or paternal grandat common law, unless the father or paternal grand-father through whom the claim is made was, at the time of the birth of such children, liable, in case of his return into this country, to the ponalties of treason or felony, or was in the service of any foreign prince then at cumity with the crown of England, excepting always from the benefit both of the common law and the statutes those artificers and manufacturers who are declared aliens by 5 Geo. I. c. 27. Artificers, however, may now go abroad (5 Geo. IV. c. 27). Persons born in transmarine territories belonging to the queen of England in any other right than that of the English crown (as formerly the Hanoverians), and persons doing service to the queen as officers of transmarine territories, are not natural-born subjects. A child born out of the allegiance of the crown of England is not entitled to be deemed a natural-born subject, unless the father be, at the time of the birth subject, unless the father be, at the time of the birth of the child, not a subject only, but a subject by birth. An alien born could not, till lately, hold anything except a lease of his house. But now, by 7 & 8 Vict. c. 66, s. 3, every person born out of her majesty's dominions, of a mother being a natural-born subject, is capable of taking and holding any property, and by sec. 5, every alien residing in any part of the United Kingdom, and being the subject of a friendly state, may take and hold any lands or tenements for the currence of residues or coursetion by him or his the purpose of residence or occupation by him or his servants, or for business purposes, for a term not exceeding twenty-one years. A liceuse to purchase,

take, or hold property may, however, be obtained from the crown. An alien cannot sit in parliament or privy council, nor hold grants or offices of trust under the crown, nor act as a juryman, except in cases where an alien is to be tried, who is entitled to have a jury composed of half Englishmen and half foreigners. An alien enemy is the subject of another state at actual war with our own, and does not possess even the bare right of residence, or the power of enforcing any contract or suing for any debt due to him. But where a foreigner is resident in England, and afterwards a war breaks out between his country and ours, his goods are not fable to be seized; and if a contract be made with him during peace, the right of action is not absolutely forfeited by the occurrence of a war, though it is suspended. As to the removal of disabilities

though it is suspended. As to the removal of disabilities of alien friends, see DERIZATION, NATURALIZATION, ALIENATION, ai-li-e-nai'-shun (Lat. alienatio, alieno, I alienate, pass away, discard), in Law, any method whereby estates are voluntarily resigned by one man and accepted by another, whether it be by sale, gift, marriage settlement, devise, or other transmission of property, by the mutual consent of the parties. All persons are prima facic capable both of conveying and purchasing, unless the law has laid them under any particular disabilities. Ecclesiastical persons are enabled, for particular purposes, and subject to certain conditions, and by consent of proper parties, to make conditions, and by consent of proper parties, to make dispositions of their benefices. Such lay corporations as are called municipal (viz., corporated towns) may dis-pose of the corporation estates, with the approbation pose of the corporation estates, with the approbation of the lords of the Treasury, or any three of them, and on such terms as they may think fit to approve. Lay corporations aggregate, in general (subject to the restraint imposed on such as are municipal), have a right to alienate freely their lands of inheritance. Conveyances by idiots and insane persons, except during a lucid interval, are void, except feedlments, which are only voidable. Conveyances by infants are in general not void, but voidable, either by themselves in general not void, but voidable, either by themselves in their lifetime, or by their representatives after their death; but if confirmed by the infant on coming of age, cannot afterwards be impeached by his repreage, cannot atterwards be impeaced by his repre-sentative. Their disposition by will is, however, void altogether. Conveyances by persons under duress are voidable, and may be affirmed or avoided when the duress ceases. Conveyances of her estate by a married woman (except as far as regards her equitable interest in land astigld to her senerate use) are absolutely

woman (except as far as regards her equitable interest in land settled to her separate use) are absolutely void, unless made in such particular method as the law has specifically appointed for the purpose.

ALIMENTARY CANAL, or DUCT, āl-i-meni-ta-re (Lut. alimentum, nourishment, food), is the name given to that great canal or conduit in animal bodies through which the food passes from the mouth to the anus. It distinguishes animal from vegetable life, plants having no common receptacle for their food nor canal for carring off the excrements. In the human sub-

having no common receptacle for their food nor canal for carrying off the excrements. In the human subject, it comprises the pharyux, esophagus or gullet, stomach, and large and small intestines, being, in a full-grown individual, nearly forty feet in length.

ALTMENTS, W-i-ments (Lat. alimentum, from clo, I nourish), a term applied to those substances which, upon being taken into the stomach, are capable of affording nourishment to the body. Every aliment must be derived from either the animal or vegetable indoor as the expective of affording nourishment to affording nourishment to the body. Every aliment must be derived from either the animal or vegetable kingdom, as the capacity of affording nourishment to the animal system would appear to belong exclusively to organized matter, or that which has possessed life. Nevertheless, certain substances appertaining to the inorganic kingdom, although incapable of themselves to form an aliment, have yet the power, when taken in conjunction with aliments, of assisting in the process of mutrition. These inorganic substances are principally water, salt, lime, &c. Aliments have been distinguished into nine classes. The first, or Furinaceous class, includes barley, wheat, oats, rice, maize, potatoes, haricots, lentils, peas, &c. The second, or Musilaginous class, comprehends melons, cabbages, turnips, beet-root, carrots, asparagus, &c. The third, or Sweet class of aliments, includes dates, spricots, dried grapes, figs, the various sorts of sugars, &c. In the fourth, or Acidulous class, there are grapes, strawberries, raspherries, mulberries, pears, prunes, spples, cherries, oranges, gooseberries, &c. In the

fifth, or Fatty class, there are snimal fats, oils, butter, fifth, or Futty class, there are animal fats, oils, butter, cocos, nuts, walnuts, olives, sweet almonds, &c. The sixth, or Cassous class, includes the various sorts of milk, cheese, &c. In the seventh, or Gelatinous class, there are, several kinds of fish, the flesh of young animals, calf's-foot, &c. In the eighth, or Albuminous class, there are included brain, eggs, &c. The ninth, or Fibricous class, codiprehends the flesh and the blood of various animals. To these nine divisions a tenth may be added, comprehending the Condiments, as pepper, salt, mustard, vinerar, horseradish, &c. as pepper, salt, mustard, vinegar, horseradish, &c. Certain liquids, or *Dribks*, should also be reckoned among the aliments, as water of various kinds (springwater, well-water, river-water), the infusions of tea and coffee; the various kinds of fermented liquors, as oider, perry, beer, wine, &c.; the alcoholic liquors, as gin, whisky, brandy, &c. As a rule, aliments require to be prepared by cooking, so as to be made more agreeable to the palate, or more easy of digestion, but few aliments being used in an undressed or natural condition. Ref. Hooper's Levicon Medicum; Mrs. Beeton's Book of Household Management.

ALMONY, nl'-i-mun-e (Lat. alimonia, sustenance), in Law, is a provision made for the support of a wife pending a suit instituted by her or her hushand, either for a dissolution of marriage or a judicial separation. By the Divorce Act, 20 & 21 Vict. c. 85, s. 32, the Court on Divorce may order the hushand to secure to the wife a sum of marriage. Vict. c. 83, is. 32, the Court on Divorce may order the busband to secure to the wife a sum of money, in gross or by annual payments, for any term not exceeding her own life, as, having regard to her fortune, the ability of her husband, and the conduct of the parties, it shall deem reasonable, and to enforce this by deed. The court has also the power, pending the suit, to make interim orders for payment of money to the wife, by way of alimony or otherwise. If the suit be instituted by the bushand the court can assenged its decrease. tuted by the husband, the court can suspend its decree

until the provision be secured.

ALIQUANT PART, al'-i-kwant (Lat. aliquanta pars), in Arith, a number which cannot measure any other without some remainder. Thus, 5 is an aliquant part of 12; for twice 5 wants 2 of 12, and three times 5 exceeds 12 by 3. The exact reverse of aliquot.

ALIQUOT, \(\vec{d}t^2 - i k vot \) [Lat. aliquoties, how many times, a restrict the footbase of footbase which display no the north annual and the second footbase of footbase which display no the north annual and the second footbase of footbase and the second footbase of footbase and the second footbase of footbase of

a number or fraction which divides another number or a number of rection wind divides another number of fraction, without leaving a remainder. Thus, 6, 4, 8, 2, 1\frac{1}{2}, \frac{3}{2}, and \frac{1}{2}, are aliquot parts of 12, being contained in it 2, 3, 4, 6, 8, 28, and 96 times. At one time aliquot parts, expressed by vulgar fractions, were frequently used in arithrectic; but, now, the employment of decimals has, to a great extent, superseded their received. their use.

ALISMACKE, &i-is-mail-se-e, in Bot, au ord. of monocotyledonou. plants, in the sub-class Petaloidea. Swamp or noting plants, with parallel-veined leaves. Swamp or docting plants, with parallel-venued leaves, Their flowers are perfect, or very rarely uniexual. The perianth is inferior, that is to say, it does not adhere to the ovary, and is arranged in two whorls, each consisting of three parts; the outer whorl being green, the inner coloured. The stamens vary in number, and there are several ovaries. Plants belonging to this order are principally found in the northern parts of the world. The typical genus is Alisma, the waterplantain, some species of which are well adapted for accuration.

ALIZABINE, a-liz'-a-reen, the pure coleuring matter madder. Purpurin and garancine are also found in of madder. It this dye-stuff.

of mader. Aurylin and garanese are also found in this dye-stuff.

Alkahrer, & W-ka-kest, in Alch., a term applied to the long-sought-for universal solvent, or menstruum of the ancient chemists, touching which Kunkel asks,—"If it dissolve all substances, in what vessels can it be contained?" There is little doubt but that the alchemists had sufficient sense to ask the same simple question. Paracelsus, Van Helmont, and Glauber call sulphate of ammonia by this name, but they never pretended that it was universal solvent. The derivation of the word is, according to some, from the Arabic; according to others, from the German al, all, and geist, spirit.

ALKALI, & W-ko-H (Arab. al-kali, acds).—This term is applied, in Chem., to a class of substances characterized by the energy with which they combine with acids, by their acidity and caustic property, and by their sotion on vegetable colours. The ancient chemists

## Alkalimeter

included only three substances under this name,—vegetable alkali, or sods; mineral alkali, or potash; and volatile alkali, or ammonia. To these modern chemists add three alkalies proper—lithia, casis, and rubidia, and the alkaline earths—lime, strontia, baryts, magnesia, and a number of othefs too rare to need mention. With the exception of ammonia, these alkaline are all oxides of metals, called alkaline alkaline are all oxides of metals, called alkaline baryts, magnesia, and a number of others too rare to need mention. With the exception of ammonis, these sikalies are all oxides of metals, called alkaline and alkaline-earth metals. The pure form of these oxides is called the caustic state, from the burning properties possessed by them all when not combined with any soid. When they, are in combination with carbonic scid, which is a very weak acid, they are said to be in their mild form, and still preserve, in a minor degree, many of their characteristics as alkalies. Many vegetable substances, such as bark, opium, nightalase, and others, possess crystalline principles which, from behaving like alkalies, have been named alkaloids. Quinine, morphine, and atropine, are examples of these. Most of them form salts with acids; for instance, we have desulphate of quinine, accetate of morphine, and aco on. acetate of morphine, and so on.

ALKALIMETER, ül-ka-lim'-e-ter (Arab. al-kali, and Gr

metron, a measure). (See Alkalimeter.)
Alkalimetry, ăl-ka-lim'-e-fre, the art of determining

the proportion of caustic alkali, or alkaline carbonate, contained in commercial potash or sods, upon the amount of which depends their value for manufacturing purposes. The method by which this is effected, is by adding to a certain amount of the potash or soda dis-

adding to a certain amount of the potash or soda dis-solved in water, enough dilute sulphuric acid of definite strength to exactly neutralize the alkali, and noting this quantity. For instance, if it is found that one dram of the test acid will neutralize seven grains of pure alkali, it is evident that, if six drams are required to neutralize fifty grains of impure potash, there are only forty-two grains, or 84 per cent., of pure alkali in sample, the other 16 per cent. being combined with another acid, or replaced by some neutral compound.
ALKALINE EARTHS.—Baryta, stroutia, and lime are

so called to distinguish them from the earths proper. Their solutions are alkaline to test-paper, and their carbonates are insoluble in water; this latter fact dis-tinguishing them from the alkalies proper, magnesis, and alumina.

and alumins.

ALKALOIDS, VEGETABLE, &l'-ka-loids (Arab. al-kali, Gr. cidos, likeness).—The discovery of these substances is one of the most remarkable of modern chemistry. They are salidable bases, found in various vegetable substances, and are similar in their actions to the mineral alkalies mentioned above, uniting with acids to form salts. They are all violent poisons, highly nitrogenous, sparingly soluble in water, but more so in alcohol and dilute acids. They are prepared by boiling the substance containing them in dilute hydrochloric acid, neutralizing by a mineral alkali where the chloric acid, neutralizing by a mineral alkali where the alkaloid is precipitated in an insoluble form. The follakalond is precipitated in an insolution form. The for-lowing is a list of the principal vegetable alkaloids, and the substances from which they are derived. They are of the greatest value in medicine, the exhibi-tion of the fraction of a grain being attended with the most marked curative results. They are often found in books with the termination ine instead of ia, the latter being the more correct.

Morphia, from opium. Quinia Cinchonia from Peruvian bark. Strychnia, from nux vomica. Veratria, from hellebore. Atropia
Hyocyamia } from belladonna.
Nicotnia, from tobacco.
Accnita, from aconite.

ALEANET-Root, all-ka-net, a dye-stuff, giving a red colour, used for staining woods and for colouring oils and spirits used in perfumery. It is the root of the plant named by botanists Anchusa tinctoria.

ALKORAN. (See KORAN.)
ALLA, al'-la (Ital., in the), a term used adverbially ALLA, ac-ta (tast., in the), a term used advertinally it is sometimes the interior in Mus., in various ways; as, Alla or Al-antica, 'in giving a lively or interior the lold style,' as applied to compositions of a preceding age, no longer fashionable. Alla-breve, 'quick time,' wherein the notes take but half their general a term used in Mus. to d length; the noble fugue in the "Messiah," entitled quick as that of allegro.

# Allegretto

"And with his stripes we are healed," is written in this measure. Alla Capella, 'in the charch style.' Alla Zoppu, or Alzop, 'in an affected style.' Alla- or Al-loco, 'in its place,' a term which denotes, in violin music, that the hand, having been shifted, mustretura to its position. Alla- or Al-attavo, 'in the octave,' applied to voices or instruments where the parts lie, note for note on octave above or below. Alla-

applied to voices or instruments where the parts lis, note for note, an octave above or below. Alla- or Al-resersa, 'the reverse,' applied to parts in a contrary direction. Al-improvista, 'extemporaneous.'
Allah, all-la (Arab. al, the, and idah, deity), is the Arabic name of the Supreme Being, which, through the Koran, has been adopted by all nations that have embraced the Mohammedan faith.

embraced the Mohammedan faith.

ALLANTE, in Min. (See ORTHITE).

ALLA PRIMA, al'-la pre'-ma (Ital., all at once), in Paint., a term applied to that method of applying all the colours upon the canvas at once, without any retouching. Many of the finest works of the old masters were painted in at once in this way; but the method demands too much artistic skill, knowledge, and decision to be generally employed.—Ref. Hundertpfund's Art of Painting restored.

All Jerust A PROUSE All Leavest (Car. all attempts)

ALLECEET ARMOUR, all-le-oret (Ger., all-strength),

a convenient armour, much worn in the 16th century. It consisted of a casque, breastplate, and gussets, which sometimes reached to the middle of the thigh. and sometimes below t knees. The Swiss were the first infantry that cased themselves in steel; and so famous did they become, that the opinion respecting foot-soldiery underwent a total change, and the services of the Swiss infantry were eagerly sought by all the continental monarchs. In the paintings and prints of the period the Swiss soldiers are commonly depicted in this armour.

ALLEGIANCE, al-le'ad ligare, to bind to), is the natural, lawful, and faithful obedience which every subject owes to his prince. It is either per-petual, where one is a subject born, or has the right of a subject by naturalization, &c.; or it is temporary, by reason of residence



ALLECRET ARMOUB.

rary, by reason of residence in the state or country. To subjects born, it is an incident inseparable, and as soon as born, they owe, by birthright, obedience to their sovereign; and it cannot be confined to any kingdom, but follows the subject wherever he goes. The subjects are hence called kiegs people, and are bound by this allegiance to go with the king to his wars as well within as without the kingdom. dom. By the common law all persons above the age of twelve years were required to take the oaths of allegiance in courts-leet; and there are several sta-tutes requiring such oath to be taken on being ap-

pointed to certain offices, and otherwise.

Allegory, di-le-gor-s (Gr. allegoria, a parable), in Rhet., is the description of a subject, or the representation of a train of thought by means of another sentation of a train of thought by means of another subject having similar properties. Thus Menenius Agripps made use of an allegory when, in addressing his fellow-citizens at Rome, he described their rebellion under the figure of a conspiracy of the several members of the body against the stomach. Allegory has been a favourite mode of expression in all ages and countries, particularly among the Orientals; and it is sometimes the fittest or most available means of giving a lively or intelligible representation of certain

ALLEGRETTO, al-lai-gret'-to, the diminutive of allegro, a term used in Mus. to denote that the time is not so

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## Allegro

ALLEGRO, al-last-gro (Ital., merrily, sportively), in Mus., a term denoting the third degree of quickness. It is also used in combination with other terms; for example, allegro agliato, quick and agitated; allegro furios, vehemently quick; allegro assai, more quickly; allegro non molto, not very quickl; allegro deside, but not exvery quick; allegro ma non presto, quick, but not ex-

ALIMMANDE, al-le-mand' (Fr., German), a term applied to a dance supposed to be of German origin; whence the name. Formerly it was a slow dance; but at the present time it is understood to be moderately quick. By Handel and others of his contem-

poraries it was composed in four-crotchet time.

ALL-Fours, awl-fores, a game of cards, played usually by two persons, but sometimes by four, with a complete pack, and so named from the four chances therein, for each of which a point is scored, and which, joined in the hands of either of the party, are said to make all fours. The chances are,—high, the best trump out; low, the smallest trump dealt; Jack, the insre of trumps; game, the majority of pips reckoned from such of the following cards as the respective players may have in their tricks,—every ace counting lk king 3, queen 2, knave 1, and ten 10. Low is always scored by the person to whom it is dealt; but Jack, being the property of whoever can win or save it, the possessor is allowed to revoke and trump with that card, and, when turned up as trump, the dealer scores. It is also allowable for the player who lays down a high or low trump to inquire whether the same be high or low. After cutting for deal, six cards are given to each player, and the 13th turned up for trump. If the eldest does not like his cards, he may, for once in a game, say I beg, when the dealer must either give a point or three more cards to each, and turn up the 7th point or three more eards to each, and turn up the 7th for trump; but if that should prove of the same suit as the first turned up, then three more cards are to be given; and so on, till a different suit occurs. The cards are to be given; and so on, till a different suit occurs. The cards are the same below.

given; and so on, till a different suit occurs. The eards cank as at whist, and each player strives to secure his own tens and court cards, or to take those of his adversary. Ten or eleven points form the game.

ALLINGE, äl-li'-anse (Fr. alliance), in International Law and Pol., a league between two or more friendly powers. An alliance may be either offensive and defeasive or defensive only. Politicians divide them into three classes, those for which the allied states undartake to prosecute a war with their whole force; these in which the stripes of the second those in which auxiliary states furnish a principal state with a certain fixed contingent of men, arms, money, &c.; and those in which one power undertakes to furnish troops to another power for stated sub-

ALLIGATION, öl-li-gai'-shun (Lat. ad, and ligare, to bind together, or unite). A rule of Arith, by which the price of a mixture is found when the cost of the ingredients is known. This rule is divided into two cases,—alligation medial and alligation alternate. The cases,—alligation medial and alligation afternate. The following question would belong to alligation medial. Suppose 8 gallons of brandy, at 24s. per gallon, to be mixed with 12 gallons at 34s. per gallon, what would be the price of a gallon of the mixture? But if the question were reversed, and it were required how many gallons of brandy, at 34s. per gallon, must be mixed with 8 gallons at 24s. per gallon, to make the cost of the mixture 30s. per gallon, it would belong to alligation at the cost of the mixture 30s. per gallon, it would belong to alligation. atternate. Questions of this sort are most easily re-solved by the use of elementary algebra. Alligator. (See Choconile Family.) Alligator Toutouse. (See Tortoise.)

ALLITERATION, al-tit'-e-rai'-shun (Lat. ad, to, literu a letter), an ornament chiefly used in poetry, consisting of the repetition of the same letter at certain intervals; as,

"Apt alliteration's artful aid : "

An Austrian army, awfully array'd, Boldly, by battery, besieged Belgrade."

In Anglo-Saxon, Scandinavian, and old German poetry, alliteration served a purpose similar to that of rhyme In modern verse.

ALLEUM, all-li-um (Lat., garlie), in Bot., a gen. of lants belonging to the nat. ord. Liliacem, the Lily ribe. Many species are very familiar plants, being to take several allotropic forms,

# Allotropism

largely cultivated for the sake of their nutritious and piquant bulbs; such are Allium Cepa, the oniou; A. sativum, the garlic; A. Porrum, the lock; and A. accalonicum, the shalot. All the species are characterized by a girong, and, to most people, an extremely disagreeable odour. Allium ursinum, the common ramps of our meadows, diffuses its peculiar odour threath the six of the s through the air, and imparts its unpleasant flavour to the milk of the cows that feed upon it. The substance which gives the garlie and onion their pungent smell and flavour is a compound oil, called by chemists sulphide of allyle. (See ALVILE.) In England, the onion is used much more frequently than any other species. In France, the garlie is held in great esteem, and employed to flavor allowed transport of the second more than any other species. species. In France, the garite is neat in great esteem, and employed to flavour almost overy savoury disk. In Spain and Portugal, the two bulbs are employed rather as every-day articles of food than as more condiments; while the Arab, Moorish, and Ethiopian tribos are even greater devourers of garlic and onions than the inhabitants of the Peninsuls. Among the ancient Egyptians the onion formed an object of worship, and their median descendants assign it a place in their Egyptians the onion formed an object of worship, and their modern descendants assign it a place in their Paradise. The different species of Allium, when cultivated in warm climates, lose much of their pungency; hence the mild flavour of the Spanish onion. The builb of the common gaclic, Allium soticum, though rarely used by the medical practitioner; is known to have properties which might render it a valuable agent in the treatment of some diseases. When taken infermally, it is tonic stipulant expectorant and directions. nally, it is tonic, stimulant, expectorant, and diuretic. Externally it acts as a local irritant and resolvent, and is employed as an antispasmodic limiment for infantile convulsions.

ALLOCATION, öl-lo-kai'-shun (Lat. allocatio), admit-ting an article of account, especially in the Exchequer.

It is, more properly, a placing or adding to a thing.

ALLOCATUR, ill-lo-kai'-lar (Lat., it is allowed), in
Law, a practical term applied to the certificate of
allowance of costs, by the master of the court, on taxation.

ALLOCHROITE, al-lok'-ro-ite, in Min., a variety of

Allocinoitis, actor-ro-ue, in lain, a variety of garnet. (See Garnet.)

Allocition, al-lo-ku'-shun (Lat. al, for ad, to, and locatio, a speaking), is an address, usually of a formal nature, and particularly applied to an address delivered by the pope at the College of Cardinals, on matters of importance to the Church.

ALLODIUM, al-lo'-di-um (Lat. from the Ger. particle an, and lot, land obtained by lot).—When the barbarons nations had invaded the Roman empire, the vassal's estate became certain for life, then went to all vissas sestate became certain for int, then went to as his descendants. Opposed to feudal property, is allodium, which is a possession held in absolute independence, without any acknowledgement of a lord paramount. There are no allodial lands in England, all mount. There are no allodial lands in England, all being held, either mediately or immediately, of the queen. Allodium obtained among our Saxon ancestors, and gave birth to gavelkind (which see). Instances of the term occur in Domesday Book, where it signifies a free manor; and Aladorii, lords of free manors, or lords paramount. — Ref. 1 Co. Litt. 5; Cowell; Blount; Rob. vol. i. ch. v. note 8.

ALLORIANR, ill-lo-fain (Gr. allos, other, phaine, I appear), in Min, the name given to a clayey mineral, of a pale blue or greenish colour. Chemically, its a hydrated silicate of alumina. It loses its colour before the blowpipe: hence its name.

before the blowpipe; hence its name.

ALLOTHOMISM, dl-lot-ro-pism (Gr. allotropos, capable of being turned from one thing into another), in Chem., a term applied to a modification in the properties of a body, not resulting from chemical combination, but from the arrangement of its molecules. Phosphorus, in its usual state, is a waxy, semi-trans-parent body, of a pale lemon-colour, which is so inflammable that the heat of the hand is sometimes sufficient to kindle it; but, by a simple though dangerous process, this substance can be procured in dangerous process, this substance can be procured in an allotropic state, when it is an infusible substance of a dark-red colour, which will not take fire until heated to 500° F., when it is reconverted into ordinary phosphorus. Again, iodide of mercury, when freshly sublimed, is of a lemon-yellow colour, but it becomes scarlet if pressed or agitated. Sulphur can be made to take searce alluttopic forms. The diamond The diamond.

Alloy.

Alloy.

graphite or plumbago, and soot, are allotropic forms of the element carbon. Silice is soluble in water in one allotropic state, and insoluble in mother. In all these cases, the change of properties is not due to the addition or subtraction of anything, but to some inexplicable molecular action.

Alloy, ill-loi' (Fr. allier, to mix), a natural or artificial mixture of two or more metals. Alloys appear, from the experiments of Boussingault, Crookewitt, Hunt, and others, to be definite chemical compounds. This view is confirmed by several facts. Native alloys generally occur in atomic combination. Alloys are always different in colour, density, and other physical properties to those that would be possessed by a mere mechanical mixture of their constituent metals. Brass, for instance, is a yellow compound of a red and white metal. Speculum metal is so brittle that it may be pounded in a mortar; while its constituents, tin and copper, are malleable metals. The principal alloys will be noticed in detail under their respective metals or names. The word alloy, at one time, was used in a depreciatory sense, and was applied to the mixture of gold or silver with a baser metal; but it has since received an extended signification, meaning the union received an extended signification, meaning the union of two or more metals, except when mercury is one of them, the word amalgam (which see) being used in this case. The principal alloys used in the arts are pewter, brass, bronze, electrum, solder; German and nickel silver; bell, Britannis, gun, speculum, and type-metal. Some metals of little value whilst remaining in their pure state are made useful by the new properties they assume in combination with others. Most alloys are mixtures of no exact proportions; the metals dissolve in one another indefinitely, as sulphuric acid unites with water. Some, however, appear to be combinawith water. Some, however, appear to be combina-tions in equivalent proportions; and of these there are found examples in nature, as of the native gold, which occurs combined with silver, -4, 5, 6, or 12 atoms of gold to one of silver, but never a fractional part of an atom of gold. Alloys are always more fusible than the metal most difficult to melt that enters into their combination, and generally more so than the most easily melted one. Sir Isaac Newton discovered a fusible metal, which melts at different temperatures between 198° and 210° F. Its composition is as follows :- Bismuth

5 or 8 parts, lead 2 or 5, tin 3 parts. These metals melt, the first at a temperature of 476°, the second at about 600°, and the last at 442°. As conductors of electricity and heat, alloys are less perfect that of electricity and heat, alloys are less perfect than the pure metals which enter into their composition; they are also generally more brittle, but their power of cohesion is usually greater than that of either of the metals, the alloy resisting more strongly the force applied to draw a har apart than does a bar of either one of the metals composing it. Metals possess the very curious property in the tendency of one, when melting, to cause any other in contact with it, however infusible, to melt likewise. The easily-melted metals act like fluxes upon those most difficult to fuse. On this property is based the principle of soldering two pieces of metal by means of a third. Their surfaces are fixed together by interposing an alloy which is more fusible than either of the metals to be joined. more usible than etter of the meals to be joined. Gold may be soldered by an alloy of gold with silver or with copper; pieces of silver are soldered by an alloy of silver and copper; articles of copper are soldered with an alloy termed "hard solder," which is composed of brass and a large proportion of zine. At the present time the number of alloys in use are very large, and new and important combinations are being constantly discovered. One of the most valuable is that alloy denominated "Munta's metal;" it is a arge, and new and important combinations are bein vellow metal, containing from 40 to 60 parts of sine with 60 of copper, and is used for sheathing. alloys of which printers' types are made are composed of lead and antimony in proportions varying with the kind of types. Silver is too soft to be used in a pure state; hence it is usually alloyed with copper to give it The standard silver of Great Britain conhardness. narquess. The standard sever of Great Britain consists of silver 11·10, copper 0·90. In France the proportions are, 9·5 silver, and 0·5 copper; trinkets, silver 8 parts, copper 2 parts. The gold coins of Great Britain contain 9·10·66 parts of gold in the thousand, the remainder being mostly copper. The French standard conforms to that of the United States-900 parts fine gold in the thousand. The silver coins of this country contain 925 parts fine metal; the rest is copper. The metals most in use are, excluding platanum, eleven in number. They may be divided into five classes, according to their physical properties:—

Metals.	Hardness.	Melting Point.	Tenneity in pro- portional numb.	Specific Gravity.	
I.—Brittle Metals. Antimony	Scratched by glass	A little above red heat Volatizes below red heat 2:6° C.	Almost nil {	6 70 6 82	
II.—Intermediary Metal. Zinc	Scratched by glass	370° C.	4. 9	7	
III.—Ductile Metals. Iron	Scratched by glass	130° Wedgw. Pyrometer 32° 27° 20°	24 6·80 13· 8· 5	7·78 19·25 8·89 10·47	
IV.—Soft Metals. LEAD	Scratched by the finger nail Scratched by carbon, of lime	322° C. 210° C.	1. 1.20	11·95 7·29	
V.—Liquid Metal. Mercury		•		18-56	

# ALLOYS OF METALS WITH THE BRITTLE METALS.

With Arsenic.		Antimony.	Bismuth.		
Zixc	Difficult of preparation. Very brittle. Of little interest.	Very brittle. Steel-grey. Hard and very combustible.	Unknown,		
IBON		70 of antimony and 30 of iron are somewhat fusible. Very hard and white. An alloy of 2 of iron and 1 of antimony more hard.			

	Alloy.		Alloy.
With	Arsenic.	Antimony.	Bismuth.
GOLD	Grey metal. Very brilliant.  62 parts of copper and 57 of arsenic. A grey, brilliant, brittle metal. Fusible at red heat. By increasing the quantity of copper it becomes white and somewhat ductile. Used in making buttons, under the	for gold; the slightest fumes of it are sufficient to alter the ductility of that metal. The alloys are pale-yellow, with a fracture like that of porcelain. Rapid combination by the fa- sion of the two metals. The	Similar to that of antimony.  Of a yellow-green colour.  Alloys brittle. Pale red colour.
SILVEB	name of white copper, or tombac.  85 parts of silver and 14 of arsenic. Greyish-white brittle metal. Takes a high	Have a very great affinity. Alloys always brittle.	Alloys brittle and lameliated. Rather white in colour.
Tin	polish. Arsenic renders lead brittle. The combinations are greyish-white. Not decomposed by heat proving close atomic combination.  Grey, lamellated. Less fusible than tin.	Antimony gives hardness to lead. 76 parts of lead and 25 parts of antimony appear the point of saturation of the two metals. Very much harder than lead. When the proportions of antimony are increased, the alloy becomes very brittle.  The alloys of antimony and tin are as white as tin, much harder, and less ductile. They become brittle when the arsenie is in a large proportion. The alloy formed by 80 parts of tin and 20 of antimony may be made into plates suf-	The alloys of bismuth and lead are less brittle and more ductile than those with antimony, but less hard also. 3 of lead and 2 of bismuth has a colour intermediary between tin and lead. It is very ductile. Very fusible.  Tin and bismuth unite easily in all proportions by fusion. The alloys are harder and more fusible than either of the two separate metals.
MERCURY	Without interest.	ficiently hard to engrave music upon. Without interest. A white gritty metal.	Mercury dissolves a large quantity of bismuth with- out lozing its fluidity. The alloy of 1 of bismuth and 4 of mercury very fusible.

# ALLOYS OF ZINC.

The presence of zine always gives increased hardness to the metals with which it is combined. It is an important circumstance to note that it is volatile, and its oxidation is very rapid, facts which render the making of alloys of zine very difficult. With irea it forms an alloy very difficult of manufacture, one metal being volatile and the other very refractory. With gold it forms alloys of a greenish-yellow, very brittle, and susceptible of taking a high polish. With copper it forms very important alloys; it whitens the colour of the copper, forming an alloy which has a fine golden yellow, much used for the manufacture of imitation gold jewellery. With a larger proportion of zine the colour becomes yellowish-green, and pusses to a greyish-blue when its proportions are more than half of the alloy. These alloys are all more fusible, harder, and less oxidizable than copper. Those which contain a third of their weight of zine are very malleable and ductile at ordinary temperatures, but become very brittle at a slight degree of heat. With silver zine combines easily; it is a brittle bluish-white alley, not comployed in the arts. With lead it produces a metal somewhat hard, and capable of taking a fine polish, without diminishing its malleability; the alloy is also more tough than lead, and its specific gravity is greater than the mean of the two metals. With this forms a metal remarkable for its great hardness and fusibility. With mercury it forms a white, very brittle metal.

"It is not a little curious to find that some of the

coins of high antiquity contain zinc, which does not appear to have been known as a metal before 1280 a.D. Albertus Magnus speaks of zinc as a semi-metal, and calls the alloy of copper and zinc golden marcasite; or rather, perhaps, he means to apply that name to zinc from its power of imparting a golden colour to copper. The probability is, that calanine was known from the earliest times as a peculiar earth, although it was not thought to be an ore of zinc, or of any other metal."—Ure. What is known as galvanized iron cannot be regarded as a true alloy of zinc with iron, Mr. Crawford's process was the first patented in this country. It was described in the "Repertory of Inventions" as follows:—Sheet iron, iron castings, and various other objects in iron, are cleaned and scoured by immersion in a bath of water, acidulated with sulphuric acid. After the oxide has been removed, they are scoured with a piece of the husk of a cocoa-nut. The sheets, or other objects in iron, are then dipped into a bath of melted zinc. The sheets are then dipped into a bath of melted zinc. The sheets are then alowly raised to allow the superfluous zinc to drain off, and are thrown, whist hot, into cold water, on removal from which they only require to be wiped quite dry. If the sheets be very thick, they are heated before being immersed, to avoid cooling the zinc. There are other processes for coating iron with zinc, the chief of which are Mallet's and Morewood's, and Rogers's processes.—Ref. Ure's Diotionary (6th ed.); Watson's Chemical Essays.

### DUCTILE METALS.

# Alloys which they form with themselves, and with the soft metals.

Izow.

Iron and gold form alloys with facility, the alloy being difficult of decomposition. The alloy containing one-twelfth part of iron is of a pale yellow coflour; that composed of a fifth or a sixth is yellowisherey. This last is employed in jewellery under the name of "grey gold." The alloy containing 3 or 4 of iron to 1 of gold is greyishwhite, and very hard. These metals become harder by tempering; the last-mentioned in particular. This alloy might be used in the manufacture of cutting instruments.

COPPER.

It is impossible to obtain a veritable alloy of copper and iron: nevertheless they may be allied by fusion. A tenth part of copper combined with brass gives a homogeneous product, very hard, more tough than brass, and which may eventually be turned to use.

SILVER.

Doubtful. Very little studied.

Gold and copper form alloys in all proportions; the metals being harder than gold; the maximum belongs to the alloy containing an eighth of copper. It is also more fusible than gold and a little less ductile. It is on account of its greater hardness that this alloy supersedes pure gold in coining money, and in the manufacture of jewellery.

Gold and silver mix readily together, but do not appear to form a true combination. The alloys are of a whitishgreen colour; a twentieth part of silver suffices to change the colour of the gold. They are more fasible than gold, very ductile; harder, more elastic, and more sonorous than gold and silver separately. The jewellers often make use of "green gold" composed of 70 parts of gold and 30 parts of silver; this slloy corresponds almost identically with the combination possessing the maximum of hardness.

Silver and copper are easily allied in all proportions. These alloys are largely used in the arts, being almost as ductie as pure silver, at the same time possessing more bardness and clasticity. The colour of the alloys remains white even when the copper forms quite half of the compound. The maximum of hardness belongs to the alloy containing one-fifth part copper.

Soft Metals.

No alloy can be obtained between iron and lead. Alloys very brittle; a twothousandth part of lead suffices to alter the dustility of gold. The alloy containing an eighth per cent. of lead is pale yellow in colour; extremely brittle.

Do not appear capable of forming true alloys.

Lead and silver unite in all proportions; a minute quantity of lead suffices to greatly diminish the ductility of the silver. The alloys are nevertheless ductile to a certain degree; they are likewise more dense and fusible than the metals composing them.

DUCTILE METALS.

Soft Metals.

Alloys which they form with themselves and with the soft metals.

Iron.

The alloys of tin and iron are brittle. A very small quantity of iron as malleability of the tin, it tarnish its colour, and pive it hardness. The alloy composed of 8 Tarts of tin and 1 of airon is partially malleable when cold; when heated it is brittle. It may be out with a pair of shears. Its granulation resembles that of of steel. Its apecific gravity is 7,248. With

GOLD.

The alloys of tin and gold are brittle; they are, however, distinguished by some ductility when the procession of the tin do not exceed one-twelfth. Their colour is pale or almost white.

COPPER.

The alloys of copper and tin are of extreme importance in the arts on account of their great toughness, their hardness, and their fusibility. The alloy composed of 76 parts of copper and 24 of tin is white, very brilliant, and brittle. The alloy composed of 90 parts of copper and 10 of tin is of a sombre yellow colour, more fusible, harder and tougher than copper; less oxi-

SILVER.

The alloys of silter and tin are very hard; a small quantity of tin suffices, to destroy the ductility of the silver

Tim .....

Alloy.

GOLD.

Alloy.

SILVER

10 parts of tin and 1 part of iron an alloy is prepared easily fusible, hard and tough, which may be utilized formany kinds of eastings.

IRON.

COPPER.

dizable in the air, but of little malleability.

Liquid Metal.

MER-

Mercury has no action upon iron. This is why vessels of iron are always used to contain it. The amalgams which may be obtained are without stability.

Mercury has a very decided action upon gold; it dissolves it rapidly, and in great quantity without the resulting amalgam crasing to be liquid. The point of saturation appears to be 2 parts of gold to 1 of mercury. The compound is white, pasty; it crystallizes by slowly cooling.

Mercury and copper form annalgams very difficult of preparation. They are without interest.

Mercury behaves towards silver almost in the same way it coss with gold. An amalgam of silver is employed for the purpose of silver, just as an amalgam of gold is made use of to gild,

SOFT METALS.

Alloys which they form with themselves and with Mercury.

LIN.

LEAD.

Lead and tin form alloys easily, by fusion. The alloys are less white than pure tin, but very much harder. The hardest and toughest metal is composed of 25 parts of lead and 75 parts of tin.

The alloy composed of 33 parts of tin and 67 parts of lead is greyish white in colour, mullcable, more fusible than tin; burns at a red heat. Its specific gravity is 9.55.

It is a remarkable fact that lead increases the hardness of tin.

Liquid Metal.

MERCUEY

Mercury and tin upon being subjected to heat combine in all proportions; even when cold an amalgam is formed. The amalgam formed of equal parts of the two metals is solid. That composed of 10 parts of mercury and 1 of tin is liquid and resembles mercury, but

it flows less freely.

Mercury dissolves lead even when cold by means of trituration. When heat is employed, the dissolving power of the mercury is very rapid. It is capable of absorbing hali its weight of lead without losing its fluidity. The amalgam formed of equal parts of the two metals is susceptible of crystallization.

The remarkable series of experiments made by Professor Faraday and Mr. Stodart, an account of which will be found in the "Philosophical Transactions" and in the works of Professor Faraday, are of the highest interest to the manufacturer and to the student. Bespecting the alloy with silver these experimentalists remark:—"In making the silver alloys the proportion first tried was I silver to 160 steel; the resulting buttons were uniformly steel and silver in fibres, the silver being likewise given out in globules during solidifying, and adhering to the surface of the fneed button; some of these when forged, gave out more globules of silver. In this state of mechanical mixture the little bars, when exposed to damp atmosphere, evidently produced volcanic action; and to this we are disposed to attribute the rapid destructive action taking place when the two metals are chemically combined. These results indicated the necessity of diminishing the quantity of silver, and 1 of silver to 200 steel was tried. Here again were fibres and globules in abundance; with 1 to 300 the fibres diminished, but still were present; they were detected even when 1 to 400 was used. The successful experiment remains to be named. When 1 of silver to 500 steel were properly fused, a very perfect button was produced; no silver appeared on its surface; when forged, and dissected by an acid, no fibres were seen, although examined by a high magnifying power. The specimen forged remarkably wall. Although very hard, it had an every respect the most favourable appearance. By a delicate test every part of the bar gave silver. This alloy is decidedly superior to the very best steel, and this excellence is unquestionably owing to a combination with a minute quantity of silver. It has been repeatedly made and always with equal success.

best quality. This alloy is, perhaps, only inferior to that of steel and rhodium, and it may be produced at small expense; the value of silver, when the proportion is so small, is not worth naming; it will probably be applied to many important arts." The researches of these philosophers show that besides silver, gold, copper, platinum, rhodium, nickel, and even tin, may be made to form an alloy with steel. With respect to the chemical properties of alloys: alloys, generally speaking, behave in a manner similar to the pure inetals of which they are composed. Their composite nature, however, modifies in particular instances and in a very notable manner, the action of divers chemical segnits.

With respect to other important but little-known alloys, we find the following in Ure's Dictionary of Arta, Manufactures, and Mines:—"Iron and nickel unite in all proportions, producing soft and tenacions alloys. Some few years since, Mr. Nasmyth drew attention to the combination of silicon with steel. Fresh interest has been excited in this direction by the investigations of a French chemist, M. St. Claire Deville, who has examined many of the alloys of silicon. Silicon and iron combine to form an alloy which is a sort of fusible metal, in which carbon is replaced by silicon. The siliciurets are all of them quite homogeneous, and are not capable of being separated by lignation. Copper and silicon united in various proportions, according to the same chemist:—A very hard, brittle, and white alloy, containing 12 per cent. of silicon, is obtained by melting together 3 parts silico-fluoride of potassium, I part sodium, and I part of copper, at such a temperature that the fused mass remains covered with a very liquid secris. An alloy with 5 per cent. silicon has a beautiful bronze colour, and will probably receive important applications."—Ref. Encyclopédie Technologique.

### All-Saint's Day

The following tabular view of the composition of the principal alloys of copper is borrowed from Messrs. Oxland and Truran's "Metals and their Alloys."

	Copper.	Zinc.	Tin.
Antique bronze sword	87:000	•	13:000
Bronze for Statues	91.400	5.530	1.700
, for Medals	90-000	-	10.000
for Cannon	80.000		10.000
for Gilding	B2·257	17:481	0.238
Speculum Metal	66 0 <del>0</del> 0		<b>33</b> ∙0∶0
Brass for Sheet	84.700 .	15.300	-
Gilding Metal	73.730	27-270	
Pinchbeck	80-200	20 000	
Dutch Metal	84.700	15.300	
English Wire	70.290	29.260	0.17
Mosaic Gold		33.000	
Gun-Metal	<b>90:3</b> 00	9.670	0.03
Muntz's Metal	60.000	40.000	
Good Yellow Brass	66.000	33.000	
Rabbit's Metal for			
Bushing	8:300	_	83.00
Bell - Metal for Large			
Bells	801000	_	20.00
Britanna Metal	1.000	2:00	81.00
Nickel Silver, English	60.000	17.8	
,, Parisian	50.000	13.6	
German Silver	20.000	25 0	

ALL-SAINTS' DAY (in old English, All-Hallors, All-Hallors, all-Hallormas, or simply Hallormas), a festival of the Roman Catholic church, celebrated on the 1st of November, in commemoration of all the saints in general. The saints had become so numerous in the Church, that a day could not be set apart for each of them; in fact, there were not days chough in the year for that purpose; and hence, in 835, the 1st of November was appointed for all such as had not special days for themselves. The popular usages which in our own and other countries have come to be connected with this day, or rather the preceding eve or night, are evidently of pagan origin, and came afterwards to be sanctioned by the Church.

ALL-SOULS' Day, a festival of the Roman Catholic church, held on the 2nd of November, for the souls that are suffering in purgatory. It was first instituted at Clugny, by Odilo, abbot of that place, towards the end of the 10th ceftury, and soon came to be observed by the Church generally.

Allspice, and one of the Marie of the Marie of the Church generally.

Engenia Pimento, a plant of the Myrtle order. It is much used as a spice, and is thought to combine the flavours of cinnamon, cloves, and nutmegs; hence its common name. It is sometimes called Jamaica pepper, from the island in which it is chiefly cultivated, and sometimes pimento,

Allusion, ill-lu-shun (Lat. allusio, a playing or sporting with), in Rhet., a figure by which is denoted an arrest of the control of the cont something as applied to, or understood of another, on account of some similitude between them.

ALLUVION, dl-lw-vi-on (Lat. ad, to, and luo, I wash upon,—an accretion), in Law, is where land is gained from the sea by the washing up of sand and earth, so as in time to make terra firma.

ALLUVIUM, al-lu'-vi-um (Lat. alluere, to wash upon), in Geol., a name formerly given to those accumulations of sand, earth, and loose stones or gravel brought down by rivers, which, when spread out, form what are called alluvial plains and deltas. The term is seldom employed by modern geologists. (See FLUVIATILE DEPOSITS, DRITA.)

DEPOSITS, DELTA.)

ALLYLE, dP-lile, in Chem., a hypothetical organic radicle, having the composition  $C_0H_{11}$ , supposed to exist in the fetid oil obtained from garlic. This oil is called by chemists sulphide of allyle, its composition being  $C_0H_1S_1$ , or six equivalents of carbon, five of hydrogen, and one of sulphur. To the presence of this compound the odour of the whole chion family than Assafratida also contains this (see Allium) is due. Assafætida also contains this troug-smelling oil.

ALMACANTAR, or ALMUCANTAR, al-ma-can'-tar (Arab almocarhurat), in Astrom. a term formerly applied to all the small circles parallel to the horizon. Thus, any two stars having the same almacantars have the same altitude.

## Almoner

ALMAGANTAE'S STAFF, in Astron., an instrument formerly used at sea for observing the sun's amplitude at rising or setting, whereby to determine the variations of the compass, &c.

ALMAGEST, 20-ma-jest, the name of a celebrated book composed by Ptolemy, being a collection of a great number of the observations and problems of the annients relating to geometry, and servences. ancients, relating to geometry and astronomy, but especially the latter. It is the first work of this kind which has come down to us, and contains a catalogue of the fixed stars, with their places, besides numerous records and observations of eclipses and the motions of the planets.

ALMA MATER, al'-ma mai'-ter (Lat., a nourishing mother), a term applied to a university by those who have studied at it, to distinguish it from inferior schools of learning.

ALMANAC, all-mo-nik (Arab. al, the, and manak, to count), is an annual publication, giving the civil dirisions of the year, the movable and other feasts, the times of the various astronomical phenomena, and other useful or entertaining information. Almanacs existed among the Alexandrian Greeks in or after the existed among the Alexandrian creeks in or after the time of Ptolemenus. The time of their first appear-ance in Europe is not known. The first of any note was that by Purbach, 1450-61. The first printed almanac was that of Regiomontanus, which appeared from 1475 to 1506. In England the universities and the stationers' company possessed a menopoly of the trade in almanaes from the time of James I. to 1775, when a decision of the court of Common Pleas in favour of one Carnan, a bookseller, abolished it. The Nautical Almanae, published by the Admiralty, for the USG of astronomers and seamen is brought out trace. use of astronomers and seamen, is brought out two or three years in advance. The stamp duty, of fifteen three years in advance. The stamp duty, of fifteen pence per copy, to which almanacs were long subjected,

pence per copy, to which amandas were long surjections, was abolished in 1834. (See CALENDAR.)

ALMANDINE, di-man'-deen, in Min., a gem found in Greenland, Ceylon, and the Brazila. It is an iron garnet, and consists of silica 86'3, alumina 20'56, pretoxide of iron 33'2.

ALMAYNE RIVETS, all-main.—In the 17th century almayne rivets were introduced as a means of holding together the overlapping plates of armour worn accedefence to the person. The thigh-pieces of the defence to the person. The thigh-pieces of the mailed suit in which the Swiss soldier shown at p. 45 is attired, were secured together by these rivers, which, being constructed to move in slits, allowed of a which, being constructed to move in suts, allowed or we freer motion to armour than it formerly had. They were invented in Germany: whence the name, almayno being the medieval word for Germany.—Ref. Hewitt's Ancient Arms and Weapons in Europe; Skelton's II.

Lustrations of the Goodrich-Court Armoury.

ALME, or ALMA, al'-me, are a class of girls in Egypt. ALME, Or ALMA, at me, are a class or gure in Legyus, whose occupation it is to amuse company with singuing and deneing, and who, like the Italian improvisators, can occasionally pour forth their thoughts in unpremeditated verse. They are called Alme from having received a better education than other girls.

ALMOND, a'-mond, in Bot. (See ANTGDALUS.)
ALMONER (formerly called almatour), a'-mo-ser (Fr. aumoner, to pay a time for the poor), in the primitive sense of the word, denoted an officer in a religious house, to whom belonged the management and distribution of the alms of the house. By the ancient canons, all monasteries were to spend at least a tenth part of their income in alms to the poor. The almoner of St. Paul's was to dispose of the moneys left for charity according to the sppointment of the donors, to bury the poor who died in the neighbourhood, and as breed up eight boys in singing, for the use of the choir. By an ancient canon, all bishops are required to keep almoners.—The Almoner (le Grand Asmonier) of France was the highest ecclesiastical dignitary in that kingdom before the Revolution. To him belonged the superintendence of all hospitals and houses of lepers. The king received the sacrament from his hand, and he said mass at all grand solemnities. Almoner is also a fashionable title given by some writers house, to whom belonged the management and distri-bution of the alms of the house. By the anotenic moner is also a fashionable title given by some writers to chaplains. In this sense we meet with almoner of a ship, almoner of a regiment, &c.—Almoner, Lord, or Lord High Almoner of England, is an ecolosiastical officer, generally a bishop, who had formerly the forfeiture of all decidands (which are now abulished), sun the goods of felos-de-se, which he was to distribute

# Alms

amongst the poor, and his office was to give the king's alms every day. He also had the power of giving the first dish from the king's table to whatever poor person he pleased.—Ref. Rieta, lib. 2, cap. 22.

ALMS, ams (Sax. aims), denotes what is given out of charity to the poor.

ALMSAURE and Alexandra.

ALMSGOUS, an edifice, or collection of tenements, erected generally by a private individual, and endowed with a revenue, for the maintenance of a certain num-

ber of poor, aged, or disabled persons.

ALNAGE, al'-naj (Fr. aulnage), a measure, particularly the ell.—Ref. Cowell; Blount.

Athages, or AULIAGES, al-na-jer (Fr. alner), is properly a measure by the ell, and the word aune, in French, signifies an ell.—Alnager was also an officer of the king, who, by himself or his deputy, looked to the assise of all the cloth made of wool throughout the land, and to put a seal for that purpose ordained, and he was to be accountable to the king for every piece of to the Mas to be accommanded to the Arthur was so scaled in a fee or custom appertaining to it.—Ref. Cowell; Blount; Termes de la Ley.

ALNUS, ül-nus, in Bot., the Alder, a genus of plants belonging to the Birch order Betulaces. The species

d. glutinose is a well-known tree. Its timber resists the destructive action of water for a long time, and on this account is much used for the piles of bridges. Its bark is satringent, and has been employed in medicine and for tanning; it is also used as a dye-stuff, giving a red colour when slone, and black when added to a solu-tion of copperas. It is a low tree with a rugged bark, and grows in moist situations. The leaves are roundish, waved, serrated, and somewhat sticky, being downy The leaves are roundish, underneath about the veins. The flowers grow in long hanging catkins. The species A. incana is found in Kamtschatka, where its bark is used for making a kind

ALOA, äl-o'-ä, in Grecian Ant., certain festivals cele-brated at Athens in honour of Bacchus and Ceres, at the time of harvest, when the first-fruits of the earth were offered to the god or goddess. The term was derived from alos, a barn: whence Ceres came to be called Alous, that is, a filler of barns.

ALOE, &\*l'-o (Lat.), in Bot., a genus of monocotyle-donous plants belonging to the nat. ord. Liliacea, the

Lily tribe. There are several species, all natives of warm climates, but capable of being cultivated in colder regions as ornamental garden plants. The leaves are succulent, and edged with spines; they yield the juice which, when inspissated, constitutes the bitter drug called aloes (see this word). The flowers constitutes the are usually red, growing in a bunch at the top of the stem. Some of the larger kind of aloes are of great importance to the inhabitants of countries in which they grow. Beset as the leaves are with atrong spines, they form an impenetrable fence. The negroes of the western coast of Africa make ropes and weave nets from the fibrous parts of the aloe leaf. From the stems of one kind the Hottentot hollows out his quivers. The juice of aloes was formerly used in eastern countries in embalming, in preserving dead bodies from putrefaction; and as the resinous portion of this juice is not soluble in water, it is sometimes adopted in hot climates as a preservative to ships' bottoms against the attacks of marine insects. In the East-Indies, the juice of these plants is used as a varnish to preserve wood from the attacks of destructive insects; and skins, and even living animals, are often smeared with it for the same purpose. About fifty miles to the morth of the Cape of Good Hope there is a tract of

morth of the Cape of Good Hope there is a tract of mountains wholly covered with aloes. In the arts, a particularly beantiful violet colour is obtained from the leaves of the Socotrine aloe (A. Socotrina).

ALOE, THE GREAT AMERICAN.—According to Browne's "Natural History of Jamaica," the largest and most succellent leaves of the Socotrine aloe are placed upright in tubs to allow the juice to dribble out, (See AGAVE.)

ALOES, a drug used medicinally in small doses as a ALORS, a crug used medicinally in small closes as a toulo, and in larger doses as a purgative and an em-surangogue. It is the inspissated juice of the leaves of various species of Aloe. There are several com-mercial varieties imported, but the origin of some is not accurately determined. Barbadoes aloes is obtained from the species Alos vulgaris. Both soccotrine and hepatic aloes are probably prepared from A. soccotrina

# Alphabet

and A. purpurascens; for the difference between the two and a. purpurazeons; for the difference between the two kinds may be accounted for by a difference in the mode of treating the juice. Thus, when the juice from the species A. soccotring is inspissated by artificial heat, the product resembles soccotrine aloes; but when it is allowed to dry up without the aid of artificial heat, it resembles hepatic aloes. Cape aloes is chiefly ob-tained from A. spicate; Indian aloes from A. indica; but the varieties known as borse or calculing aloes; but the varieties known as horse or caballine aloes, Mocha aloes, and Curaçoa aloes, have not been traced to their respective sources.

to their respective sources.

ALORITO ACID, di-o-et'-ik, an acid formed by the action of nitric acid upon aloes, used in dycing.

ALOPT, d-loft', in Mar., signifies at the masthead, or in the tops or higher part of the rigging.

ALONGSEDE, d-long-side', in Mar., a term importing that a ship is parallel to another, or to a wharf.—Along-shore, navigating a vessel along the shore or coast.—Along-shore Owner is one who sends his vessel to see in ways of stores and novisions.

to sea in want of stores and provisions.

Alonsume or Alphonsune Tables, a-lon'-sin, an astronomical work which appeared in the year 1252, under the patronage of Alonso X., reputed by some to be constructed by Isaac Ben Suid, a Jew; by others, by Al Cabit and Aben Ragel, the preceptors of Alonso.—Ref. Delambre, Histoire de l'Astronomie du Moyen

ALOYSIA, or LIPPIA, a-loi'-si-a, in Bot., a gen. of plants belonging to the nat. ord. Verbenacea. Aloysia, or Lippia citriodora, is the sweet verbena or lemon-

plant of our gardens.

ALPACA, il.-pik-a, in Zool., a species of the gen. Lams, with which it is so closely allied, that by some it is set down as being only a variety of it. The alpaca inhabits the mountainous parts of Peru, and obtains its aliment from the coarse and scanty herbage growing on the sterile soil of those elevated regions. Its general form hears a close resemblance to that of the sheep, but its head and neck are more graceful. The upper part and sides of this animal's body are covered with light chestnut-brown wool, which hangs down in slightly light chestnut-brown wool, which hangs down in slightly curled meshes almost a foot in length. This wool is extremely soft and elastic, and is nearly as fine as that of the Cashmere goat. The face, up to the posterior margin of the jaws, has short smooth hair; but, from the forehead, a stiff silky hair falls over the eyes. The shearing of the wool takes place annually, from 10 to 12 lbs. of wool being obtained from a single animal.

Alpaca Wool being obtained from single animal.

Alpaca Wool.—This valuable product is obtained
from the alpaca, or paco, an animal half sheep half
gost, inhabiting the mountains of Peru. Great efforts
have been made to naturalize it in this country, in
Germany, and in Australia. In the latter country, the experiment has been attended with great success. The wool of the alpaca is long, lustrous, and silky. Its manufacture into textile fabrics was begun in 1843, at Braiford, in Yorkshire, and has since progressed at such a rate, that Mr. Titus Salt, of that town, has built one of the largest and most splendid factories in the world, which in itself constitutes a town called Saltaire, a compound of the name of its founder and that of the

river upon which it stands.

ALPHABER, all-fu-bet (from alpha and beta, the names of the two first letters of the Greek alphabet), is a term applied to the letters of which a language is composed, in their natural or accustomed order. In spite of the extreme diversity of languages, most alphabets present, in the number, order, and even form of their letters, decided evidences of a common origin. It has been disputed, whether to the Egyptians, Chal-deans, or Phœnicians, belongs the honour of having invented the written characters. The common opinion, however, is, that we are indebted for them to the Phænicians. Cadmus is said to have brought the Phomicians. Cadmus is said to have brought the Phomician alphabet, consisting of 15 letters, into Greece, about 1493 n.c. This was subsequently altered and added to, and became the ground of the Roman alphabet, which is now in use over Europe. The English language comprises 26 letters; French, 25; Italian, 20; Spanish, 27; German, 26; Russian, 41; Latin, Hebrew, Chaldee, Syriac, 22; Greek, 24; Arabic, 28; Persian, 32; Turkish, 33; and Sanskrit, 50. The Chinese have, properly speaking, no alphabet; but they have 214 radical or elementary characters.

ALFINIA, & l-pin'-1-a (from Prosper Alpin, a celebrated botanist), in Bot., a gen. of aromatic herbaceous plants, in the nat. ord. Zengiberacea, the Ginger tribe. The roots of the species A. galanga and A. chinense constitute respectively the Java and Chinese, or greater and lesser galangals. These foots have similar properties to ginger, and are used for the same purposes. The ovoid China cardamum, used in veterinary medicine, is the fruit of A. alba. The seeds of this plant are commonly employed as a condiment by this plant are commonly employed as a condiment by the Chinese.

ALSINER, dl-sin'-e-e, in Bot., the Chickweed sub-ord of Caryophyllacea. There are numerous genera; Alsine, Cerastium, Arenaria, and Stellaria, being exam-

(See CARYOPHYLLACER.)

AL SINAT, se-rat' (Arab., the path), according to the belief of some of the Mahometan sects, is the name of the bridge which spans Hades, and over which every one must pass in order to enter Paradise. It is said to be as narrow as the edge of a razor. Those who are unencumbered with the weight of sin may pass over it with the rapidity of a steed in full course; but those whose iniquities bear them down, will tumble from it into the infernal depths beneath.

ALSOBER, di-so'-de-e, in Bot., one of the two sub-orders into which the nat. ord. Violuoca has been divided. The species have regular flowers, with an-thers not furnished with appendages. (See VIOLACER,

VIOLEE.)

ALSTONIA, il-sto'-ne-a, in Bot., a gen. of dicotyle-donous plants, belonging to the nat. ord. Apocynacea, the Dog-hane tribe. The species A. scholaris has a bitter tonic astringent wood, and is a native of South America.

ALSTREMERIA, dl-stre-meer'-i-a, in Bot., a gen. of plants belonging to the Amaryllis ord., or Amaryllidacew. The species are all South American. Their leaves are twisted, so that what should be the upper surface becomes the lower; their roots are succulent, and rich in starch. The starch is extracted, and used as a kind of arrowroot by the inhabitants of the districts wherein these plants flourish.

ALT, alt (Lat. altus, high), in Mus., a term applied to that part of the scale which commences with F, the fifth line in the treble clef, and ends at E, the third

ledger line above the same clef. ALTAB, awl'-tar (Lat. altare), a place erected to offer

sacrifice upon. The first altar of which we have any notice was that erected by Noah when he quitted the ark. In the tabernacle, and afterwards in the Temple, two altars were erected, one for sacrifices the other for incense. The table for shewbread is also sometimes called an altar. Among Christians, the al-tar is a square or oblong table, or tablet, placed at the east end of the church, for the celebration of the mass in Roman Catholic, or of the sacrament in Protestant churches.



ALTAR-PIECE, is a painting in churches,

over the altar. They seem not to have been introduced until about the end of the 4th century.

ALTERATIVES, awl'-ter-d-tips (Lat. altero, I change), in Med., is a term employed to denote a class of remedies that have the power of gradually changing the state and condition of the functions, secretions, &c., sna condition of the functions, secretions, &c., of the human body. Alteratives are usually administered in frequent small doses; and in this way some of our most active and even poisonous drugs produce very beneficial effects.

ALTERNATE, owl-ter-nait, in Her., a term used in respect to the situation of the quarterings. Thus, the first and fourth quarters, and the second and third, being generally the same, are called alternate quarters.

ALTERNATION, out-ter-not'-shun, in Math., a term ap-plied to the changes of orders in any number, called also Permutation. It is found by a continual multiplication

of all the numbers; thus, to know how many changes can be rung on six bells, multiply the numbers 1, 2, 3, 4, 5, 6 continually into one another, and the last product is the answer.

ALTERNATION OF GENERATIONS. (See GENERA-

TIONS, Alternation of.)

ALTERN BASE, audi-tern, in Math., a term used in contradistinction to the true base. Thus, in oblique triangles, the true base is either the sum of the sides (the difference of the sides then forming the true base), or the true base is the difference; in which case

base), or the true base is the limit the sum in the altern base.

ALTHEA, di-the'-ā (Gr. altheo, I heal), the marshmallow, a gen. of plants belonging to the nat. ord. Markaceæ. The species A afficinalis, the common marshmallow or wymote, is an indigenous perennial, growing in salt marshes near the see, and on the banks of rivers. blossoming during August and September. Its flowers which are rather large and rose-coloured, are arranged, three or four together, on axillary stalks. The leaves are hoary, green, odourless, soft, and downy, having a mucilaginous taste. The whole plant abounds in mucilage, particularly the root, which is used in medicine. In France, marsh-mallow is a favourite demulator of the formulation of the formula cent. The famous patte de Guimauve is composed of the substances obtained from the root, with gum-arabic, sugar, and white of egg. Buchner states that the chief constituents of the marsh-mallow root are a fatty oil, starch, glutinous matter, uncrystallisable sugar, althein, and mucilage. Its chief principle, althein, is identical with asparagine. It is crystal-A. rosea, the lizable, odourless, and almost tasteless. hollyhock of our gardens, is another well-known species. It has similar properties to the common marsh-mailow, and its flowers are officinal in Greece. From the leaves, a blue colouring matter resembling indigo is extracted. Strong fibres suitable for cordage have been obtained from the stem.

ALTITUDE, & Atti-tude (Lat. altitudo, height), in Astron., is the height of a celestial body above the horizon. It is measured by the angle which a line from the eye to the star or planet makes with the horizontal tine eye to the star or planet makes with the horizontal line. An altitude may be true or apparent. If it be taken from the real horizon, the altitude is true; if from the apparent or sensible horizon, the altitude is that which appears to our observation, and the true is that from which the refraction is subtracted. The true altitudes of the heavenly bodies differ but little from their apparent altitudes, on account of their distance from the earth's centre, and the smallness of the mark's from the earth's centre, and the smallness of the earth's semi-diameter compared thereto. In observatories, altitudes are taken by means of telescopes attached to graduated circles, and at sea, by instruments called

sextants. (See Astronomy.)

ALTITUDE, in Geom., one of the dimensions of a body, being the same with what is commonly called height. The altitude of a figure is the distance of its body, boing the same wind what is commonly called, height. The altitude of a figure is the distance of its vertex from its base; in other words, it is the length of a perpendicular line let fall from the vertex to the base. The altitude of a cone is measured by a line perpendicular to the plane of the base, drawn between the vertexand base of the cone.

ALTO, all'-to, in Mus., a term applied to the highest male voice, the ordinary compass of which is from F, the fourth line in the bass, to C, the third space in the treble.

the treble.

ALTO CLEF. (See CLEF.)

ALTO RELIEVO. (See RELEVO.)

ALUDEL, äl'-u-del.—The sludels of the ancient chemists were pear-slaped glass vessels, open at both ends, which were joined together to form a series.

ALUM, äl'-um (Lat. alumen), a sait consisting of sulphate of alumins in combination with sulphate of protesh and ampropria phate of alumins in combination with sulphate of potash, soda, or ammonia. Potash and ammonia alum are used in dyeing, in calico-printing, in paper-making, in the manufacture of colours, and in medicine. Alum is obtained by submitting alumshale, which consists of alumina, from pyrites, and coaly matter, to the action of fire in enormous heaps for one or two years. During the combustion, the sulphur of the iron pyrites (sulphide of iron) combines with the oxygen and alumina, forming sulphate of alumina, which is dissolved out of the cooled mass by water. This solution is then converted.

# Alumina

into alum by the addition of either sulphate of potash or sulphate of ammonia, the latter being most generally used on account of its cheapness. The principal sources of alum-shale are at Hurlet and Campaie, near Glasgow, of alum-shale are at Hurlet and Campaie, near Glasgow, and at Whitby, in Torkshire. Alum is also manufactured in great quantities by Spence's process from various materials derived from coal and from the coal strata. Sulphurie seid is, in the first place, made from the iron pyrites with which the coal-measures abound. This when heated with coarted coal shale which coal This, when heated with roasted coal-shale, which con-tains alumina in large quantities, forms sulphate of alumina, with excess of sulphuric acid. The aumonialumina, with excess of sulphuric acid. The ammoniscal liquor of gas-works is boiled, and the vapour conducted through the hot solution of acid sulphate of alumina, the acid being neutralized by the formation of sulphate of ammonia. The ammonia alum crystallizes in large masses, and is purified by redissolving and recrystallizing. Ammonia alum is more valuable than potash alum, from containing 11-90 per cent. of alumins, which is the active ingredient, while potash alum contains but 10-82 per cent. About 20,000 tons of alum are now anually manufactured in the United of alum are now annually manufactured in the United Kingdom. Mr. Peter Spence, of Manchester, manufactures about one-third of this quantity. Soda alum is not used in the arts. The great use of alum in dyeing and printing is on account of the property posseesed by alumina of uniting with and precipitating cer-tain vegetable substances in an insoluble form. These, when made into pigments, form lake. (See DYKING, CALTCO-PRINTING, and LARES.) Muslin dipped in a solution of alum is rendered incombustible.

solution of alum is rendered incombustible.

Alumna, a-lu-mi-ma (Al<sub>2</sub>O<sub>3</sub>), the seaquicoide of the earth-metal aluminium, the principal constituent of clays. The hydrate is obtained in the form of a gelatinous precipitate, by sating ammonia, or carbonate of ammonia, to a solution of alum. By drying and igniting, it is changed into the anhydrous sesquioxide, insoluble in water, but soluble in acids and alkalies. Mr. Walter Crum has discovered a modification or allotropic condition of alumina produced by alkalies. Mr. Walter Crum has discovered a modifica-tion or allotropic condition of alumina, produced by igniting bi-acetate of alumina, which is soluble in water, and forms a translucent coagulum with dye-woods. By the addition of a small quantity of acid, alkali, or even neutral salt precipitation of alumina, in a third allotropic condition takes place; this form being insoluble in acids, but soluble in alkalies.

ALUMINA, ACETATE OF . The acetate of alumina is much used in the arts on account of the easiness with which it parts with its alumina. It is formed by adding acetate of lead to sulphate of alumina, and filtering off the insoluble sulphate of lead.

ALUMINA, SILICATE OF.—The chief ingredient in

ALUMINA, SILICATE OF.—The cuter ingredient in rommon clay.

ALUMINA, SULFHATE OF.—This salt is now used extensively in the arts, under the name of "aluminous cake," patent alum," and "concentrated alum." It is made by treating the calcined clays of Devonshire and Dorsetshire with sulphuric acid, precipitating the from, in the form of Prussian blue, by prussate of potash. This substance promises to supersede alum, being cheaper and containing a larger percentage of

alumins.

ALUMINIUM, čil-u-min'-i-um, in Chem., a metal, which has lately attracted much attention from its peculiar lightness. It was discovered by Wöhler in 1827. Its preparation has been very much simplified by the celebrated French chemist Doville, and it is now regularly prepared as a commercial product in the following manner:—Anhydrous alumina is mixed with charcoal and oil, and ignited in a covered crucible. When cold, the mass is broken to pieces, and exposed at a red, theat to the action of chloring ass. Chloride When cold, the mass is broken to pieces, and exposed at a red heat to the action of chlorine gas. Chloride of aluminium is formed, and, when cold, is mixed with half its weight of chloride of sodium and fluor spar. This mixture is placed in a crucible with one-eighth of metallic sodium, and hested to the melting-point of the misterials employed. The sodium seizes on the fallorine, leaving the aluminium in a reguliue state. Aluminium thus prepared is a bluish white metal, similar to silica. It becomes as hard as iron on being themselved and relied. Its extraordinary lightness. similar to suica. It decomes as nard as from on seing fammered and rolled. Its extraordinary lightness, \$5 (the specific gravity of glass) has already led to its employment in jewellery; and, as the manufacture be-becomes cheiger, many more uses will arise. It forms a hard gold-coloured alloy with copper, called slumi-

#### Amaranthaces

nium bronze, which promises to be useful. It consists of 90 per cent. of copper and 10 per cent. of aluminium. It consists Its other alloys are very promising, and are under investigation. Added to iron in the proportion of 25 per cent. it prevents the oxidation of that metal by per cent...it prevents the oxidation of that metal by moist air. Its price has decreased from £3 to 5s. per ounce during the last few years; and, being four times as light as silver, it only costs one quarter the price of that metal, weight for weight.

ALUMINIUM BRONZE. (See BRONZE ALUMINUM.)

ALUMINUM, a name given to the root of the Geranium maculatum, which contains much tannin. It is used in North America as an astringent.

ALUMS, in Chem .- Common alum is the type of a series of double salts, consisting of an ulkaline sulphate in combination with the sulphate of a metallicesesqui-oxide, but which do not necessarily contain alumina. The principal alums are :—
Sulphate of potash and alumina.

ammonia Bods potash and iron. manganese. 13

The alums crystallize in cubes or octahedree, and contain 24 equivalents of water of crystallization.

ALUMSTONE, or ALUNITE.—A mineral found near Civita Vecchia, in Choorin, at Pic-do-Landy, in France, and in the Grecian archipelago. It consists of alumina 37:13, suphurio acid 35:53, potash 11:34, and water 13. It is one of the principal sources of alum.

ALUEDIA, il-ve'-o-lu (Lat. alucolus, a small hollow vessel), in Bot., a term applied to any little pit or socket, but particularly to a cavity in the receptacle where the seed is placed.

where the seed is placed.

ALXXIA, it lix -i.a, in Bot., a gen. of dicotyledonous plants, belonging to the Dog-bane ord. Apocynacea.
The species A. stellata has an aromatic bark, resem-

bling in properties that of canella.

Ding in properties that of canella.

AMADOT, ām'-a-doo (Lat. all manum dulce, soft to the touch), a spongy substance, generally known as German tinder, which can be ignited by a spark from a fiint-and-steel. It is prepared by soaking thin slices of the funci Polyporus igniarius and fomentarius in a solution of intrate of potash (saltpetre), after they have been softened by beating with a mallet. Similar slices not treated with the salt are sometimes used in four to reflected parts and also to

slices not treated with the sait are sometimes used in Surg. to give support to affected parts, and also to restrain hemorrhage. Wher impregnated with gunpowder, the prepared fungus forms black amadou. Slices of the species Polyporus squamous and betulinus are pressed, rubbed with pumice, and formed into razor-strops. (See Polyporus squamous and betulinus Analosan, a mall-gam (Gr. malagma, that which it will combine, forms a pasty orfluid mass called an amalgam, and is, in fact, an alloy of mercury. (See Alloy, Gilding, Gold). The property which mercury possesses of dissolving gold is taken advantage of, in the various processes for extracting this metal from its powdered ore. The mercury is afterwards distilled off, leaving the gold in a pure form. Amalgam for electrical machines is made by adding tinfoil in small pieces to mercury, until they form a paste.

Amanta, ama-ni-ta, in Bot., a gen. of fungi.

AMANITA, ām-u-ni'-ta, in Bot., a gen. of fungi, thus named from Mount Amanus, in Cilicia, where thus manded from Module. The species have a close resemblance to some edible fungi, and are not unlike the common English mushroom. Amanita mescaria is a very poisonous kind, though the nativos of Kamtschatka are in the habit of eating it for the sake of its naturation of the sake. Kemtschatka are in the habit of eating it for the sake of its narcotic effects. It grows very abundantly in some parts of Kamtschatka, and is collected and dried by the natives. When steeped in the expressed juice of the whortleberry, it imparts to the liquid the intoxicating properties of strong wine, and when awallowed alone, it speedily produces drankenness. One or two small fungi are a common dose to cause a pleasant intoxication for a whole day. In too large doses it induces violent spasms.—Ref. Johnston's Chemistry of Common Life. Common Life.

AMARANTHACE & Sm-a-rau-thou-so-e, in Bot., the Amaranth ord. of dicotyledonous plants. There are 46 genera and 486 species, herbs or shrubs, nearly all natives of tropical regions.

#### American

A HARABHUS, "Send-rim" these, in Bot., the typical gen. of the net. ord. Americal access. Some of the species have bright-coloured persistent flewers, and have been introduced into this country as ornaments; garden plants. The best-known are A condition (Lovalies bleeding) and A. hypochondriums (Primes's

AMARYLIMACES, des.d-ril-li-dal-se-s, in Bot., the Amarylim ord, of monocotyledohous plants. There are 68 genera and 460 species, natives of many parts of the world, but most abundant at the Cape of Good Hope. Several of these plants have poisonous properties, and some yield excellent fibres.

AMARYLIES. dm-d-rill-lies in Bot.

perties, and some yield excellent fibres.

ANAUYLLIS, &m-d-ril'-lis, in Bot., the typical gen.
of the nat ord. Amaryllidacea. Several beautiful
garden and greenhouse plants are included in this
genuss? They are remarkable for their brilliant and
symmetrical flowers, which exhals a sweet perfume.

AMAUROSIS, &m-an-ro-is (Gr. amauros, obscure), in
Bath., is a blindness or obscurity of vision, proceeding
from a diseased state of the optic nerve, or of that
part of the brain in connection with it. It generally
somes on organization, with diumess or confusion of

part of the brain in connection with it. It generally comes on gradually, with dimness or confusion of sight, variations of colour, or the presence of floating objects called spectra. It is commonly occasioned by long-continued over-excitement of the organs of vision or by sudden exposure to a bright light, or it may proceed from a disordered state of the stomach. It is proceed from a disordered state of the stomach. It is also sometimes hereditary. It may be permanent, or only temporary. In a full habit, it is to be treated by depletion; in the weak, by tonics and alterstives. Counter-irritants are also to be used; as, blisters behind the ears, or a seton in the back of the neck, or on the temples.

AMAZON, ām'-ā-zon (Gr. a, without; mazos, the breast), a fabulous female warrior, famous for valour, and said to be an inhabitant of the Caucasus; so called from their cutting off the right breast to give greater freedom in the use of the bow. The ancients mention three nations of female warriors. The Asiatic Amazons, the Scythian Amazons, and the African Amazons, which last were annihilated by Hercules.

Ambassadon, dm-bis'-si-dor (Fr. ambassadeur), in Diplom, signifies an agent sont by one sovereign power to another to treat on affairs of state and matters affect ing the interests of his country. Ambassadors are of wwo kinds; those that reside regularly at the court to which they are accredited, and those that are sent there on a apecial occasion, the latter being styled "ambassa-dors extraordinary." The duties of an ambassador are to watch over the interests of his own country at the foreign court; to negotiate for treaties and alliances; to enforce the performance of existing treaties, to protect his countrymen from injury orunjustice, and to aid them in case of need. Ambassadors, together with their families and suites, enjoy perfect security of person, and their property is protected against all legal process. They are usually, also, exempted from custom duties and from all taxes, and are allowed the

free exercise of their religion.

AMBER, am'.ber (Fr. ambre, Sp. ambar, Gr. elektron), a resinous mineral solid, of a fine yellow colour, which, on being rubbed, becomes strongly electric. It has given its name to the science of electricity, being the first substance which was found to possess being the first substance which was found to possess such properties. It is much used for jewellery and pipe mouthpieces. Dissolved in chloroform, it forms one of the best photographic varnishes. It is found abundantly or the shores of the Baltic, and, occasionally, in Greenland, England, Italy, Spain, Sicily, Siberia, and Chins. It is supposed to be a fousil gum or resin, from its constituents and properties, and from containing the bodies of insects inclosed in its mass.

AMBRE, ACID OF. (See SUCCINIC ACID.)
AMBRECRIS, dm'-bor-gris (Fr. ambre, ambre; gris grey).-Ambergris is a morbid secretion of the spern whale, much used in persumery, found fleating on the sea, or deposited on the coast. Although possessed of little scent, it imparts a delicate occur to other perfumes.

AMBORIA, dm-bro'-she-d (Gr. a, not, and brotos, marrial), in Heathen Myth., was the name given to the food of the gods, as distinguished from nectar, which was their drink. It was supposed to endow them with eternal youth and immartality; and mortals who

## Americanisma

were permitted to partake of it were in some measure assimilated to the gods, receiving an increase of strength and beauty. Ambrosis was also the name of nettein festivals, observed in Greece in honour of Bacchus,

during the vintage.

ARBEY, Zm. bye (Lat. armarium, a storehouse, looker, aupboard), the piace where the arms, piste, vessels, and everything which belonged to housekeeping.

were kept.

AMBULANCE, am'-bu-lans (Lat. ambulo, I walk), a term derived from the French, and applied to those moving hospitals which accompany every army, or division of an army, in the field, furnished with all the requisites for the succour of the sick or wounded. It is also applied to the waggons or carts provided for conveying the wounded from the field of battle. The latter are termed by the French ambulances volantes, and were first introduced in 1793, by Larrey, the celebrated French military surgeon. During the Crimean war, ambulances mounted on the pack-saddles of mules were used, and improved ambulance-carts were con-

structed and sent out to the Crimes.

AMBUSCADE, dem'-bus-kaid, in Mil., a term derived from the Italian imboscare, to lie in bushes or concealed. and signifying the lying in wait or in concealment of a body of troops to attack an enemy unawares.

AMBLANCHIER, am-e-lan' she-er, in Bot, a gen. of plants belonging to the sub-ord. Sanguisorbea, of the nat. ord. Rosacea. The species A. canadensis is a native of the arctic regions, and its fruit, called the shad-berry, or service-berry, is used for mixing with pemican.

AMEN, ai'-men', a word derived from the Hebrew, and signifying properly, firm of faithful. In the beginning of a sentence, it is used by way of emphasis, as, verify, or truly; and at the end, especially of prayers or hymns, it signifies so be it, or so let it be.

AMENDE HONORABLE, a-mand' hon-o-rab! (Fr.), a kind of punishment inflicted in France upon traitors, particides, or sacrilegious persons. It was thus inflicted: the offender being delivered into the hands of the hangman, he was stripped of his shirt, and a rope put about his neck, and a taper in his hand; he was then led into court, where he was obliged to beg pardon of God, the king, the court, and his country. Sometimes the punishment ended here; but sometimes it was only a prelude to death or banishment to the cellars. ment to the galleys.

AMENDMENT, d-mend!-ment (Lat. emendatio, an emendation, or strengthening), in Law, is the correction of an error in the process, which may be amended, even after judgment. Such correction cannot be made after judgment. Such correction cannot be made where the error lies in giving the judgment itself. In such case, it is not amendable, but the judgment may be reversed or corrected by a majority of the judges of a court of error, composed of the judges of the different courts, or such of them as can attend, upon a writ of error sued out by the party aggrieved by the judgment.

AMENDMENT, in Pol. (See BILL IN PARLIAMENT.) AMENTACEOUS, d-men-tui'-se-us, in Bot., a term applied to those plants which bear catkins (see AMEN-

applied to those plants which near cashing the Analytical Tun), as the oak, willow, poplar, hirch, and walnut.

AMENTUM, or CATKIN, a-men'-tun, in Bot., a kind of spike, which only bears barren flowers, that is, only stamens or pistils; these being separated from each other by bracts. The whole amentum usually falls off in one piece, soon after flowering or fruiting. The species of willow called palm in England has very fine catkins, and the young branches bearing them were formerly used to deck churches on Palm Sunday.

AMERCIAMENT, deservainment (lat. americamen-tum), in Law, signifies the pecuniary pfinishment of an offender against the queen, or lord of a franchise, in her or his court, that is found to be in miscricordia, i.e., to have offended, and to stand at the mercy of the ones on the deservation of the court of the queen or lord. It was the usual punishment inflicted by the court leet for public nuisances committed within its jurisdiction; but as these courts are seldom held, and their powers have fallen into desuetude, in consequence of the ready justice afforded by courts of law, unerciaments may be now considered as obsolete.

AXENICANISMS, d.mer.-i.co.-nime, words or phrases used in the United States of America, but not current in

## Amethyat

ral writings, the works of standard American authors containing very few of them. The number of new words introduced in America is comparatively small. The Americanisms are chiefly words or phrases used in a different sense from that which they have in England;

different sense from that which they have in England; as, I guess or recken, for I think or suppose. In some instances, words that have become obsolete, or whose meanings have changed in England, are preserved in America, and fall moder this class.

AMERICAL, \*aw'-e-thiet\* (Lat. \*amethystus), a var. of crystallized quarts, having a violet tint, due to a small quantity of manganese. The most beautiful specimens are obtained from Ceylon, India, and Persia. It is also found near Cork, in Saxony, and in Transylvania. The Oriental amethyst is a purple variety of the sapphire, and consists of alumina, with a small portion of oxide of iron.

of iron.

Amı. (See AMY.)

AMILANCE, OF AMECABLE, NUMBERS, ām'-i-ka-bel, in Arith., are those which are mutually equal to the sum of each other's aliquot parts. Thus, 220 and 284 are amicable numbers: the aliquot parts of 220 are, 1, 2, 4, 5, 16, 11, 20, 22, 44, 55, 110, which are equal to 284; and those of 284 are 1, 2, 4, 71, 142 = 220.

AMILANEUS, ām-i-ām'-thus, a fine variety of asbestos.

(See ASBESTOS.)

ARICUS CURIR, a-mi'-kusku'-ri-s.—It not unfrequently appens that a counsel, not retained in a cause before court, mentions some case within his knowledge which has been decided, bearing on the point under discussion, or makes a suggestion in aid of the argu-ment. He is then styled amicus curies, or friend of the

AMIDES, am'-ides. — The amides are compounds formed from ammonia by the substitution of one or more equivalents of a metalloid, a halogen, or an acid base, for one or more equivalents of the

hydrogen.

 $N \begin{cases} C_a H_a O_a \text{ (acetyl)} \\ H \\ H \end{cases}$ Ammonia, Trichloramide, Diniodamide, и{Н N Cl (H lãi H

Inorganic amides are not very numerous; but the number of acid bases in organic chemistry being almost endless, the organic amides are correspond-

AMIDOREM, a.mid. o.jen, a hypothetic base, containing two equivalents of hydrogen to one of taxches.

nitrogen. AMINES, am'-ines. - The amines are compounds formed from ammonis, in the same way as the amides, by the substitution of a metal or salifiable compound radicle.

Ammonia Potassamine. Trigino omine. Ethylamine N Zn N C.H. (ethyl) N {H H n { H

Metallic amines are less numerous than those formed

from organic bases. (See AMIDES.)
AMMON, or AMUN, am'-mon, in Heathen Myth., was
the name of a celebrated deity of the Egyptiaus, who the name of a constraint and the help and, which was considered by the Greeks to be synonymous with their Jupiter. His chief city was Thebes, which was thence called the city of Ammon (No-Ammon, in the Old Testament), and by the Greeks Diospolis, or city of Jupiter. In the temples of the holy city he is represented as sitting upon a throne, holding the symbols of life and power, and wearing a crown with a peculiar ornament of two feathers and a long band behind, falling down to his feet. He is also sometimes represented with a ram's head, or with the head of a ram and the

with a ram's head, or with the head of a ram and the body of a sphinx.

ARMONIA, VOLATILE ALKALI, ARTMAL ALKALI, or STIELTS OF HARTHORN, dm-mo'-ni-a. — Ammonia is a gaseous compound, possessing the properties of the alkalies proper,—potash and soda. It was frat isolated by Priestley, in the year 1774, who named it alkaline air. He procured it from sal-ammoniae; whence its name. By submitting it to heat, he found it to consist of three parts of hydrogen to one of nitrogen. It is difficult to form it by the direct union of those masses that wherever asseems hydrogen and sitrogen gases; but wherever asseemt hydrogen and sitrogen are eliminated by any chemical action, a portion of ammonia is always found in the resulting compound.

## Ammonia Acua

During the decomposition of water containing air by

During the decomposition of water containing air by the electric current, a small quantity of ammonia is formed; also when a mass of moistened iron filings is exposed to the sir; but it is formed in the greatest quantities when introgenous organic matter patrelles, or is submitted to destructive distillation. Ammonia is also formed during the distillation of coal in gas-works, the ammoniagal liquor produced in this way being the great source of ammonia for commercial purposes. Formerly it was made from the ammoniacal liquor produced in the manufacture of bone-black. It is generally prepared in the laboratory by the action of caustic lime on some salt of ammonia.

NH\_O+CaO = CaCl+HO+NH\_3.

The gas evolved is collected over instrucy, or else by displacement, as it is gradually absorbed by yater. Ammonia is easily liquefied by the combined action of a pressure of 63 atmospheres and a temperature of 32°. By submitting this liquid to the action of solid carbonic acid, solid ammonia is produced. Ammonia is one not support either combustion or life, and inflames with difficulty. It is decomposed into its elements by passing through it a series of electric sparks, or by transmitting a current of it through a red-hot tube. Ammonia is readily absorbed by water, which takes up 670 times its own volume of the gas, forming the liquor ammonias of the chemist, or liquid ammonia, as it is generally improperly called. Ammonia is found in very small quantities in the sir, being evolved during the decomposition of most animal substances, more especially improperly called. Ammonia is found in very small quantities in the sir, being evolved during the decomposition of most animal substances, more especially excrements and urine. Ammonia forms an infinite number of salts with the different soids, most of the similar in their properties to the corresponding salts of potash and soda. AMMONIA, ACRIATE OF, or SPIRIT OF MINDEREUS, used in medicine as a refrigerant and disphoratio.

AMMONIA, CARBONATE OF .- The sesqui-carbonate of ammonis forms the smelling-salts of the chemist's shop, generally called Preston salts. Solution of carbonate of ammonia is sometimes used as an emetic. It is also used in the manufacture of unfermented bread. It is used in medicine as a stimulant.

AMMONIA, NITRATE OF.—This salt is used in the laboratory for the production of nitrous oxide, or laughing-gas. The crystals are melted in a retort, at a laughing gas. The crystals are melted in a retort, at a gentle heat, nitrous oxide being given off, and water remaining behind.

 $NH_{\bullet}ONO_{\bullet} = 2NO + 4HO.$ 

AMMONIA, SULPHATE OF .- This salt, which is much used as a cereal manure, is obtained in great quantities by neutralizing bone- or gas-liquor with sulphuric acid, evaporating and crystallizing.

Amountac, Gun.—This substance, which is often confused with the salts of ammonia, is a concrete juice,

procured from at unknown tree growing in Persis and Abyssinia. It occurs in agglutinated masses called Abyssinia. It occurs in agglutinated masses called tears, and is used in medicine as a stimulant and expectorant. When softened with vinegar, it forms a plaster, which has been used for the last 2,000 years, and has apprived all changes in medicine. and has survived all changes in medicine.

Ammoniac, Sal. (See Ammonium, Chloride or.)
Ammoniacum, dm'-mo-ni-a-kum, a fetid gum-resin
used in Med. It exudes from the stem of an umbelliferous plant known to botanists as Dorema ammonia-cum, which grows in Persis and the adjacent parts of Asia. It is occasionally prescribed as an expectorant, and is applied externally to promote the absorption of tumours and chronic swellings of the joints.

AMMONIE AQUA, AMMONIA (LIQUID), AMMONIE (LIQUOE), AMMONIA (SOLUTION OF).—The solution of gaseous ammonia in water is called by all the above gaseous ammonis in water is called by all the above names. As stated under Ammonia, water absorbe 670 times its volume of ammoniacal gas, forming a colourless transparent liquid, having a characteristic pungent smell, a burning caustic taste, and a strong alkaline reaction. At its greatest strength its specific gravity is '850, and it can only be kept in closely-stoppered bottles. It is made by passing the gast through distilled water kept near freezing-point by means of ice. It is of great use in the laboratory as a re-agent, dissolving many oxides and salts insoluble in water. It is employed in medicina as a stimulant. There are two degrees of strength used,—the liquor ammoniss fortior, of '850; and the ordinary liquor ammoniss, or spirits of hartshorn, of '960. Mixed with

56

# Aumonia

oil, with which it forms a soon, it is used as a sub-facient, under the hams of easy-liminest.

Authority, Section offs, in Concht, a gen, of fossil shells allied to the Hilloy year. Familian: In chapte they resemble it read a lock, — element later same, from their supposed fileness to the horse apon the status of Jupiter America. Having, also, very much the sp-pearance of a delied analys, they are religious cormed petrified analys. They are found plentifully in the



colite formations, and are so abundant in some parts of Burgundy, that the roads are paved with them. The animal that inhabited this shell was provided with airsees, by means of which it could rise or sink in the water; and its shelly covering, necessarily delicate in order to float, was made strong enough to bear the pressure of great depths by its tubular form and inernal ribs or supports.

Aumonium.—The existence of a hypothetic com-pound metal called aumonium, and having the consti-tution NH, has been assumed as the only method of explaining the perfect analogy that exists between the saits of ammonis and those of the various metals. An equivalent of ammonia united to an equivalent of water is supposed to form the oxide of this metal, NH, + HO is supposed to form the order of the inets, Ma-Tho (NH<sub>2</sub>)O, corresponding to potassa, the oxide of potassium KO. The following comparison between the compounds of ammonis and those of other metals will show the working of this theory at a glance.

KMetak	(NH.)Metal.
NaOOride.	(NH.)OOxide.
AgCiChloride.	(NH.)ClChloride.
LilIodide,	(NH.)O.NONitrate. (NH.)O.SOSulphate.
CaO, NO,Nitrate.	(NH.)O, NONitrate.
BaO, SO, Sulphate.	(NH <sub>4</sub> )O, SO <sub>4</sub> Sulphate.

Hato, NO<sub>8</sub>...Suiphate. '(NH<sub>4</sub>)O<sub>5</sub>SO<sub>8</sub>...Suiphate. The theory of the existence of a compound metal is borne out not only by analogy, but by actual experiment. If a few globules of mercury are immersed in a solution of calcinde of potentium, and an electric current be passed through them, the mercury gradually swells up into a pasty mass, which experiment has proved to be an amagem of mercury and potassium. If chloride of ammonium be substituted, the same effect takes place, the only difference being, that the bulk of the intercury is much more increased, and at last floats on the solution, from its lightness. The formation of this simalgam seems not only to demonstrate the existence of ammonium, but also to show that it is metal, non-metallic amalgams being unknown. When thrown into water, these simalgams form solutions of potash and ammonia respectively, with the evolution of hydrogen. of hydrogen.

ARYOSTUE, CRICKINS OF.—This salt is ordinarily called salt-ampointed, or muriate of ammonia. It is made extensively by neutralising bone-liquor or gasliquor with hydrochlorio soud, symporating, crystalizing, and subliming. It was formerly manufactured by subliming the soot produced by a mixture of coal, salt, animal matter, and clay. It was first made from the soot produced by burning camely daing in Libya, near the temple of Jupiter Ammon, whence its chime. It is much used in the arts, more especially in timing iron, copper, and bress. It may be formed directly by the union of dry ammonia and chlorine.

# Amphibia

Acceptable, Ionne ov, du-no ni-ne. This salt is much used in photography for iodising collodies, on account of its great solubility in alcohol. Its manu-actomes way difficult; it should, therefore, be bought of a respectable chemist.

fecture is very difficult; it should, therefore, he bought of a respectable chemist.

ARRIFORM of the chemist.

ARRIFORM of the chemist of the chemist of the chemists of the fath

father.

America, or America, in allowifery, is the membranous bag in which the featus is inclosed in the womb, and which also contains the liquor americ. It is composed of three membranes; an outer, or flamentous one, called decides; a middle, named the chorion; and an inner, called the america.

Amonum, Amorama, in Both, a gen, or plants belonging to the nat. ord. Zimpibersees, the Ginger family. Several species have arountic seeds, which are used medicinally and as pieces in many parts of the world. A melegueis is a native of Western Africa, and yields the so-called grains of Paradise, or Guinea pepper, used in this country in vaterinary medicine, and yields the so-called grains of Paradles, or Guines pepper, used in this country in veterinary medicine, and for giving pungoncy to beer, wine, spirits, and tinegar. Most of the fruits called cardamoms, so largely employed in medicine as stimulants, are produced by plants included in this genne; thus, d. cordamoma yields the round cardamoms; d. maximum, both the large and small round China cardamoms.

A MORGING in Ret the heatened indice a

both the large and small round China cardamons.

AMORPUA, & mor'fo, in Bot., the bastard indigo, a
gen, of plants belonging to the nat. ord. Leguminoceae.
The typical species, & fraticose, is a native of South
Carolina, and is cultivated in English gardens. Its
flower is purple or violet, and very irregular, the corolla
wanting both wings and keel; its leafis very dark green.
The root, when peeled, is sometimes chewedas a remedy
for toothache. A blue dye-stuff resembling indigo, but
much inferior, may be obtained from this plant: hence
the common name for the genus.

AMORPHOUS, &-mon'fus (Gr. 6, without, morphe.

Amonrhous, d-mort-graus, without, morphe, form), in Chem., substances are said to be amorphous when they do not assume any crystalline form.
Amonrhanton, d-mort-indi-shue (Lat. amorthanto), in Law, an alienation of lands or tenements in mortmain,

vis., to say corporation or faternity and their successors. (See MORTHAIN.)

AMPELINE E., despectivedee (Gr. ampelos, vine), in Bot., a name given by some botanists to the Vine ord. (See VITACES.)

AMPRIORES, 82-pc-lop'-sie, in Bot., a gen. of plants belonging to the nat. ord. Vitaoes, the Vine fam. The species constitute the climbing shrubs called Virginian crespers. They are remarkable for the crimson tints assumed by their foliage in autumn, and for their ourlously formed tendrils.

ARTRIBIA, Institute (Gr. creph), both, and bios, life), in Zool., an ord. of the class of Reptiles. In ordinary language, the large lifely, in Zoul., an ord. of the class of Reptiles. In ordinary language, the term amphibious has been applied:—to animals such as frog, which at one period of their existence are squatio, breathing by means of sills, and which at another period of their life respire air, and are frequently on land; to animals such as seals, which, sithough breathing by means of lung, are yet capable of remaining under water for some time; to various terrestrial salmals, we have the hippopotamus, which frequent an aquatic medium. But if the term amphibious be taken in its literal sense, viz. as denoting the power of living both on land or in the water indifferently, it will be found to apply to only four genera of batrachism reptiles, which, according to Curier, are the only known truly simplificious arimass, imamuch as they aline possess simultaneously, both lungs and gills. These salmals are the Axolodia, the Menobranchi, and

the Sircus, inhabiting the American raves and the Protects, whose ballets is the streams which connect some these in O Hungary. In the system of Lineary Hungary. In the cretical of Linuxus the amphibias comprehended the whole of the ampair now inverse as reptiles; such as accepting, frogs, sortaines, and linesh, and even the cambiagnous subsets but according to the mest philosophical of the factor saturation, the term amphibia has been rectified to that order of reptiles called Battachians; for this resson, that these animals breathe by means of gills in their satisfact or taspots condition, and afferwards soquire lungs, and respire sir on assuming their perfect form as reptiles.—Ref. Todd's Cycloposided American and Physiology; English Cycloposides, "Natural History." (See Battackians, Taos, Sieres, Batamarius, Paperus.)

Ampariants, des Houge de toute silicate of alumina and magnatis, often coloured black or green by the substitution of exide of iron for the latter.

Ampariantour, des Jude of iron for the latter.

and magnesia, often coloured black or green by the substitution of a ride of iron for the latter.

Anxingtiour, he file eve-o-je (Gr. amphibolia, doubt, and logos, discourse), is a term used to denote withress managerithe if two different interpretations, arising wither from the order of the phrase, or from the ambignous meaning of a word. The answers of the mabignous meaning of a word. The answers of the oracles were trequently of this nature, as in that received by Pyrikus from the oracle,—Aio te Hacida Romanes miscore passe, where the meaning may be office that you will conquer the Romans, or that the Romans will conquer you.

Americana, in the broke (Gr. capid, both, about, n both sides, and braches, short), in Peetry, the name of a fact of three syllables, of which the middle one is long, and the first and last short.

Americana, in the first and last short.

Americana, in the first and last short.

Americana, in the first and last short.

In the short of three syllables, of which the middle one is long, and the first of the great group is the possession of a stem increasing only at the circumference. The sanklibrya of Endlicher therefore correspond with the Mencotyletlones of Justice, and with the three divisions Enlargens, and Dictyopens, of Laster.

Agreements Courses, En file 4 on it, a politico-religious court of ancient Greece, said to have been founded by and to have taken its name from, Amphic-tyon, son of Deucalion; but, according to Strabo, it was instituted by Acrisius, king of Arges. It was pro-bably at first a religious assembly, but it subsequently pany at first a religious assembly, but it subsequently asseme to be of great political importance. It was composed of two representatives from each of twelve Greek states, who met twice a year for the purpose of protecting their common interests, and preserving their religious institutions. As individual states became powerful, and strove for the first rank, the influence of this council decined, and in the time of Demosthenes it had essed to primare of wearast.

A 34

the magnificent building that in the works of the funtorial different. Therefore admires, and will long admire, the await preasting of the amulitheatre of Titue, which so well deserved the epithes of Colossal. It was a neithing of an elliptic figure. But has in length and set in breachin, founded on four-corrections, and rising, with four successive orders of architecture, to the suggest of 146 (187) feet. The orderies of the cities was encrusted with marble, and decorated with cities. The slopes of the wast edocumentated blumes abstingle were filled and surrounded withheatr or sighty rows of seats, of marble likewise, novered with cuspium, and opable of receiving with east four-correct when any operature. Sixty-four vessioness (for by that name the doors were very apity distinguished) yourselforthe immense multitude; and the entrance, passages, and staircases were contrived with suck arquisite skill, that each person, whether of the senatural, spacetrian, or plebeian order, arrived at his destined place without treathle or confusion. Nothing was sunsess which many respect could be subservient to the convenience and pleasure of the spectators. They were protected from the sun and rain by an ample emory, consciously drawn over their heads. The air was notificable refreshed by the playing of fountains, and protucely impregnated by the grateful seem of secondaries, the the centre of the earth like the garden of the Resperiets, and with the finest sand, and successivity assumed the most different forms. At one moment it accurate to rise out of the earth like the garden of the Resperiets, and was afterwards broken into the rocks and caverns of thrace. The substructure price and excessed to rise out of the earth like the garden of the fleeperiets, and was afterwards broken into the stocks and caverns of thrace. The substructure with armed weakle and supplies and veploushed with the monature of the deep. In the decoration of these scenes the Roman superced and published with the monature of the amperied and very of th displayed their wealth and liberality; and we read on various occasions that the whole furniture of the amvarious occasions that the whole furniture of the amphitheatre consisted either of silver, or of gold, or of amber. The post who describes the games of Darians in the character of a shepherd, attracted to the capital by the fame of their magnificence, affirms that the nets designed as a defence against the wild beasts were of gold wire; that the portions were gilded, and that the belt, or circle which divided the several ranks of spectators from each offer, was studded with a precious mosaic of beautiful stemes." As it is impossible by a more weak description to convey as active. powerful, and strove for the first rank, the influence of this council declined, and in the time of Demonthenes is had onesed to command respect.

ARTHURACUE, 2m-first-a-sec (Gr. amphi, and makros, long), in Poetry, the amen of a foot of three syllables, of which the midfle one is short, and the first and last long.

ARTHURACUE, 2m-first-kn, in Bot., an indehiscent many-called fruit like that of the Bachab.

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classes, every one oh would conduct Event the presses which would conduct then so the place seeigned by the laws of the samplellnester to his rask and condi-tion. Those persons whose dignity entitled them to a seat on the podesse passed counts the statecase A, and ascenited to the data ways which opened upon that dis-tinguished position. Those of the eque-tries order, or of such rank as entitled them to a seat in the division of benches acts above the medium ascended by the

sext above the pedium, seconded by the

AMPRICATES AT VENORAL WAS REVENED IN THE After that time it was compled as a fertiress by the counts of Provence, who enstained a number of attacks therein, and built a church and a number of attacks therein, and built a church and a paince on the areas. In 1939 Francis I, ordered I to be cleared. It this widdle of the 18th century it was complete by a number of fusion lovels, all of which have disappeared. The modern inhabitants of Nigmes use the arms first suit-flights. We have in England several rections of the Edman amphification. Mean Sandwickle, in Even. Given is an inhabitants of Nigmes has the stems for sub-fight. We have in England several vestiges of cell found amphitheatres. Near Sandwich, in Kost, deere is en elliptical excavation, with hencies of time, and at Caerlou, in Monmoutheine, as well as other places, there are distinct traces of them haveuries addings of the Romans Empire; Smith's Dictioning of Greek and Roman Antiquities.

Asympton a ran in the adviced Languages, deports that

Amphore

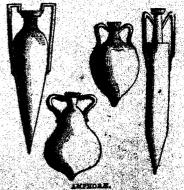
Roma Antiquities.

Aspective arms, in the stricel imaginage, deputes that part of a theatre which rises above the top tier of boxes. It is also the name of an opartiment appropriated to public loctures and discourses, affect with sease rising one above another, either in a semisimple form or encompassing the whole room like the sease of an ancient amphitheatre.

SECTIONAL YERW OF AMPRICEMATER.

staircase B, while the other classes made use of the staircase C, which gave access to the floor of the internaciate landing or corridor, E, and then either ascended by the staircase F to the second division of benches, or by the staircase D to the second exterior corridor, and thence by the staircase G to the third division of benches, and higher still by other staircases in a different direction, to the third exterior corridor, which communicated with the uppermost division of benches. These different staircases were respectively opposite to different staircases are propositely opposited. The lower story stories of open accedes and an attic. The lower story is very lotter, with tall and narrow arches, separated by buttresses of two projections in the Gothie atyle, crowned by a Tuestan capital. A regular carisbisture encircles the insiding, and breaks in projection over every buttress. The exterior circuit consists of sitty open arches, of which four, at the extremities of the diameters, are ornamented with rediments: these were formerly the grand entrances. The vicestindes of this delibrated edilibe are so inuacrons that it is wonderful it should remain to well preserved as we find it at the present day. In 473 the Vingothe converted it into a fortress. In 730 it was taken by the

ANTHORA, dm'-fo-rd (Gr. amphoreus, from amphi,



on both sides, and paers, I carry), in Astiq., is the name of a vessel commonly of satheswere, so called bearing, so called

# Amplexicaul

from having a handle or ear on each side of the neck. Its form and size varied, but it was usually long and narrow, frequently about 2 or 24 feet in height, by about 6 inches in diameter, terminating at the lower extremity almost in a point, to admit of insertion into a stand or the sarth, in order to keep it apright. They were generally used for preserving oil, wine, honey, grapes, or other fruits; but also as sinerary urns. Homer mentions emphores both of gold and stone, and in later times glass amphores were not uncommon. Earther, amphores of the Roman period have occasionally been found in England. The amphora was also a measure of capacity among the Greeks and Romans. The Roman amphora contained 48 sextaries, or about I gallons 1 pind English wine measure; the Attio or Greecian about one third more. Among the Romans the amphora was also a dry measure, containing about 5 bushels. The Venetians still have a liquid measure of this name, containing about 16 quarts.—Bgf. from having a handle or ear on each side of the neck

ing about 3 bushels. The Venetisms still have a liquid measure of this name, containing about 16 quarts. Ref. Smith's Dictionary of Greek and Roman Antiquities. ANTERNICALL, in pleaf-i-kani (Lat. amplect; to embrace, condie, a stem), in Bot., a term applied to a leaf which is enlarged at its base, so as to clasp the atem from which it springs, as in fool's parsley.

ANTIGEROUS, in Surg., is a term applied to denote the operation of cutting off a limb or some part of the body. The human frame is so constituted that if one member be diseased, the whole body suffers with it; and frequently the life of an individual may depend upon the removal of an injured or diseased member. The ancients, while they saw the necessity of cutting off a removal of an injured or diseased member. The au-cients, while they saw the necessity of cutting off a limb, shrenk from the operation with dismay, for they knew of no means of stopping the hemorrhage but red-hot irone and boiling oil or resin; and hence, be-sides the suffering entailed upon the patient, their operations were seldom successful. The advance of modern surgery is here very marked, not only in the improved methods and appliances for operating; but, from their increased knowledge of the human body, surgeons are now able to determine with far greater surgeous are now and to determine with lar greater accuracy when an operation is necessary, or, by a minor operation, are able frequently to save a limb, little or at all impaired, which even half a century ago would have been ruthlessly sacrificed; while the recent introduction of amenthetics has been of incitionable value to the patient. An amountation may timable raine to the patient. An amputation may be performed by what is termed the circular, the double-dap, or the single-dap operation. In proceeding to amputate, the patient is first placed in a convenient position, and the main artery is compressed by the tourniquet (see Tounniquer) or by the hand of a skilled assistant. The circular operation is performed by first detaching the skin a short distance below where the amputation is to be made. It is then drawn upwards and the muscles divided down to the bone, which is then sawn through. The arteries are then seized with a small forceps, drawn slightly out, and tied with a thread, after which the skin is brought over the wound, and either stitched or held together by strips of adhe-sive plaster. The double-flap operation differs from the above, in that the skin and muscles are out down the above, in that the skin and muscles are cut down in a slanting manner, on opposite sides, so as to form two flaps, which are then drawn up, and the knife carried round the bone, dividing any flesh that may still be adhering to it; after which the surgeon saws the bone. It is objected to this method, that it makes a greater wound, and that the arteries, from being cut obliquely, will be less securely tied; but it is in favour with many, who maintain that there is little force in these objections, and that they are more than compensate the characterion afforded by the these objections, and the protection afforded by the flaps to the hone. The single-flap operation is seldom resorted to, unless where a portion of the limb is destroyed on one side, and it becomes necessary to take the flap from the apposite side.—Ref. Farguson's

the flap from the appears see.—Any.

Manual of Surgery.

Anvusn; der selet (Arele, Lorenlet, something suspended), is an object hang round the neck, or carried otherwise about the parson, see charm from accidents, diseases, witchcraft, inc. They are usually atones, metals, or plants; sometimes sentences or words, stranged in a particular order. They are much used from your order of the services of America and Africa, the Araba, Turks, &c. From 60

# Amylic Alcohol

the Chaldeans and Egyptians they passed to Greece and Rome; and that they prevaied in the early. Christian church, we learn from the frequent denunciations against them. Even at the present time, in some parts of England, tath in the virtue of certain channs has not entirely ceased.

Amt, at wi (Let, amicus, friend). In Law, a process there is sugar the per tiread (not the guardan) ming for an explain on infant, or for a married woman, neither of whom can personally institute a still. The next friend is liable for costs if an adverse decision become to against the party for whom he acts. Alien cany is a foreigner here, subject to some prince in friendelip with us. (See ALTER.)

Ammedam, or Durraons, imi-ig-dai'-ie-s, in Bot, sub-ord, of the net, ord. Rosesces. This division includes most of our stone-fruit trees, is the amount the plum, and the cherry. The seeds, flowers, leaves, and young shoots of many of the Amyodales, when moistened with water, yield hydrocyanis, or, as it is commonly termed, prussic nold. Their barks have generally astringent and febrifugal properties, and relieves By the action of the sikelies amygdale, an almond.)

Amyodalun, dis-ig-dai-les (Gr. amygdale, almond), a gen. of plants belonging to the nat. ord. Bosaceæ. The typical species is Asygdales comments, the almond-tree, of which there are two varieties; namely, A. communis, var. duleis, yielding sweet almonds, and A. communis, var. duleis, yielding sweet almonds, and other parts of

munis, var. auccus, yielding aweet amonds, and A. com-munis, var. amara, which produces bitter almonds. The almond-tree grows wild in Syris and other parts of Asia, also in northern Africa, and is extensively cul-tivated in the southern parts of Europe. In England it is grown more for the sake of its early spring blossoms than for its fruit, which seldom comes to perfection. A fixed oil, commonly known as oil of almonds, is obtained by expression from sweet almonds, and the residue, which contains gum, regetable albumen, and emulsion, is sold under the name of almond-powder. Bitter almonds, when merely subjected to pressure, yield a similar oil. They also contain emulsion, and, in addition to this and the other constituents of sweet almonds, a nitrogenous substance, called amygdalin. When bitter almonds are moistened with water, the When bitter almonds are moistened with water, the emulsion and amygdalin mutually re-act upon each other, and form a poisonous volatile oil, which is known as the essential oil of bitter almonds, and which is used, in small quantities, for flavouring custards and pastry, also for scenting soaps. Amygdalus persica is the peach-tree of our gardens, and a variety of the same species produces the nectarine. Peach-blossoms have been employed in medicine as a vermituge, and the kernel of the fruit may be used for the same purposes as the bitter almond. the same purposes as the bitter almond.

the same purposes as the bitter aimond.

ANYE, des-4. (C<sub>2</sub>, H<sub>1</sub>), a compound radicle, discovered by Frankland, by acting on iodide of amylwith zinc. It is an oily liquid, boiling at 311', and homologous with methyl, ethyl, &c. Like them, it forms an oxide or other, and a hydrated oxide, or alcohol.

 $C_{16}H_{11} \}$  O<sub>s</sub>, amylic sleohol, is formed during the distillation of common sleehol from grain or potatoes by the decomposition of the starch contained in them; hence its name. The fusel, or fousel oil of potato-spirit, consists almost entirely of amylic alcohol. It is this substance that gives to many spirits their noxious tons attended that gives to many spirits their notations properties. It may be easily recognized by rubbing a few drops of the spirit on the hands; the vinous alcohol and water evaporate first, leaving the amplies closed behind, which is easily recognized by its characteristic odour. It gives to spirits a flery acrid taste, and is most commonly found in inferior run. taste, and is most commonly found in inferior run. When distilled with dilute sulphuric acid and bi-chromate of potasis, it yields raiseric acid (which see), the salts of which are much used in medicine. Heated with dry phosphoric acid, a hydrocarbon, called amylene, is formed, which has been much used as an abusthetic.

AMYLANINE. (See Americand Autl.) AMYLERE. (See AMYL.) AMYIAC ALCOHOL. (See AMYL.)

60

# Amyridaces

AMYRIDACER, dm'-i-ri-dai -se-e, in Bot., the Myrrh AMMEDACRE, dm'.i-ri-dai/se-s, in Bot, the Myrrh and Frankineense ord. There are about 50 species known, all natives of tropical regions. The most important are described under the heads of the genera to which they belong.

AMMEDACRE, dm'.i-ris, in Bot., a gen. of tropical plants belonging to the nat. ord. Amyridaces. Many species yield fragrant resine, and A. balsamysra is said to furnish, besides, a kind of rosewood.

AMA, si'na, a'na, is a termination added to the names of semurable men to designate collections of their

of remarkable men, to designate collections of their of remarkable men, to designate collections of their sayings, extracts from their writings, or, generally, any particulars concerning them. It is put in the form of the Latin neuter plural, and signifies properly matters or things about, or relating to, the person to whose pame it is annexed.—*Examples*: Johnsonians, Walpolians.—*Ana. 3d.*, or *d.*, in medical prescriptions, denotes that an equal quantity of each of the ingredients is to be taken. dients is to be taken.

ANABAPTISTS, cin-a-büp'-bists (Gr. ana, again, and baptize, I baptize), a term applied generally to such Christians as hold that baptism is only to be administered to adults, and insist upon the necessity of a second baptism to all who join their communion. The name, however, is properly applied to a sect of reli-gions fanatics that sprang up in Germany soon after the commencement of the Reformation. Not only did they insist upon re-baptism, but they pretended to divine revelations, and held many absurd or dangerous heresies, as independence of all civil authority, equality of rank, community of goods, plurality of wires, &c. The leader of this sect was one Thomas wives, &c. The leader of this sect was one Thomas Münzer, a pastor in Alstedt, in Thuringia, who, after having adopted the principles of the Reformation, turned aside to these beresies. He subsequently went to Wuldshut, on the borders of Switzerland, which became the chief seat of the body; whence their doctrines spread through Switzerland, Whestphalia, Holstein, and the Netherlands, in spite of the severest persecutions. The rising of the peasantry in Francina, in 1525, fell in with their views, and, in a battle which was fought soon after, Münzer was taken prisoner and slain. The sact, however, still continued to gain ground, and, in 1632, a body of them, under John Matthias, a baker, of Haerlem, and John Boccoldt, a tailor of Leyden, surprised and took the city of Münster. Here they gave themselves up to the greatest extravagances, and Matthias proclaimed himself king of Mount Zion, the name given to Münster. Matthiss was out off in a sally which he headed against the bishop of Münster's troops, and was sucagainst the bishop of Münster's troops, and was succeeded by Boccoldt. At length, the city was taken by the bishop, in 1535, and Boccoldt and many others by the bisnop, in 1535, and Boccold and many others were put to death. The principles of the Annbaptists bad taken deep root in various parts, particularly in the Netherlands. Here Menno Simon, a native of Friesland, and a man of great eloquence, while maintaining the opinions of the Anabaptists upon baptism, preached against their extravagances, and founded the

preached against their extravagances, and tounded the sect of Mennonites. (See Mennonites).

Anadasis, ün-üb'-a-sis (Gr. anabasis, an ascent, an expedition), the name of two ancient historical works. I. The Anabasis of Cyrus, by Xenophon, giving an account of the unfortunate expedition of the younger Cyrus against his brother, the Persian king Artaxerxes, and of the retreat of the Thousand Greeks under Kenophon. 2. The Anabasis of Alexander, by Arrian, of the campaign of Alexander the giving an account of the campaign of Alexander the Great.

ANACABDIACER, an-a-kur'-di-ai'-se-e, in Bot., the ANACARDIACER, an-a-ker-cit-ai-se-e, in Bot., the Cashew.nut, or Sumach ord. of plants. There are 49 genera and about 100 species, nearly all of which are nutives of tropical regions. They yield, by expediation, resins and gums, or acrid and occasionally poisonous juices. The fruits and seeds of some species are edible.

are edible.

ANACARDIUM, din-a-kar'-di-um (Gr. ana, with, kurdia, the heart), in Bot., a gen. of plants belonging to the nat. ord. Anacardiacea. The species A occidentale, the cashew-nut, a native of the West Indies, is remarkable for its large fleshy peduncle, which is eaten as a fruit, and its juice, when fermented, forms a kind of wine. Each peduncle bears a small kidney-shaped nut, the perioarp of which is very aorid, but the seeds are edible. By roasting the nut, the scridity

# Analogy

may be destroyed, and the seed will greatly improve in flavour. The milky juice will stain linen black.

ANGERONISM, in-ik'-ro-nism (Gr. ana, upwates, chrones, time), is a name given to an error in chronelogy, by which the date of an event is placed earlier than it really happened. Anchronisms are net unfrequently to be found in works of art, and are sometimes introduced for the sake of effect; as where Schiller, in his "Piccolimini," speaks of a "lightning-conductor," sithough not invented till 160 years later. An arror on the other side, where an event is placed. An error on the other side, where an event is placed later than it should be, is called a parachronism.

later than it should be, is called a parachronism.

AMACONDA. (See SMARES.)

AMACYCLUS, ån-a-si'-klus (Gr. ana, in the form of, and kyklos, a circle), in Bot., a gen. of plants belonging to the nat. ord. Composite. The root of A. pyrethrum, pellitory of Spain, is employed in medicine as an energetic local irritant and sialogogue, its properties depending on the presence of a volatile oil.

ANEMIA, d-ne'-mi-a (Gr. a, not, and aima, blood), in Path., a term used to denote a deficiency of the red globules or colouring matter of the blood. It is characterized by a nele warv complexion, and a nallor

characterized by a pale waxy complexion, and a pallor in those parts, as the lips, which are generally suffused. It is to be treated with pure air, nourishing diet, and

tonics, such as iron.
Anæsthetics, an'-ees-thet'-iks (Gr. a, privative, and aisthanomai, I feel), a term given to those substances which produce insensibility in the whole or part of the human body, generally by acting on the nervous system. The most familiar instance of anæsthesia is that produced by an overdose of alcohol, in the case of drunken people, who become utterly insensible to pain. Nitrous oxide, or laughing gas, was the first anesthetic which was used for the production of insensibility to pain under surgical operations. This was superseded by ether, which in turn gave way to shlo-roform. (See CHLOROFORM.) Amylene has been much employed as an anæsthetic, but has been abandoned. Rerosolene, a product of coal tar, is much used and recommended by American practitioners. It is almost impossible to overrate the advantages attendant upon the judicious use of anæsthetics in surgical operations. Countless lives have been saved by them, and operations have been performed under their influence undreamt of by surgeons twenty years ago. The injurious effects attributed to chloroform are so few and far between, as to be nothing in comparison with the benefits arising from its use. This latter remark a specially to its administration during childbirth. This latter remark applies

specially to its administration during childbirth.

Anagana, in a-gram (Gr. ana, backwards, and
gramma, a letter), is the formation of a new word or
phrase out of another word or phrase, by the transposition of the letters; as, evil, live; Gulenus, Angelus;
Horalio Nelson, Honor est a Nilo.

Anagyens, anagyi-sris (Gr.), in Bot., a gen. of
leguminous plants. The seeds of A. fatida are very

ANALCIME, d-näl'-seem, a silicate of soda and alumina, remarkable for peculiar optical properties possessed

by it. (See Polarization of Light.)
Analytics, on-e-lep'-tiks (Gr. analepsis, resuming, recovery), a term in Med., applied to those means that are resorted to, to restore the body to a state of health, whether medicines, diet, or regimen.

ANALOGY, a-nal-o-je (Gr. analogia, the same ratio or proportion), properly signifies a similarity of ratios or relations, though it is frequently applied, also, to a similarity of things. A ratio or relation between two objects denotes that they are compared together in common, or to some quality which they both possess in common, or to some manner in which the one is affected by the other. In this way we speak of one ancher of the onner. In this way we speak of one thing being greater, smaller, or more beautiful than another; of the relation of a child to his parents; of a prince to his people. It is, however, only when we come to compare relations, when we find that the relation or ratio of two things is like the relation of two there things that we recompled here a resolution. then or ratio of two things is like the reason of two other things, that we properly have an analogy. A may resemble B, but there is no analogy between them; but if A bears the same relation to B that C does to D, then there is analogy. In relation we have only two terms or objects of comparison; in analogy we must have four, though it is not necessary that all the four be different; for A may bear the same relation

## Analysis

to B that B does to C. Two things may be connected by analogy, though they bear in themselves no resem-blance to each other; for, in analogy, all other attri-butes are kept out of view but those in which they agree. Thus, the bark of a tree is analogous to the skin of an animal, though there is no resemblance between them. In reasoning from analogy, we proceed upon the assumption that things which have many observed attributes in common have other not observed attributes, also in common. If we have observed that two or more things agree in several internal and essential characters, we are disposed to conclude that they agree likewisee in all other essential characters,—that they belong to the same class. Analogy concludes from something observed to something not observed; from something within the sphere of actual experience to something beyond it. Analogy can only give us a high degree of probability, for the simple reason, that it is impossible, under any condition, to infer the unobserved from the observed. "Analogy," says Sir W. Hamilton, "is certain, in proportion—1, to the W. Hamilton, "is certain, in proportion—1. to the number of congruent observations; 2, to the number of congruent characters observed; 3, to the importance of these characters and their essentiality to the since of these characters and their essentiality to the object; and 4. to the certainty that the characters really belong to the objects, and that a partial correspondence exists. Like induction, analogy can only pretend, at best, to a high degree of probability. It may have a high degree of certainty, but it never reaches to necessity. —Ref. Hamilton's Logic; Mill's Logic; English Cyclopedia.

ANALYSIS, a-nal-i-sis (Gr. analyo, Iloosen or untic),

in Log., is a method of reasoning by which we resolve or separate a whole into its constituent parts, and is opposed to Synthesis, in which the parts are collected

into a whole.

into a whole.

ANALYSIS, in Chem., is the term applied to that important branch of research which has for its object the determination of the constituent parts of compound substances. The word is also used, in a restricted sense, to denote a series of operations for ascertaining the constituents of a single compound. We may, therefore, speak generally of chemical analysis, or refer particularly to the analysis of a certain sait. Analysis being the separation of the component parts of a substance, is directly conosed to component parts of a substance, is directly opposed to synthesis, which may be defined as the putting together of elements so as to form a compound. In most of elements so as to form a compound. analytical operations, however, the chemist works by synthesis, as he usually separates two bodies by means of a third, which unites with one of them. (See AFFI-NITY.) It is not ulways necessary to actually separate as consionally charges of colour, or other results, on the addition of the proper tests, indicate the consti-tuents. If the analyst merely seeks a knowledge of the general nature of the substance under examination, he is satisfied when, by the amplication of cortain tests. the component parts in order to ascertain their nature, ie is satisfied when, by the application of certain tests, and by the performance of certain operations, he has obtained evidence of the presence of those elements of which the compound is made up, and the analysis he performs is called a qualitative one; but if he desires to ascertain not only the nature but the actual amount of the elements present, he must separate the consti-tuents of the compound completely from each other, and obtain them either pure, or in some well-known form of combination; he then appeals to the bulance or measure, and the analysis he performs is called a quantitative one. The balance was formerly employed whenever great accuracy was required; but of late, methods of wolumetric analysis have been brought to great perfection. By volumetric analysis is underood the use of messured bulks of test-liquids, containing known quantities, by weight, of certain sub-stances capable of producing, with a solution of the assay, sufficiently marked effects to show with pre-cision the complete conversion of the body sought to be estimated, into a compound, the nature of which is perfectly known. The methods employed for deter-mining the amount of real gold or alkali in certain commercial products, will be fully described in another portion of the work. (See VOLUMETRIC ANALYSIS.) Minerals may be analyzed qualitatively by needs of the blowpipe. (See Blowpipe.) An analysis is said to be presided when the compound substance is resolved

#### Anathema

into components which are themselves compound, and ultimate when the decomposition is carried to its furtheat limits, that is to say, when the compound is resolved into its elements, or the simplest forms of matter. Thus, wheat flour, when subjected to proximatter. Phus, wheat flour, when subjected to proximate analysis, yields gluten, albumen, starch, sugar, gum, oil, and saline master; but each of these proximate principles is a compound, and may be further divided by ultimate analysis; the gluten and albumen into the elements carbon, hydrogen, oxygen, nitrogen, sulphur, and phosphorus; and the starch, sugar, gum, and oil, into the first three of these elements. (See Chemister, Test.) Ref. (Elementary work), Howman's Pruccical Chemistry; (complete manual), Fresenius's Elementary work). senius's Chemical Analysis.

Analysis, Eudiometrical. (See Eudiometry.)
Anamieta, an-a-mir'-ta, in Bot., a gen. of
plants belonging to the nat. ord. Menisperwacea. plants belonging to the nat. and. Menispermacea. The species Anampta paniculate, or eocculus, is a beautiful climbing plant, which is a native of the Malabar coast and the Indian archipelago. Its fruit is poisonous, and is extensively employed by poachers for taking fish and game, and by dishonest publicans for adulterating maltliquors. (See Cocculus

Indious.)

Ananassa, čn-a-nās'-sa, in Bot., a gen. of plants, belonging to the nat. ord. Bromeliaceæ. The species A. sativa furnishes the delicious fruit known as the pine-apple. A large number of pine-apples are now brought to England from the Bahama Islands, but in flavour and lusciousness they are much inferior to those cultivated in hothouses. The fibres obtained from the thick leaves of the plant have been made into paper, cordage, and textile fabrics.

ANAPEST, an'-a-pest, in Greek and Latin Metre, is a foot consisting of two short syllables followed by a

long one.

ANARCHY, an'-or-ke (Gr. a, not, and arche, govern-ment), is a term applied to a society living without any regular government; it may be as savages, in a state of nature, or a people who have thrown off the

state of nature, or sovereign power.

Anas. (See Duck.)

Anastatioa, ön-a-stati-i-ka (Gr. anistemi, I rise again), in Bot, a gen. of cruciferous plants.

The principal species is A. hierochemina, the rose of Jericho, which is found in the deserts of Egypt and Syria. This plant is remarkable for its hyand Syria. This plant is remarkable for its hyand Syria. grometric properties; thus, when full grown, and its branches have become dry and withered, it contracts so as to assume the form of a ball, in which state it is blown hither and thither by the winds; but, if it then meets with any moisture, it uncoils and for a

time seems to regain life.

ANASTATIC PRINTING.—This process is founded on the principle that oil repels water, and vice versa; on the principle that oil repels water, and vice versa; that metals repel water more than oil, a weak solution of gum, or phosphoric acid, and that new print will transfer itself by means of pressure to any smooth surface. A printed page or engraving is moistened with a weak solution of phosphoric acid in gum-water, and pressed with considerable force on a sheet of zinc. The oily printing ink leaves its impression on the plate in the form of a fac-simile of the original, the space between the letters or lines being filled up with water. An inked roller is passed over the plate, and leaves the ink only on the impression; the rest of the plate being wet, repelling the oily matter. Any number of impressions may be pulled, all perfect fuc-similes of the civinal. (See Lyncon, pressions may be pulled, all perfect fuc-similes of the

original. (See Lithography and Zincography.)
Anastomosis, divisionovisis (Gr. ana, through, and stoma, a mouth), a term used in Anat. to denote the communication of the blood-vessels with each other. The necessity of a constant supply of blood to every part of the human body has led to a wise provision, by which, though even one of the larger arteries become obstructed, there are numerous smaller ones communicating with the same part, which, by the in-creased pressure upon them, become enlarged, and supply its place.

Anathena, a näth'e-ma, a term derived from the Greek, and signifying properly something set apart for holy purposes, usually an offering or present made to some deity, and placed in a temple. It also denoted an animal offered in sacrifice to the gods, and hence

came to signify a person devoted to destruction. In the Church the term came to be used as a form of excemmunication, but differed from simple excommunication in being attended with executions and curses. When a heretic renounced his effors, and was received into the bosom of the Church, he was accustomed to declare his heresy "anathema," or a thing accursed.

ANATOMY, a-null'-o-me, is a term derived from the Greek verb autenso. I out up, and properly signifies the separation of a thing into parts by cutting. All material substances either are or have been, or are not and have not been, possessed or endowed with life. The former have an organized structure, in which, in the living state, changes take place, and processes are carried on necessary to their existence. The latter are composed of homogeneous particles, and are subject only to mechanical or chemical changes. In the former are comprehended all plants and animals, in the latter all mineral or inorganic substances. It is to the former of these two great divisions that the term anatomy is applied. It is the art of dissecting organized bodies for the purpose of ascertaining their internal structure; it is also the science which deals with the knowledge thus acquired, and deduces general principles from it. As organized bodies naturally form themselvs into two distinct classes,—plants and anithemselve into two distruct classes,—plants and animals; so we have vegetable anatomy, or the anatomy of plants, and animal anatomy, or the anatomy of animals. Animal anatomy, again, is subdivided into comparative anatomy, which treats of the structure of all animals except man, and human anatomy, which deals with the structure of man only. It is to this last that the general term anatomy is usually applied. last that the general term anatomy is usually applied. Human anatomy, or anatomy proper, then, treats of the several parts and organs of the human body, in respect to their form, structure, and relation to each other. It is usually divided into general, descriptive, and pathological. General anatomy treats of the nature and general properties of the separate substances of which the body is composed, separate substances of which the body is composed, not as these exist combined in special organs, but as they form distinct and peculiar substances. Descriptive anatomy comprehends a description of the several parts and organs of the body, with an account of their situation, connections, and relations, as existing in the natural and healthy state. Pathological, or morbid anatomy, traces and describes the changes produced by discret, when healthy structures whether existing by disease upon healthy structures, whether existing in individual organs, or in the primitive or common substances of which these organs are composed. As an account of the various parts and organs of the human body, as well as of the diseases to which they are subject, will be found under their several names, in other parts of this work, it is unnecessary to do more here than give a short summary of the subject, referring to these articles for more special information.

General Anatomy.—The human body consists of solid and fluid substances, the fluid bearing to the solid parts a general ratio of from 7 to 1 to 9 to 1. The fluids of the body are various, but may be divided into three classes—the circulating nutritious fluid called the blood; the fluids which are incessantly poured into it for its renewal, viz. the chyle and lymph; and the fluids which are separated from it by secretion, as salive, bile, gastric juice, &c. The blood is that well-known red fluid which, by means of the heart, arteries, and veins, circulates through all parts of the system, and supplies the waste that is constantly going on. The chyle is a milky fluid, separated from the stomach into the small intestines, and become mixed with the bile and pancreatic juice. It is absorbed by the lastcals, and conveyed by duets or canals to the receptaculum chyli, where it is taken up by the thoracic duct, and poured into the blood. The lymph is colourless fluid, like water, taken up by the hymphsia vessels, which pervade almost every part of the body. It seems to differ little from chyle, except that the lutter contains a greater preponderance of fatty matter. The greater portion of the lymph is poured into the receptaculum chyli, where it is becomes mixed with the chyle, and is carried with it into the blood; that, however, collected from the right side of the head and chest, and cright upper limb, is conducted into the right

subclavian vein, by the right lymphatic or right thoracic duct. The accretions are those fluids secreted or separated from the blood. The term is sometimes used to include the excretions which are thrown off from the body as useless or noxious, as urine from the bladder, perspiration from the skin; but it is properly applied only to such products as are secreted from the blood, but still retained in the system for the performance of certain subordinate actions. These are,—L. saliva, secreted by the salival glands of the mouth; 2. gastric juice, by the stomach; 3. pancreatic juice, by the pancreas; 4. bile, by the liver; 5. tears, by the lachrymal gland; 6. milk, by the mardmary glands; 7. somen, by the testes; 8. oil, by the vessels of the adipose tissue; 9. synovia, by the mucous glands. The organized solids of the human body are usually divided into the following asynetees elementary issues.

divided into the following seventeen elementary tissues: -1. Bone, or osseous tissue, which forms the framework of the body, to which the other structures are statehed, or in which they are contained. 2. Muscular tissue, consisting of fine fibres, which are for the most part collected into distinct organs called muscles, by means of which the active movements of the body are performed. 3. Adipose tissue, which constitutes the fat of the body as well as the marrow of the hones.

4. Arcolar, cellular, or connective tissue, a soft filementous substance of considerable tenacity and elasti-city, which is extensively distributed over the body, and s the connecting medium of all the other tissues. 5. Fibrous tissue, formed of a number of minute fibres or information of a number of munite fibres running chiefly parallel to each other, and sparingly supplied with blood-vessels or nerves, and used for connecting, enveloping, or binding together, various parts of the human body, as tendons, ligaments, fascise, periosteum, perichondrium, dura mater. 6. Eleation really tierm a harmonical harmonical. cie, periosteum, perionondrum, dura mater. 6. Silas-tic, or yellow tissue, characterized by possessing a high degree of elasticity, and employed wherever that quality is required, as in forming the spinal ligamenta subflava. 7. Cartilage, an opaque substance, usually of a pearly or bluish-white colour, but sometimes yellow, covering the articular extremitics of the bones, yellow, covering the articular extremities of the bones, connecting the surfaces or margins of immovable bones, or liming the walls of certain cavities, also found in the ear, nose, larynx, &c. Fibro-cartilage is, as its name indicates, a structure intermediate between fibrous tissue and cartilage, partaking, in some measure, of the firmness of the one with the elasticity of the other. 8. Nervous tissue, which goes to form the nervous system. 9. Blood-vessels, comprising the arteries by which the blood is conducted from the heart to all parts of the body; the veins, by which it is brought back again to the heart; and the capillaries, minute vessels by which it is carried from the extremities of the one to those of the other. 10. Absorbent vessels and glands, comprising the lacteals and lymphatics, together with the glands in connection with them. 11. Scrous and synovial membranes, which resemble each other in general form and structure, but are distinother in general form an structure, but are distin-guished by the nature of their secretions; the former lining the cavities of the body which have no outlet, as the peritoneum in the abdomen, the pleure and peri-cardium in the chest, and secreting a transparent and nearly colourless fluid, which moistens the surface; the latter lining the cavities of the joints, and secreting a viscid fluid which lubricates their surface. 12. Muthe body exposed directly or indirectly to contact with the atmosphere, and secretes a fluid of a more consistent and tenacious character than the serous membranes. 13. Secreting glands, a class of organs widely differing from each other in their nature and form, but all devoted to the function of secretion. 14. Vascular or ductiess glands, so called from their general resemblance to secreting glands, but differing from them in having no duct for the conveyance of their secretions, which are reabsorbed or filtered through the tissues, or find an outlet by bursting. 15. Skin,—cutis vera, derma, or occium, the innermost of the three structures derms, or corrum, the innermost of the three structures that go to make up what is commonly termed the skin, and which covers the whole body. 16. Figment, a black or dark-coloured substance occurring in various parts of the body, and giving colour to the skin of the negro and other dark races. 17. Epithelium, a thin transparent structure covering the whole surface of the

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body, as well as the walls of the different cavities, and named differently, according to the parts which it covers; as, epidermis, covering the skin; the epithelium

covers; as, epidermis, covering the akm; the epidemium of mucous membranes, &c.

Descriptive or Special Anatomy, is commonly divided into several branches, according as it regards the bones (Osteology); the articulations; the muscless (Myology); the blood-vessels and absorbents (Angiology); the uer-

the blood-vessels and absorbents (Angiology); the nervous system (Keurology); the organs of sensation, respiration, digestion, &c. (Splanchnology).

Outcology.—The number of bones in the human body is variable; but in the adult they are estimated at about 244. They are usually divided into long, flat, and irregular;—long, as in the thigh and leg; flat, as in the skull and pelvis; irregular, as in the hands and feet. Bones are covered with a peculiar membrane called the periosteum, which serves to conduct the blood-vessels and nerves. The osesous skeleton is divided into head. The osseous skeleton is divided into head, and nerves. trunk, upper and lower extremities. The head comtrunk, upper and lower extremities. The head com-prises the bones of the cranium and those of the face, including three common to both. The bones of the cranium are eight in number,—the frontal, in the fore part of the skull; the two parietal, forming a portion of its sides and all its superior part; the occi-pital, forming its lower and back part; the two temporal, forming the lower part of the sides and part of the base; the sphenoid, in the middle of the base; and the ethmoid, in the middle of the fore part of the base. The bones of the face are fourteen in number,— the ossa nasi, which form the arch of the nose; the ossa lacrymalia, at the fore part of the inner edge of the ocular orbits; the malar bones, forming the prominences of the cheeks; the upper maxillary bones, forming the upper jaw, and containing the upper teeth; the ossa palati, situated at the posterior part of the palate, the nose, and the orbits; the vomer, a flat bone, forming part of the septum of the nose; the ossa turbinata inferiors; and the lower maxillary bones, forming the interiors; and the lower maintage object, so that the lower jaw, and containing the under teeth. There are thirty-two teeth,—sixteen in each jaw; viz., four incisors or front teeth, two cuspidsti or canine, four bicuspidsti, and six molares. The last molar on each side is called the dens sapientia, or wisdom-tooth, from not contain the same of treatment. The containing the last molar on the last molar or each side is called the dens sapientia, or wisdom-tooth, from not appearing till about the age of twenty-one. The os hyoides, or by oid bone, is placed in the anterior and upper ayones, or myold bone, is placed in the anterior and upper part of the neck, and hasp, o sessous connection with any other bone. The trunk is divided into the spine, thorax, and pelvis. The spine is a pyramidal column, extending from the head to the pelvis, and is composed of twenty-four bones, termed vertebræ. Each vertebra consists four bones, termed vertebra. Lach vertebra consists of a body and seven processes, and has a foramen, or ring, through which the spinal cord passes. They are divided into three classes,—the cervical, including the first seven; the dorsal, consisting of twelve, which are larger than the cervical, and are distinguished by have the consistency of the constant of the contract of the first seven; the dorsal, consisting of twelve, which are larger than the cervical, and are distinguished by having their sides and transverse processes depressed for connection with the ribs; and the lumbar, consisting of five, which are larger than any other. The first two cervical vertebræ differ from the others, and are known as the atlas and the axis, or vertebra dentata. There are likewise five so-called false vertebræ, on account of their being separate in early life, but afterwards uniting to form the os sacrum, which constains the principal organs of circulation and respiration, is the largest of the three great cavities connected with the spine, and is formed by the sternum and costal cartilages in front, the twelve ribs on each side, and the dorsal vertebræ behind. The sternum is a fist narrow bone, situated in the anterior part of the thorax, and connected with the ribs by means of the costal cartilages. The ribs are twenty-four in number, twelve on each side, of which the first seven are termed vertebro-sternal, or true ribs, and are attached to the sternum; three are attached to the termed, vertebrate of locating ribs, from their anterior extremities being free. The pelvis, or lower cavity of the trunk, consists of four bones,—the os sacrum and os coccygis behind, and the two osas innominats on either side. The occogyis, which forms the terminal bone of the spine, is sometimes regarded, like the os sacrum, as composed of four false vertebræ, which are at first distinct, but afterwards become united. The ossa innominata are two irregularly-

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enaped bones, situated one on each side of the pelvis, and consisting of three parts, the ilium, ischium, and pubis, firmly united in the adult, but distinct in theyoung subject. Each of the two upper extremities is composed of the boxes of the srm, the forearm, and the hand, and is united to the trunk by means of the scapula side a flat triangularly-shaped bone, placed upon the upper and back part of the thorax. The clavicle, or collarbone, is a long bone, something in the form of the italic letter f, and situate between the top of the sternum and the acromich process of the scapula. The arm has only one bone, the os humeri, which extends from the scapula to the bones of the forearm. The forearm consists of two bones, the radius and ulna, which are consists of two bones, the radius and ulna, which are parallel, and play upon each other; thus admitting of freer motion in that part. The radius, so called from its resemblance to the spoke of a wheel, is situate or the resemblance to the spoke of a wheel, is studied or the outer side of the forearm. Its upper end is small, and forms only a small part of the elbow-joint, while its lower extremity is large, and forms the chief part of the wrist-joint. The ulna is placed at the inner side of the forearm, and differs from the radius in being larger at the upper than at the lower extremity. The bones of the hand are divided into the carpus, the metacarpus, and phalanges. The bones of the car-pus, or wrist, are eight small bones, arranged in two metacarpus, and phasanges. The once of the carpus, or wrist, are eight small bones, arranged in two rows, the upper row comprising the scaphoid, semi-lunar, cunctiorm, and pisiform,—the lower, the trapezium, trapezoid, os magnum, and unciform. The metacarpal bones, or bones of the palm, are five in number, and correspond to the flugers. The phalanges, or bones of the flugers, are fourteen in number, each finger, with the exception of the thumb (which has only two), having three of them. The upper and lower extremities bear a great resemblance to each other in the nature and form of their bones. Like the upper, each of the lower extremities consists of three distinct parts—the thigh, leg, and foot. The thigh is composed of a single bone, the os femur, which is the longest and largest in the body. The upper part forms a round head, which is inserted into a deep cup-like cavity of the os innominatum, called the acetabulum: the lower terminates in two protuberances, known as the inner and outer contwo protuberances, known as the inner and outer con-dyles, separated posteriorly by a deep fossa, called the inter-condyloid. The leg consists of three hones,—the patella, tibia, and fibula. The patella, or knee-pan, is a small, flat, triangular bone, of a spongy texture, situated at the anterior part of the knee-joint, between the femur and the tibia. The tibis and fibula in the leg resemble the radius and ulna in the forearm; the tibis is, after the femur, the largest bone of the body; it is situate at the anterior and inner side of the leg, articulating with the femur above and the astragalus below. The fibula is considerably smaller than the articulating with the femur above and the astragalus below. The fibula is considerably smaller than the tibia. Its upper extremity is small, and placed below the level of the knee-joint, but the lower extremity projects below the tibia, and forms the outer sukle. The foot, like the hand, is composed of three classes of bones,—the tarsus, the metatarsus, and the phalanges. The tarsus is composed of seven bones,—the os calcis, astralagus, cuboid, scaphoid, and three cuneiform. The metatarsal bones are long small bones, five in number, connected at the one extremity with the in number, connected at the one extremity what the tareal, at the other with the phalangeal bones: these last go to form the toes, each of which has three, except the great toe, which has only two.

Articulations.—The different bones of the skeleton

are connected together in various ways, and such connections are termed articulations. They are of various kinds, but are usually divided into immovable, movable, and mixed. Immovable articulations exist where flat and broad bones are united to inclose important organs, as in the cranium and pelvis. parts the edges indent or interlock each other; in others they are brought into close contact, or are united together by a thin layer of cartilage. The movable articulations are of various kinds, according to the kind of motion required. In such cases, the bony striculations are of various kinds, according to sake kind of motion required. In such cases, the bony surfaces brought into contact are covered with cartilage, bound together by ligaments, and lined by synovial membrane. Mixed articulation prevails where only a slight degree of motion is required, combined with great strength, as in the vertebres. The

conclusions which are necessarily true, from the opposite being impossible. An apodistical argument, therefore, is one which excludes the possibility of the opposite.

opposite.

Aroszz, &p'-o-je (Gr. ape, from, and ge, the earth),
means the greatest distance of any heavenly body from
the earth; but it is applied more particularly to the
sun and moon. The former is in its apogee in its
apparent course when the earth is in its aphelion; the
moon is in its apogee when it reaches that point in its
ability in the carth is presented by the earth.

orbit which is most distant from the earth.

APOLLIMARIANS, å pol'-li-nai'-ri-äus, an ancient sect of heretics which arose in the latter half of the 4th century, and were named after Apollinaris, bishop of Laodicea. They denied that our Saviour had a reason. able soni, and asserted that its place was supplied by the Logos, or divine nature. This dectrine was conthe Logos, or dune nature. This decertine was con-demned as heretical by various councils, including that of Constantinople, in 391. The Apollinarians were also forbidden by imperial edicts, in 388 and 397, from holding religious assemblies, and in 428 from having pastors or residing in cities; and they at length entirely disappear.

APOLLO BELVIDEER, &-pol'-lo bel'-vi-deer, the name commonly borne by a beautful statue of the heathen divinity Apollo or Phochus (see Beeton's Dictionary of Biog.), which about the close of the 16th century, was found in the ruins of the ancient Antium. Pope Julius II. bought it, and had it placed in the Belvi-dere of the Vatican at Rome; whence the name. It is generally admitted to be the most magnificent work of generally admitted to be the most magnificent work of art in existence, a copy of it being used in every Euro-pean school of art as a drawing-model for students. In this chef-d cauve of Grecian art, the divinity is seen in a standing position, almost nude: over his right shoulder is suspended a quiver, upon his extended left arm he carries his pallium, and in his hand is seen the remnant of a bow, from which an arrow is supposed to have been discharged at the serpent Pethor. The have been discharged at the scrpent Python. whole statue is characterized by a combination of grace, beauty, and symmetry of proportion. By some critics it is held that Pliny makes allusion to this beautiful that I have that I have generally received opinion is that the sculptor is entirely unknown. For a time the statue was kept in Paris, whither it had been conveyed by the emperor Napoleon I.; but at his downfall this marrel of antique art was restored to its former home in the Vatican.

Apologram, d-pol-o-jet'-ik (Gr. apologeomai, I speak in defence of), is a term applied to designate something said or written by way of excuse or apology for any

action or person; as an apologotic essay.

Arologitics, b-pol-o-jett-ike, in Theoft, is a term applied to that branch of divinity which has for its object a systematic arrangement of those external and internal evidences of Christianity by which Christians Internal evidences of Unrastranty by which Unrabates are enabled scientifically to justify the peculiarities of their faith. Apologetics defend the fundamental principles of Christianity against unbelievers; polemics defend one particulur belief, or class of beliefs, against others. Apologies for certain doctrines of Christianity, or defending it from charges brought against it by its opponents, have appeared from very early times; as the apologies of Tertullian, Justin Martyr, Origen, and others; but it was not till the 18th century that and others; but it was not the the four century that apologetics came to be regarded as a distinct branch of theological science. The name was first brought into use by J. G. Planck, in his Einleitung in die theologischen Wissenschaften, 1794. The first work, however, which can be said to have treated the subject of complexities in a scientific warmen in that of P. E. ever, when can be said to have treated the subject of apologeties in a scientific manner is that of P. E. Müller, published at Copenhagen in 1810, and entitled Kristeliy Apologuist, eller Videnskabelig Udvikling of Grundene for Kristendommens Guddommetished (Christendommens Guddommetished (Christendommens) tian Apologetic; or, a Philosophical Exposition of the Arguments for the Divine Origin of Christianity). Since that time, various works have appeared on this subject, particularly in Germany. The fundamental principle of apologetics is the necessity of a superprinciple of approgresses are necessity of a super-natural revelation. It treats of the logical, moral, and metaphysical possibility of a revelation; of the necessity of a revelation; and demonstrates, from in-ternal and historical evidence, the truth of revelation.

convey some moral truth. The fables of Alsop are of this class.

Arology, d-pol-o-je(Gr. apologia, a defence, apology), originally denoted a defence made in a court of justice in favour of one accused. As these were frequently earefully written out, and afterwards made public, it came to be applied to works written in defence of any particular person or doctrines. Of this nature are the apologies of Socrates, attributed to Plate and Xenoapologies of Socrates, attributed to Plato and Keno-phon. The word was adopted by the Christian fathers, and applied by them to works in defence of certain doctrines of Christianity. (See APOLOGETICS.) In ordinary language the word is used at present in the sense of asking pardon or excuse for some offence.

APOWEROSIS, dp-0-nu-vo-sis (Gr. apo, from; neuron, a tendon), in Anat., the membrane or tendon by which the muscles are attached to a bone, called aponeurosis of insertion. The term is also applied to a membrane within the substance of muscular fibres, called aponeurosis of intersection; also to a membrane surrounding a muscle and preventing its displacement,

called enveloping sponeurosis.

AFORITHEGH, ap-o-them (Gr. apophthegma, an utterance), a short pithy saying or maxim, conveying a great moral truth in few words. The wise men of antiquity, and the oracles of the gods, frequently expressed themselves in this way. Among the bestknown collections of apophthegms are those made in ancient times by Plutarch, and those in modern times

APOPHYLLIC ACID, il-pof'-il-lik, an acid obtained from narcotine, the crystals of which resemble those of

apophyllite; whence its name,

APOPHYLLITE, "poj"-il-lite (Gr. apophullico, to strip of leaves), called also the "fish-eye stone," a mineral or teaves), called also the missey stone, a mineral cocurring in white, pearly, square prisms or pyramids. It is a silicate of lime and sods, and is found in the magnetic iron deposits of Sweden and Norway. So named from its tendency to exicliste under the blow-

APOPLEXY, ap-o-plex'-c (Gr. apoplexia, a sudden blow, a privation of sense and motion), in Path, is the name of a disease characterized by a sudden abolition or great diminution of the powers of sensation and voluntary motion, while the organic functions of the body,—circulation, respiration, secretion, &c., are still carried on, but usually in a more or less impaired state. The attack is sometimes instantaneous; at other times it comes on by degrees. The face is generally flushed; the breathing slow, deep, and stertorous, the pulse fuller, stronger, and slower than natural, and the skin covered with a cold clammy perspiration; sometimes, however, the pulse, instead of being full and strong, is weak and intermitting, and the face pale and dejected. Apoplexy springs from a diseased condition of the brain, and is occasioned by whatever unduly impedes or accelerates the circulation of the blood within the brain, or exerts a certain degree of pressure upon it. Hence, violent exertion, either of mind or body, great mental auxiety, intemperance in eating or drinking, are among the exciting causes of it. Males are much more liable to it than females, and it is most common between the ages of fifty and seventy. A man of a sanguine plethoric temperament, with large head and full neck, is most liable to its attack, though lean persons are also frequently among its victims. Though the attack is usually so sudden, it is not without its premonitory symptoms, which, though numerous and diversified, are yet obvious and easily understood. Among these, are excessive drowsiness, giddiness and headache, with frequently dulness of hearing, imperfect or disordered vision, noise in the ears, loss of memory, &c. Sometimes the attack is preceded by paralysis affecting the speech, hands, feet, or other part of the body, and frequently it is succeeded by paralysis. When judicious remedies are or other part of the body, and respectively, and respectively precipies. When judicious remedies are adopted in time, an attack may generally be averted or rendered comparatively mild. Much necessarily depends upon the patient himself; upon his avoiding those states and modes of life that predispose to it. and metaphysical possibility of a revelation; of the test precise, and attending necessity of a revelation; and demonstrates, from internal and historical evidence, the truth of revelation. Apologous, a fable,) is a ing to the causes that may have induced it. In some fable, parable, or short fictitious story, designed to

in others stimulating remedies are what may be rein others stimulating remedies are what may be required. In all cases, however, the patient's head should be raised, the head and neck hared, and the freest circulation of fresh air promoted; and, as soon as possible, purgative medicines should be administered. The attack may lest from a few hours to two or three days; and even when it does not destryo life, it usually gives a shock to the constitution, which is seldom entirely recovered from.

APOELA, & Poor'-i-E (Gr. aporeo, I doubt), is the name of a figure in Rhet., by which the speaker seems to be in doubt whether to say anything or not, or where to begin in a multitude of arguments; as, 'Of what shall I first complain?' 'Where shall I seek to be a company of the pool of the complain of the shall I seek to be a complain or the complain of the compla This figure is sometimes used with great

effect.

APOSIOPESIS, d-po'-si-op'-e-sis (Gr. aposiopae, I am silent), is a figure in Rhet., in which the speaker breaks off abruptly in the middle of a sentence, leaving his hearers to supply what he was going to say; as, 'His conduct was—but we must not lose time in words.'

It usually denotes great anger or grief.

APOSTACY, a-pos'-ta-se (Gr. apostusis, a forsaking, ANOSTACY, a-por-uses (or apparate, a normaning, descripin), is a going sway or defection from one's original profession or party. In Theol., it is a forsaking or renouncing of one's religion, either openly or virtually. The primitive Christian church distinguished or renouncing of the straight church distinguished several kinds of apostacy:—1. Those who went entirely from Christianity to Judaism; 2. those who complied with the Jews in many of their unlawful ceremonies, and profession of their religion; without making a formal profession of their religion; 3. those who mingled Judaism and Christianity to-

3. those who mingled Judaism and Christianity together; and 4. those who relapsed into paganism.

Apostacy, in Law, a total renunciation of Christianity, by embracing either a false religion, or entertaining no religion at all. The offence can only take place in such as have once professed the Christian religion. Heavy penalties, including loss of life, formerly attached to apostacy. Now, by 2 & 10 Will.

III. c. 32, it is provided that if any person educated in, or having made profession of the Christian religion, shall, by writing, printing, teaching, or advised suggests. in, or having made profession of the Christian religion, shall, by writing, printing, teaching, or advised speaking, deny the Christian religion to be true, or the Holy Scriptures to be of divine authority, he shall, upon the first offence, be rendered incapable to hold any office or place of trust, and, for the second, be rendered incapable of bringing any action, being guardian, executor, legatee, or purchaser of lands, and shall suffer three years' imprisonment without bail. To give room, however, for repentance,—if, within four months after the first conviction, the deliuquent will in open court publicly renounce his error, he is discharged for that once from all disabilities.

APOSTASIACEE, a pos'-tii-si-ai'-se-e, n nst. ord. of plants, named after the gen. Apostasia, and belonging to the class Monocotyledones and sub-class Petaloidea. Herbs with regular hermaphrodite flowers, growing in the damp woods of tropical India. There are three genera and five species. Their properties are alto-

gether anknown.

APOSTATE, a-pos'-tait (Gr. apostasis, a desertion), one who openly abandons the true religion. In Keel.

one who openly abandons the true religion. In Kecl. Hist. it is applied, by way of special imputation, to the emperor Julian, who, though at first professing Christianity, when he came to the throne openly renounced it, and did all in his power to re-establish paganism.

A POSTLIN, a-post-el (Gr. apostolos, a messenger), properly signifies one sent or delegated by another upon some business. In Theol. it denotes, by way of eminence, one of the disciples specially commissioned by Christ to preach the Gospel. Out of the number of his disciples, our Lord selected twelve to be invested with the spostieship. Their names were Simon Peter, and Andrew, James the Greater, John, Philip, Bartholomew, Thomas, Matthew, James the Less, Jude, surnamed Lebbens or Thaddeus, Simon the Canasnite, and Judas lacariot. About eight months after their surnamed Lebbeus or Thaddeus, Simon the Canaanite, and Judas Iscariot. About eight months after their solemn election, and in the third year of our Lord's public ministry, they were sent out by two and two to declare to the people of Israel (not going to the Samaritans or Gentiles) that the kingdom of heaven was at hand, and to confirm their dectrine by miracles. public ministry, they were sent out by two and two to declare to the people of Israel (not going to the Bame, ritans or Gentiles) that the kingdom of heaven was at hand, and to confirm their doctrine by miracles. The eighth book, which relates only to the sacred offices, They were to make no provision for their subsistence and is written for the priests, belongs probably to the 99

on their journey. After the resurrection of our Lord, the place of Judas was supplied by Matthias, and the aposities received a new commission of a more extensive nature,—"To go and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Holy Ghost." Paul, and, according to some, Barnabas, were subsequently added to the list of apostles, without regard to the number twelve. After they had exercised their ministry for some years in Palestine, it is said they resolved to disperse themselves to different parts of the world, and determined by lot what parts each should take; but of their travels and subsequent labours we have little reliable information. It was essential to an apostle—1. That he should apostles received a new commission of a more extention. It was essential to an apostle—1. That he should have personally seen Christ; 2. that he should have been immediately called and chosen by Christ himself . B. that he should have been divinely inspired and fully instructed in the mysteries of the kingdom of heaven, so as to be secured against all mistakes in teaching divine truth; secured against all mistakes in teaching divine truth; and 4. that he should have the power of working miracles in attestation of his commission, and of the truth of his doctrine. They were not restricted, like bishops and pastors, to any particular church; and they had no successors in office. The respective badges or attributes with which the several apostles are usually represented are, St. Peter with the keys; St. Paul with a sword; St. Andrew with a cross; St. James the Less with a fuller's pole; St. John with a James the Less with a fuller's pole; St. John with a cup and a winged serpent flying out of it; St. Bartholomew with a knife; St. Philip with a long staff, whose upper end is formed into a cross; St. Thomas with a lance; St. Matthew with a hatchet; St. Matthias with a battle-axe; St. James the Grester with a pigrim's staff and a gourd-bottle; St. Simon with a saw; and St. Jude with a club. St. Paul is semetimes styled, by way of eminence, the Apostle of the Gentiles, as St. Peter was called the Apostle of the Circumcision. The appollation of specific was comptimes given to the appollation of apostle was sometimes given to the ordinary travelling ministers of the Church; as where the apostle Paul speaks of Andromous and Junis as of note among the apostles. According to some, Barna-bas was an apostle in this sense; though others hold that he was one in the highest sense. This was also a that he was one in the highest sense. This was also a title given to those sent by the churches to carry their alms to the poor of other churches. Thus St. Faul, in writing to the Philippians, tells them that Epaphroditus, their apostle, had ministered to his wants. Apostle is also thought by many to have been originally used for bishop before that name was introduced. Among the Jews, it was the name of an officer sent into the different perts of the country to see that the laws were duly observed, and to collect the moneys for the terrula. To like wasture, it is frequently walled. laws were duly concrete, and to collect he moneys for the temple. In like manuer, it is frequently applied to one that has first planted Christianity in a place; as Xavier, the Apostle of the Indies. In the Greek Liturgy, spostle is the name of a book containing the epistles of St. Paul, printed in the order in which they are to be read in churches throughout the course of the year.

APOSILES, ACTS OF. (Scc ACTS OF THE AVOSILES.)
APOSILES CHEED (Lat. credo, I believe), is the
name of a formula of summary of the Christian faith,
drawn up, according to some, by the apostles at Jerusalem shortly after our Lord's ascension; and hence its name. There are many reasons for doubting this; but that it is very sucient is evident from the fact, that it is to be found as it now stands in the works of St. Ambrose and Rulinus, both of whom flourished in the

4th century.

APOSTOLIC, OF APOSTOLICAL, ap-os-tol-ik, is a term. applied to something relating to, connected with, or descended from the apostles; as, the apostolic age, the apostolic doctrine, the apostolic character. The Apostotic Canons are certain rules or laws for the government of the Church, held by some to have been drawn up by of the Church, head by some to have been drawn p by the apostles themselves. There is no sufficient ground for believing that this was the case: they probably be-long to the 4th or 6th century. The Apostolic Constitu-tions consist of eight books; of which the first six con-tain directions for the whole of Christian life, and were middle of the 4th century. There are, however, numerous later interpolations. Apostolic Charches was anciently a name given to those churches which were supposed to have been founded by the apostles. In after-times, other churches assumed this title, principally on account of their supposed conformity with the dootrines of the churches planted by the apostlee. The term Apostolical was first applied to bishops in the 6th century. Afterwards, the title was assumed by the popes of Rome, as being the successors of the chief apostle, Peter. Hence the terms Apostolic Church, Apostolic See, Apostolic Charr, Apostolic Bleesing, &c. Apostolic Fathers is an appellation usually given to the writers of the 1st century, who employed their pens in the cause of Christianity. They were Clement, Barnabas, Ignatins, Polycarp, and Hermas.

Arosporter Succession, ap-os-tol-i-kal, in Theol., is a term applied to the line of unbroken succession in which the ministry of the Church has been continued from the days of the spostles to the present time. "The clergy of the Church of England can trace their

"The clergy of the Church of England can trace their connection with the apostles by links, not one of which is wenting, from the times of St. Paul and St. Peter to our own."—Hook's Church Dictionary.

Arosrolics, or Arosrolici. Ap-os-tol'-iks, in Eccl. Hist., is the name of three different sects, who professed to imitate the manner and practice of the apostles. The first of these, called also Apotactici, or Apotactice, sprang from the Encratices and Cathari, and flourished in the 2nd and 3rd centuries. They professed to have all things in common, to abstain from marriage, and the use of wine, flesh, &c.; but little more is known respecting them. The second sect belongs to the 12th century. They are said to have been free from error in doctrine, and to have been irreproachable and exemplary in their lives and manners. They were peculiar in holding it unlawful to take an oath. in permitting their hair and beards to grow to an enormous length, in proferring celibacy to wedlock (calling themselves the chaste brothers and sisters), and in each themselves the chaste brothers and sisters), and in each man having a spiritual sister, with whom he lived in a domestic relation. The founder of the third sect was Gerhard Segarelli, of Parma, who, in 1260, assumed an apostolic garb, and wont forth as a preacher of repentance; and gradually a number of others joined him. There being nothing startling in their doctrines, they were, for upwards of twenty years, allowed to pursue their course unmolested, and they extended their labours beyond the limits of Italy. At length therapid spread of their doctrines excited the attention of the Church, and Honorius IV., in 1286, issued a bull against them, which was followed four years later by another, by Nicholas IV. Opposition, however, only led them to inveigh more boldly against the errors and corruptions of the Church of Rome, which they described as the Babylon of the Apocalypse. They were now persecuted Babylon of the Apocalypse. They were now persecuted as the state; and many of them perished at the stake; and among others, Segarelli, in 1300. He was succeeded and among others, Segarell, in 1300. He was succeeded by Dolcino, a man much his superior in education and mental qualities. After travelling for some time in Italy, spreading the tenets of his sect, but everywhere dogged by the inquisition, he retired for safety to Dalmalia. After a time he again made his appearance in Italy; but being still an object of persecution, he established himself, with about 2,000 of his adherents, walk and formular the required by the interest of the state of the same of the s male and female, on the mountain Zebello, in the dio-cess of Vercelli. In 1305 a crusade was proclaimed against them, and for two years Dolcino, with consum-nate skill and bravery, defended himself against his enemies, till famine effected what force could not accomplish, and the remnant of famished Apostolics were compelled to surrender. Doleino, after undergoing the most cruel tortures, which he bore with the greatest fortitude, was put to death. In Lombardy and the south of France remnants of the sect existed till 136s. The Apostolics repudiated all rights of property and all inequalities of condition. They were not bound together by any formal vows, nor, by rules, to obedience

and took its name from Samuel Apostool, an eminent minister among the Mennonites.—Ref. Mosheim's Eccle-

minister among the Monnonites.—Ref. Mocheim's Reclesiastical History.

Arosracorra, d-pos'-tro-fe (Gr. apastrophe, a turning away, or breaking off), is the name given to a figure in Rhet., when a speaker breaks off suddenly in the course of his speech, and addresses directly a person absent or dead, or an inanimate object, as if present and listening to him. It is also frequently nued by the poets; and when well minaged, it has a very striking effect; as, "O thou sword of the Lord! how long will it be ere thou be quiet! put thyself up into the scabbard, rest and be still." It denotes strong passion, or emotion.—In Gram., it is used to denote the omission of a letter or letters in a word; as boro' for borough.

The comma employed to mark such omission, or which The comma employed to mark such omission, or which

The comma employed to mark such omission, or which is used in genitives, is termed an apostrophe.

Aporthecantes' Company, "". "poth'-s-kares. — The company of Apothecaries, which is one of the most important guilds of the city of London, was established in the early part of the 17th century. The Apothecaries were first incorporated with the company of Grocera was always. were arst moorporated with the great after, they were separated from the Grocers, and incorporated by a charter granted by King James I., as "The Master, separated from the Grocers, and morporated by a charter granted by King James I., as "The Master, Wardens, and Society of the Art and Mystery of Apothecaries of the City of London." This charter was granted by the king at the advice of his physicians was granted by the king at the advice of his physicians Gideon do Laune, Mayerne, and Akins; and it was enacted that no grocers or others should retail any medicines, without the company's consent, within the city, or seven miles thereof; at the same time, the company obtained full permission to seize all unlicensed drugs. By the statutes of William III. and Anne, "Apothecaries of the city of London are exempted from the offices of constables, scavengers, overseers of the poor, and other parish, ward, and leet offices, and of and from serving upon juries or inquests." Towards the close of the 17th century, the spothecaries of London began to prescribe as well as to dispense medicines, and, by way of retailation, the College of Physicians established a dispensary for the sale of medicines at prime cost. The privileges of the Apothecaries' Company were subsequently greatly enlarged, caries' Company were subsequently greatly enlarged, and the right of members to prescribe in a certain restricted sense was confirmed by an act of parliament, 55 Geo. III. c. 194. (See Chemist and Deuggist.) Apothecaries II all is situated in Union Street, Blackfriers, and is a large plain brick building. Great quantities of pure medicine are prepared at the Hall, and retailed in a shop adjoining, at low prices. The relations between the Apothecaries' Company and the

general body of chemists and druggists are explained in another part of this Dictionary.

APOTHECARIES' WEIGHTS AND MEASURES.—The system of weights used by physiciaus and apothecaries (chemists and druggists) in prescribing and compounding medicines differs materially from that used in general commerce. The term apothecorries weight is usually applied to the one system, and avoirdupois weight to the other. In the London, the Edin-burgh, and the United States pharmacoposiss, every preparation is expressed in apothecaries weight, or, ourgn, and the United States pharmacopesias, every preparation is expressed in apotheoaries' weight, on to adopt a pharmacoutical phrase, this system of weights is officinal. In the Dublin pharmacopesia, avoirdupois weight is employed. There is also a third system, called troy weight, which is used by jowellers, and at the mints, in the exchange of the precious metals. These three systems can be adapted to each other through the series or common unit of weight. other through the grain, or common unit of weight; but the inconvenience attendant on the use of separate sets of weights has long been complained of, and it is sets of weights has long been complished of, and it is to be hoped that one comprehensive system will soon be introduced. It seems very absurd to compel a chemist and druggist to use one set of weights in buying and selling medicines, and another in making up prescriptions. In each system there is a pound and an onnee; but the apothecaries' pound contains 1,240 grains less than the avoirdupois pound, and the apothecaries' ounge contains 424 grains were than the to any superiors; but were united togother by the spirit of brotherly love.—Ref. Krone's Frà Dolcino and die Patarener, Leip. 1844; Neander's Church History; Mosheim's Ecclesiastical History, in Eccl. History.

Mosheim's Ecclesiastical History, in Eccl. Hist., were a sect of Mennonites which sprang up in the year 1664, simple and comprehensive manner, the value of each

denomination in apothecaries' weight, and the relation of these to each other :-

20 grains = 1 scraple = 20 grains.
60 grains = 1 drachm = 3 scruples.
480 grains = 1 ounce = 8 drachms.
5,760 grains = 1 pound = 12 ounces.

Measures of capacity are used for liquids in mixing medicines. The table employed is either wine measure or imperial measure. The minims, as the units of these systems are called, differelightly; that of wine measure being equal to about 95 of a grain of pure water at 60° F., and that of imperial measure being equal to 91 of a grain of the same fluid. In the latter system, which has of late been used in England, the relation between the fluid ounce and the solid avoirdupois ounce is much closer than in the former. The minim a multiplied as follows: is multiplied as follows:-

60 minims = 1 fluid drachm = 60 minims. 480 minims = 1 fluid ounce = 8 fluid drachms. 9,600 minims = 1 pint= 20 fluid ounces. = 8 pints. 76,800 minims = 1 gallon

In prescriptions, the weights and measures are generally expressed by signs or symbols, with Latin numerals affixed. These signs, with the Latin and English words which stand for them, are given be-

m Minim, doth part of a fluid drachm.

gtt Gutta, a drop.

9j Scrupulus, a scrupie.

Drachma, a drachm.

13j Fluid drachma, a measured drachm.

Uncia, an ounce (480 grains).

13) Fluid uncia, a measured ounce.

Ibj Libra, a pound (5,760 grains).

Oj Octarius, a pint.

gr Granum, a grain.

Bemis, half, affixed to any of the above signs. The numerals j, ij, iij, iv, v, &c., show the number of grains, ounces, pounds, &c., to be taken; thus, mix denotes 60 minims, 3vii, 7 drachms, and 3j, 1 ounce.

APOTHECARY and APOTHECARISS ACT. (See CHE-

APOTHECIEY and APOTHECIEIS' ACT. (See CHEMIST AND DRUGGIST.)
APOTHECIA, ap-o-the-shi-a (Gr. apotheke, a repository), in Bot., the term applied to the spore-fruits of licheus. These contain the thecæ, or spore-cases, and occur either as little nodules and raised lines, or as round, shield-shaped, and cup-shaped bodies scattered over the fronds.

APOTHEOSIS, ap-o-the'-o-sis (Gr. apotheosis, a deification), in ancient Myth., is a term applied to the change which a mortal was supposed to undergo when he was raised to a god. Among the ancient Greeks and Romans, there prevailed a belief that certain of their heroes were, after death, raised into the order of their neroes were, after death, raised into the order of the gods; as Hercules, Romulus, Julius Cæsar, &c. In later times the term was more especially used to signify the ceremony by which the Roman emperors were defied after their death. It was in this manner:— A waxen figure representing the dead man was made, A waxen figure representing the dead man was made, and placed on a lofty ivory couch in the vestibule of the palace. For seven days it was regarded as sick, and attended by physicians. When considered dead, it was carried to the old forum, where hymns and songs were sung in praise of the deceased. It was afterwards taken to the Campus Martius, and deposited in a wooden erection four stories in height, and richly adorned with hangings, pictures, gold and ivory images, &c. Fire was applied to the edifice, and while it was supposed to carry the soul of the emperor up to heaven, after which time he was worshipped with the other gods.

APPARENT, "ip-par'-ent (Lat. apparere, to appear), an expression used in Astron. to denote things as they an expression used in Astron. to denote things as they seem to be to an observer, in contradistinction to their actual or real state. The term is applied principally two persons at once, and which was afterwards visible at to diameter, distance, figure, and motion. The apparent diameter of a body is the angle formed by two lines drawn from opposite points in the circumference of its disk to the eye; and the apparent magnitude of a body is similar, being the angle formed by two lines it the appearance of a woman to himself and others in 100

drawn to the eye from its opposite extremities. The apparent diameter and magnitude of bodies vary ac-cording to their distance from the eye. Apparent distance is the distance at which we judge or imagine heavenly bodies to be from us. The appearent distance of the heavenly bodies appears to us to be the same, or nearly so, in all cases, though really so widely different. Apparent figure is the shape which an object presents when viewed under different circumstances. Apparent conjunction is when one heavenly body comes directly in the line between another heavenly body and the eye of an observer. The apparent horizon is the circle which appears to bound the view on all sides, seen most perfectly at sea. Apparent noon at any place is the time when the sun is on the meridian of the place, in contradistinction to true or mean goon, when the sun would be on the meridian if it moved in its apparent orbit with uniform velocity. Apparent motion is that which bodies appear to have to an observer who is himself also moving. The motions of the sun in the heavens are apparent motions.

APPARENT TIME. (See TIME.)

APPARENT, HEIE. (See HEIE APPARENT.)

APPARENT, HEIR. (See HEIR APPARENT.)
APPARITION, &p-pù-rish'-on (Lat. apparere, to apparen.—Phantoms or spectral appearnnees, assuming various forms, in many cases those of departed relatives and friends, which have become visible to the beholder under different circumstances, leading them to believe that they have actually seen the disembodied spirits of those who have been removed from earth. To assert that such visitations are impessible, would be to deny the omnipotence of God; but, in the great majority of recorded cases, it is difficult to assign a sufficient reason for the aunearance of the phantom: majority of recorded cases, it is difficult to assign a sufficient reason for the appearance of the phantom; and a well-regulated mind recoils from the idea that such things would be permitted by the Almighty, unless He wills to work through such agency for some good and beneficent end. While the belief in the possibility of the appearance of apparitions is perfectly justifiable, and may be supported by passages from Holy Writ, for the apparition of Samuel was raised, unexpectedly perhaps, by the Witch of Endor, and recognized by Saul, yet the greater number of stories of spiritual or ghostly appearances that have been related, may be traced to a discased and disordered state of body acting on the brain, through the nerves, exciting certain impressions and sensations in nerves, exciting certain impressions and sensations in a manner so vivid, that those who have experienced these sensations, resulting entirely from an unhealthy state of the system, have beheved, without doubt, that the impressions produced have positively been brought about from the actual vision of those objects which an excited imagination has pictured. Dr. Samuel Hibbert has advanced a theory that these spectral appearances are entirely the result of an abnormal condition of the organism of those who see them, and that they are visible only to those labouring under some temporary derangement of the system, or who have become weakened by illness, or by any means which have caused a reduction of the natural strength of the body, producing a corresponding injury of rational mental power. He substantiates his theory by the case of Nicolai, a bookseller of Berlin, a man of highly imaginative powers, who, after an illness, saw continually whole troops of spectres about him, and even fancied that he heard some of them speak to him. There are, however, many cases, dismissing all those caused by over-indulgence in eating and drinking, fear, and a morbid state of the brain, in which persons same in body and mind, whose veracity cannot sons same in ody sam mind, whose veracity cannot be questioned, have seen apparations, and at such times when it seems but too probable that they should have the power to appear; yet it may be with justice asserted in support of the theory above mentioned, that even in these cases, the truth of which it is so difficult to question, the phantom has been seen by one person only, and may consequently be considered as an illusion of the brain; but how can Dr. Hibbert's

# Appeal

3665. One day visiting a family residing near Launceston, he found father, mother, and son, in a state of the elepest dejection; on inquiry, he discovered that the son asserted that he saw, in a certain field, every day, when crossing it on his way to school, the apparition of a woman. This the parents disbelieved, thinking the attachment to be fabricated by the boy to escape attendance at school. He persevered, however, in declaring his story to be true, and the finister offered to visit the field in which the occurrence was said to take place, in comment with the box be did so, and the anestre in company with the boy; he did so, and the spectre was visible to both; he then persuaded the parents to come to the spot with himself and their son, when the apparition was distinctly seen by these four witness and recognized by the parents as the apparition of a woman who had formerly lived in the neighbourhood, white a dog which had accompanied them, ran away in abject terror. The clergyman, at another time, held some conversation with the spirit, after which it never again appeared; but it is to be regretted that he had arepugnance to record what had passed between them.

—Ref. Ennemoser's History of Magic; Dr. Hibbert's

Sketches of the Philosophy of Apparitions; English

Cyclopadia—Arts and Sciences.

APPEAL, &p.peel' (Fr. appeler), in Law, is the re-moval of a complaint of an inferior to a superior court, being in the nature of a writ of error. The House of Lords is the superior court of appeal to rectify any injustice or mistake in law committed by the courts The Lord Chancellor has jurisdiction in appeals from the inferior equity judges. The Lords Justices form a court of appeal from the judgments of the master of the rolls, vice-chancellors, and inferior equity tribunals, and commissioners in bankruptcy. chequer Chamber forms a court of error in judgments given by the three courts of common law at West-minster, and is composed of the judges of two of the courts below, not parties to the judgment supposed to be erroneous. The Judicial Committee of the Priny Council sit on appeals from the ecclesiastical courts, the Admiralty, and from the colonies. The full court of Probate hear appeals from the court of the Judge Ordinary. In matters cognizable by justices of the peace, an appeal (unless prohibited by statute) lies to the Quarter Sessions, and now, by 20 & 21 Vict. c. 43, an appeal from their judgments or decisions on points of law may be had to one of the superior courts of law at Westminster. In certain cases in the County Courts appeals are made to a similar tribunal, and in cases of probate entertained therein, to the court of Cases of probate entertained distance of the Probate, whose decision is final. The court of Queen's Bench has jurisdiction over justices of the peace and the court of Quarter Sessions by certiforn; (which see). The court of Common Pleas decides disputed cases before revising barristers on the claims of voters for members of parliament. The archbishop of each pro-vince is the judge of appeals from the archdeacons' and consistory courts.

APPEABANCE, ap-peer'-ane (Lat. appareo, I appear or give attendance). In Law, the term appearance has reference to an ancient state of practice, by which the litigant parties personally, or by their respective attorneys, actually confronted each other in open court. The object is now effected by the party causing a minute or memorandum to be filed in the office of the court, which he may do in person or by his attorney. appear in person, he must state on the minute his address, in order that he may be served with any sub-sequent proceedings. If a writ be served on a defendant, he must cause an appearance to be entered for him within eight days, inclusive of the day of service; otherwise, the plaintiff may sign judgment against him by default. But if the action be brought to recover money on a bill of exchange or promisory note, the defendant is not allowed to enter an appearance unless he obtain leave from a judge within twelve days after the service of the writ, inclusive of the day of service. Leave can only be obtained on an affidavit of facts sufficient to convince the judge that the defendant has a good defence against the whole or part of the claim upon the merits.

upon the merits.

APPELLATIVE, #p-pel'-lā-tio (Lat. appellatio, a naming), in Gram., denotes a common, as distinguished from a proper name. An appellative is applied to a whole class, a proper name only to an individual; thus,

# Apple

city is an appellative, and London, Paris, and Vienna proper names

proper names.
APPENDANT, öp-pen'-dönt (Lat. appendems, hanging, fixing, or fastening to), in Law, is a thing of incorporeal inheritance, belonging to snother inheritance that is more worthy; as an advowson, common, court, or the like, which may be appendent to a manor; common of fishing appendant to a freehold; land appendant to an office; a seat in a church to a house. Ker. Co. Litt. 121.—(See APPURTENANCES.)
APPENDIX, åp-pen'-dix (Lat. ad, to, and pendeo, I hang), is something appended or attached to another, In Lit., it is applied to a supplements notes, or remarks placed at the end of a work! In Anat., it denotes a part attached to, yet in some measure distinct from another.

APPRICEPTION, by per-sep'-shon (Lat. ap, for ad, to, perceptio, perception), is a term applied in Phil. to that state or kind of perception which reflects upon itself, by which we are conscious of our perceptions and can reflect upon the operation of our own minds. The term

was first introduced by Leibnitz.

APPRITE, &p-pe-tite (Lat. appeta, I desire), denotes a desire of enjoying something that is apprehended or felt to be necessary or conducive to happinended or left to be necessary or conducte to hapfiness. In its primary sense, and as used by the Latins, it comprehended every species of desire, whether of a mental or corporeal nature; now, however, it is usually applied only to corporeal desires. According to Dr. Reid, "Every appetite is accompanied with au uneasy sensation proper to it, which is strong or weak in preparation to the desire we have of the chieft uneasy sensation proper to it, which is strong or weak in proportion to the desire we have of the object. Appetites are not constant, but periodical, being sated by their objects for a time, and returning after certain periods. Those that are chiefly observable in man, as well as in most other animals, are hunger, thirst, and lust." Appetites are distinguished from passions in being directed to general objects, while the latter are directed to special objects. Thus we speak of an appetite for fame, glory, or riches. They are also distinguished from passions in the latter having no existence till a proner objected be presented; whereas distinguished from passions in the latter having no existence till a proper objected be presented; whereas the former exists first, and then is directed to an object. Natural appetites are given for the preservation of the individual or the propagation of the species. In a moral point of view, there is neither virtue nor vice in acting from natural appetite; yet there may be much of either in the management of the appetites. Resides the appetites. Besides the appetites which nature has given to us for useful and necessary purposes, we may create others which nature never gave, and which are often very hurtful. Appetites seek their gratification without the aid of reason, and often in spite of it. In common language, the term frequently means hunger.

Appian Way, dp-pi-dn, the oldest and most celebrated of the Roman roads, was commenced by Appius Claudius Cacus, whilst censor, 313 B.C. It formed the great line of communication between Rome and Capus, and was 125 miles in length. In the conand capus, and was 125 miles in length. In the construction of this great highway, hills and solid rock were pierced, hollows filled up, ravines spanned by bridges, swamps covered with embankments, and so stupendous was the whole design, so vast the sums expended upon it, that it became known as the "queen of roads." Large portions of the Appian Way may still be seen at Terracina, and other places, and all those travellers that have described it, concur in praising its excellent workmanship.

ing its excellent workmanship.

APPLAUSE, dp-plauz' (Lat. ad, to, and plaudo, I clap my hands), properly signifies an approbation of something, expressed by clapping the hands. The ancients distinguished it from acclamation, which was expressed by the voice. Among the Romans there were three different kinds of applause; viz., bombus, which was a confused noise, made either by the hands or mouth; and imbrices and leate, made by beating a sort of sounding vessels placed in the theatres for that purpose. Persons were instructed in the art of giving applause, and there were masters for teaching it. Proficients let themselves out for hire to actors and others, and were disposed among the audience, so as to give it with effect. They were divided into chors, and placed opposite to each other, like the choristers in a cathedral.

APPLE, dp'-pel (Ang.-Sax. appl), the fruit of the

## Apple of Love

Pyrus Mahu, a tree belonging to the nat. ord. Rosacea. (See Praus.) All the different kinds of apple-trees now in aultivation are usually regarded as mere varieties of the one species which in its wild state is known as the crabtree. This plant is a native of Britain, and is found in most of the temperate parts of the northern hemisphere. Its fruit is austere and uneatable, but is sometimes collected for the sake of its acid juice. nemisphere. LEXTULE is austere and unestable, out is sometimes collected for the sake of its acid juice, which, when fermented, forms the liquid called veryince, used in cookery and for purifying wax. The cultivated tree was probably introduced into Britain by the Romans, who are said to have had twenty-two varieties. At the present time it is, perhaps, the most widely-diffused and most valuable of all fruit-trees; and the varieties, which are adapted to an trutterers; and the varieties, which are adapted to almost every soil, situation, and climate in the temperate zone, have become extremely numerous. The apple-tree seldom reaches a greater height than thirty feet; but its large round head makes up for the want

of height; and, altogether, it is a noble-looking tree, especially when in full blossom. The flowers grow in

bunches, and are very fra-grant. They are white inside, and delicately tinged

trained as an espalier, or as a wall-tree. New varieties are continually being developed; and, as they are ge-

nerally propagated by grafting, the old ones gradually

die out. The variety that produced the costard, which was formerly a favourite kind of apple, does not exist





at the present time, though we still retain the name AFFLE AND BLOSSOM. of costermongers (costard-mongers) for itinerant sellers of apples. The apple is usually grafted on apple or crab stocks; but sometimes hawthorn stocks are used. For producing dwarf trees, stocks of the paradise apple, a very diminutive variety, are generally employed. The apple (we now allude to the fruit, and paraguse appie, a very unmustry and apple of the apple (we now allude to the fruit, and not to the tree producing it) varies greatly in size, form, and colour. It is regarded by botanists as the type of the kind of fruit to which they have applied the term pome. (See Pome.) The catable part has a more or less aromatic, sweet, or sub-acid taste, and contains starch, grape-sugar, and make acid. Apples are commonly divided into dessert, baking, and cider fruits, the first being highly flavoured, the second such as become soft in baking or boiling, and the third those which are hard and austere. Apples are also classed under the general names of Pippins, Pearmains, Rennets, Calvilles, Russets, Codlins, &c. Large quantities of apples are imported into Eugland from France, Canada, and the Northern States of America. The uses of the apple,—for the dessert, for puddings and pies, for preserving and making jelly, are suffi-ciently well known. Cider the fermented juice of the apple, is a favourite drink in many parts of Ragland and France. Malic acid, extracted from the apple, has long been used in medicine, and has latterly been

has long been used in medicine, and has latterly been largely employed as a mordant in dyeing. (See CIDER, MAILC ACID.)—Ref. For recipes, Mrs. Becton's Book of Household Management.

APPLE OF LOVE. (See TOMATO.)

APPLIBEREY. (See BILLABDIBRA.)

APPLIBMOTH (Curocopa pomonella), one of the most destructive enemies of the apple crop in this country. It lays its eggs in the eyes of the newly-formed fruit, within which the larva feeds. The result is the presenting failing of the apple. is the premature falling of the apple.

APPLES OF SODOM. -A name given to a fruit, of somewhat fabulous properties, growing, or supposed

to grow, "Near that bituminous lake where Sodom stood," Josephus, in describing it, eudows it with many mar. Appraisements made for legacy duty are exempt, but wellous characteristics; such as, that, on the fruit not if made for increase or return of probate duty.

# Appraisement

being plucked with the hands, it is dissolved into smoke and ashes. Hasselquist supposes that the Apples of Sodom are to be found in the fruit of the Solomum Melongeno (Nightshade), which he describes as filled with dust and ashes: he saw it in abundance in the vicinity of the Dead Sea.

APPOGIATURA, op-poj-a-too'-ra (Ital. appogiare, to lean upon), in Mus., a small note which precedes a larger one of greater duration, and which is touched lightly before sounding the principal note. The small note borrows one half, and sometimes only one quarter,

note porrows one nail, and sometimes only one quarter, of the duration of the note preceding it.

Appointment, ap-point-ment (Fr. appointment, from Lat. ad punctum, to a point), in Law, is generally considered as one of the common-law conveyances or modes of disposition, and is a deed, will, or instrument of a derivative nature, relative to or dependent ment of a derivative nature, relative to the expensions on some precedent deed or sastrance, in which a power to appoint to certain uses, or in favour of particular persons, or to divert the property or fund into such channels as the appointer, by the power given, is anthorized or enabled to do. It is also a term used in bankruptcy on the choice of assignees, who are in bankruptcy on the choice of assignees, who are thereupon appointed; and in arbitration cases, on the choice of arbitrators, &c. The term is also applied to an office, employment, or place of profit, which is called an appointment, and to the set of investing with or placing a person in an official employment or emolument, which is called an appointment thereto.

APPOLD'S CRETRIFUGAL PURP. (See PURP.)
APPORTINIMENT, &p-portioner, from Lat. apportioner, from test (Lat. apportioner, from Lat. adportionern, to settle the share, part, or allotment of each), in Law, is a dividing of rent or income into parts, according as

with pink externally. The tree is not always permit-ted to ramify in a natural manner, but is sometimes is a dividing of rent or income into parts, according as the land out of which it issues is divided among two or more; as, if a stranger recovers part of the land, the tenant shall pay, having regard to that recovered and what remains in his hands; but, in general, a rentcharge, or things that are entire, cannot be made the subject of apportionment; and, by 4 & 5 Will IV. c. 22, it is provided that in cases of all fixed periodical payments, payable under any instrument executed when the interest of the recipient determines, by death or otherwise, the payments shall be apportioned so that he or his representatives, and the person entitled by succession or reversion, or in remainder, shall have their respective proportions up to and from the time at which the prior title or interest ceased. does not apply to reat reserved by lease of lands or tenements, as the party liable under the lease is still to make a servent of the children and the lease is still to make a servent of the children as the lease is still to make a servent of the children as the lease is still to make a servent of the children as the to make payment of the whole to the party who would be entitled if the statute had not been made; the latter, however, being liable to account to the person claiming the apportionment.

APPOSITION, Sp-po-sish-on (Lat. ad, to, and pono, I place), denotes literally the set of putting or applying one thing to another. In Gram, two or more substantives are said to be in apposition when they are in the same case, without any copulative conjunction be-

APPRAISEMENT, ap-praiz'-ment (Fr. apprécier, to value, set a price upon).—The act of rating, valuing, or setting a price on estates or effects, or dilapidations or repairs, by a person who is a competent judge, and who, for certain purposes, must be licensed. When a distress is levied for rent, before the goods can be sold to satisfy the distraint, the distrainer must cause them to be appraised or valued by two appraisers, who must be previously sworn by a constable to put a true value on them according to the best of their judgment. In accounting for legacy duty, the commissioners of inland revenue require an inventory and appraisement of goods or property remaining unsold, in order to ascertain the value upon which the duty in respect thereof shall be charged, which inventory is retained by them unless it be stamped. The duty psyable on appraisements is as follows :-

Valuatio	n not exceeding	£50 2 6	
,,	,,	100 6 0	
,	39	200 10 0	
**	If arounding	500 15 0	

APPREHENSION, Appre-her'-show (Lat. ad, to, and grehendo, I seize or lay hold of), literally signifies the taking hold of or grasping with the hand. In Phil, it is applied to that ect of the mind by which it conceives of a thing without passing any indigment upon it. Hence it is used to express an inadequate or imperfect idea of a thing, and is opposed to comprehension. There are many truths which we apprehend, but which we cannot comprehend; as the great markains of the contraction we cannot comprehend; as the great mysteries of our faith. "It belongs to the ides of God that he may be apprehended, but not comprehended by his reasonable creatures." If he were not so, he would not be God, or the being that comprehended him would be God

APPRENTICE, dp-pren'-tis (Fr. apprendre, to learn).— In Las, apprentices are usually bound by indentures for in Law, apprentices are usually bound by insentures for a term of years, with their own consent, without which the transaction is not binding, except in the case of parish apprentices, who may be bound with the consent of two justices till twenty-one years of age. A variety of statutes regulate the manner in which parish apprentices are to be bound, assigned, registered, and maintained. This subject is now placed under the paramount custody of the poor-law commissioners, who have power to introduce new rules from time to time as they may think fit; and provisions are made by which justices of the peace are empowered to settle disputes between such apprentices and their masters, and to discharge the former from their indentures upon reasonable cause shown. Similar powers also belong to the justices in the case of all other apprentices. They may commit them to prison for three months for breach of duty, in cases in which not more than \$25 premium is paid. In usual cases, the terms are arranged between the master and the friends of the apprentice, as to the hours of service and maintenance, and remu-neration of the apprentice. A master cannot legally compel his apprentice to work an unreasonable length of time, to do an unlawful act, or to work on Sunday. The bankruptcy or death of the master is a discharge of the indentures. But by the custom of Loudon, it a master die, the apprentice is bound to continue his services to the widow, provided she carry on the same trade; and by the like custom a freeman may turn over his apprentice to another freeman. If in the indentures there be any covenant by the master or friends of the apprentice for maintenance, the executor or administrator of the deceased party is bound to make provision for the same as far as the assets will allow. A master may administer reasonable corporal chastisement to his apprentice for a breach or neglect of his duty, but he cannot discharge him. It is, however, advisable for the master to apply to the justices rather than take the law into his own hands. He may bring an action against the parent or other person who has by the indenture agreed for the due performance of the stipulations. There is no remedy by action against the apprentice himself, if he be an infant, except by the custom of London. An action lies by the master for enticing away or harbouring his servant or apprentice. An apprentice is not liable to serve his master Thee. An apprentice is not manie to serve in answer after he attains twenty-one years of age; but the master has his remedy over against the party who has covenanted that the apprentice shall serve his time. If the premium be less than £10, and the apprentice absent aimself from his master's service, he is liable to serve havened his team for as long a time as he shall have beyond his term for so long a time as he shall have absented himself, or make satisfaction, or be imprisoned for three unonths; and the renedy is cumulative. The apprentice is entitled to the indenture bearing the stamp-duty chargeable in respect of the premium. It has been lately decided by the court of Queen's Bench that the widow of the master of an apprentice, if executrix and able to teach the apprentice, is entitled to his service.

APPROACH, ap-proche (Fr. opprocher), a term applied to the covered road or treach made by a besieging army to approach the walls of the fortress, without army to approach the walls of the fortress, without being exposed to the enemy's fire. Approaches consist generally of trenches excavated in the ground, the earth being thrown up on the side next to the fortress. Approparion, åp'-pro-bai'-shom, is that act or disposition of the mind by which we assent to a thing with some degree of pleasure or actisfaction. Moralists are

divided as to the motive which determines us to approve

or disapprove. According to some, it is self-interest; according to others, sympathy. According to Dr. Reid, it includes "not only a moral judgment of the action, but some affection favourable or unfavourable towards the agent, and some feeling in ourselves." In some cases the feeling predominates; in others the judgment is more prominent.

is more prominent.

APPROPRIATION, the pro'-pri-ab'-show (Lat. appropriatio, applying or taking to one's own use).—In Law, a parson has, during his life, the freshold, in himself, of the parsonge-house, the glebe, the tithe reut-charge, and other dues; but these are sometimes appropriated; appropriation, therefore, signifies the perpotual annexing of a benefice to some spiritual corporation, either sole or aggregate, being the putron of the living or heareflee.

APPROVER, dp-proof-per (Lat. probator, prover), is a person who, indicted of treason or felony, and arraigned for the same, confesses the fact before ples pleaded, and appeals, or accuses his accomplices of the same crime, an order to obtain his pardon. He has to take an oath to reveal all treasons and felonies that he knows of. to reveal all treasons and felonies that he knows of. The accomplice, or appelles, is equally bound to answer it; and if he has no reasonable and legal exceptions to make to the person of the approver, he must be tried, and, if found guilty, suffer judgment, and the approver shall have his pardon at debit justities. If the appelles be acquitted, the approver receives judgment for the crime confessed, the condition of his pardon having failed; viz., the convicting some other person. The doctrine of approvement has fallen into desuctude, and the object is attained by admitting one accomplice as a witness for the crown, or, as it is commonly called, queen's evidence against the others. (See EVIDENCE.) Bailiffs of lords, in their franchises, are called their approvers; and in the statute | Edw. III. c. 8, sheriffs are called the king's approvers.

APPROXIMATION, &p-prox'-mail-shon (Lat. ad, to,

APPROXIMATION, ap-prox't-mail-shon (Lat. ad, to, roximus, vext), in Arith, and Alg., the coming nearer and nearer to a root or other quantity sought, without finding, or expecting to be ever able to find it exactly, the operation employed to discover a quantity that can-not be positively determined. It is most frequently used to find the bi-quadrate and cube roots of numbers that would leave a remainder when the nearest bi-quadrate or cube root was found. By approximation the value of a quantity may be found, if not to the utmost degree of exactness, sufficiently so for practice; thus:—  $\sqrt{2} = 1.41421356$ , &c. = the approximating series  $1 + \frac{1}{160} + \frac{1}{1600} +$ 4x-3+2x-4+, &c.

APPUI, ""p.pue" (Fr., support, prop), in Mil., a term applied to any particular point or body upon which troops are formed, or by which they are marched either

troops are tormed, or by which they are marched either in column or line. This is termed the point d'appui. Appurtenances, dp-pur-te-nân-see (Lat. pertineutiu; Fr. appartenir, to belong to), in Law, are things, both corporeal and incorporeal, appertaining to another thing as principal; as, hamlets to a chief manor; and common of pasture, piscary, &c.; also liberties and services of tenants, and outhouses, yards, orchards, and gardens, are appurtenant to a house or messuage. (See Appendant) (See APPENDANT.)

(Oce APPENDARY.)

APRICOT, al'-pri-kot (Lat. præcoz, blossoming early),
the popular name for Prunse Armenioca, a fruit-tree
belonging to the same gen, as the plum. It is a native the popular name for Prunus Armssiaca, a fruit-tree belonging to the same gen, as the plum. It is a native of Armenia and the countries eastward, to China and Japan. It blossoms at the very commencement of spring, and bears a fruit resembling the peach, but with yellow fiesh. It appears, from Turner's "Herbal," that the apricot was cultivated in Britain in 1562; and in Hakluyt's "Remembranes", 1852, it is affirmed that it was first brought here from Italy, by Wolfe, a French priest, gardener to Henry TIII. Upwards of twenty varieties are now in sultivation. The trees are generally budded on plum stocks and trained against walls. The dried fruits are exported from Italy and the south of France. and the south of France.

Arran, ai-pril (Int. Aprills, from aperio, I open), is the fourth month of our year, and was so called from the earth beginning at this time to open her bosom for the production of fruits. It contains thirty days.

## A priori.

A raiser, pri-or'-i, is a term in Logic, taken from the Latin, and signifying, literally, 'from a thing before,' as opposed to a posteriori, 'from a thing after.' They distinguish the two different methods of reasoning, the former being applied to arguments from cause to effect, the latter from effect to cause: the one lays down some previous self-evident principles, and then descends to the several consequences that may be deduced from them; the other begins by regarding the phenomena themselves, traces them to their original, and, by developing the properties of these phenomena, arrives at the knowledge of the cause. In modern times, the term à priori has come to be extended to any abstract reasoning from a given notion to the conditions which such a notion involved; as, for example, the title à priori bestowed on arguments for the existditions which such a notion involved; as, for example, the title d priori bestowed on arguments for the existence of deity, drawn from the phenomens that we observe around us: thus, Clarke's à priori reasoning for the existence of God is, properly, an argument à posteriori. Kant applies the term à priori to knowledge which is absolutely independent of all experience, as opposed to empirical knowledge, or knowledge derived à protection; through experience, In this same as opposed to empirical knowledge, or knowledge derived à posteriori, through experience. In this sense, the terms are now commonly used by philosophers. "If there are any truths which the mind possesses, whether consciously of unconsciously, before and independent of experience, they may be called à priori truths, as belonging to it prior to all that it acquires from the world around. On the other hand, truths which are acquired from observation and experience, are called à posteriori truths, because they come to the mind after it has become acquainted with external facts. How far à priori truths or ideas are possible, is the great compus philosophorum, the great controverted question of mental philosophy."—Thomson's Lawe of Thought.

Arenders, devisites (Gr. apsis, arch, connection),

APRIDE, dp'si-dees (Gr. apsis, arch, connection), the points in the orbit of a planet, or any heavenly body, at which it is at its least and greatest distance from the sun or body round which it revolves as a centre. from the sun or body round which it revolves as a centre. The appaies of a planet are its aphelion and perihelion, and those of the moon its apogee and perigee. The diameter of the planet's orbit, which joins these extreme and opposite points, passing through the centre of the same,—the sun in the case of the planets, and the earth with reference to the moon,—is called the line of appsides or apsea. This line always forms the greater axis of the ellipse in the path of which any planet revolves. (See APHELION, PERIHELION, APOCAR PERINGEN.) planet revolves. GRE, PERIGRE.)

APPEAL, &p-te-rat (Gr. a, without; pteron, a wing), in Arch., a term used particularly with reference to the temples of the ancient Greeks and Romans. It is applied to buildings which have no lateral columns, is applied to buildings which have no lateral columns, but may have portices of columns projecting from their ends. The Greek temples were, for the most part, peripteral, as the parallelogrammic temples of the Romans were generally apteral prostyles. The latter style has been most frequently adopted in modern edifices.

APTEREX, apt-to-rix (Gr. a, without; pterux, wing),



APIERYI.

## Aquarium

perhaps, more nearly to the extinct dode. It has a long spike-like bill, of which it makes use in supporting itself when at rest. Its wings are simple radiments,—a mere sump, terminated by a hook. Its feathers fall loosely, like those of the smu. Only one species is known, about the size of a goose, a native of New Zealand. The name kins-kive is given it by the natives, who use its skin in making clothing.

AQUANORITS, ai'-qui-for'-kii (literally, strong water), the common name for the impure nitric acid of com-

AQUAGE, di'-kwaj (Lat. aquagium, from aqua, water), a water-course.

AQUAMARINE, or BERYL, ai-qua-ma-reer', a precious stone, of a greenish-blue tinge, much valued as a jewel, from its lovely colour and great hardness. It is cometimes yellowish, and occasionally almost colouriess. Its finest crystals come from Brazil and Siberia. The opaque aquamarine is greenish or yellowish white, and is found in North America, in prisms four feet long, their planes being five inches in breadth. At Limoges, in France, they also occur of great size. The beryl is closely allied to the emerald, both being double silicates

closely allied to the emerald, both being double ellicates of alumina and glucina, and differing only in their colouring matter, which is oxide of iron in the beryl, and oxide of chromium in the emerald.

AQUA KRGIA, ai\*.kwa re\*-ji-ā (Lat., royal water), in Chem., a substance, called, from its property of dissolving gold, the royal metal; the commercial name for nitro-hydrochloric acid. It is made by mixing one part of nitric acid with two or three parts of hydrochloric acid. The acids decompose each other, chlorine and nitrons acid being liberated, the former of which attacks the acid or other netal acted mon. forming sublocks the gold or other metal acted upon, forming a chloride. It is much used by chemists, as a solvent for gold, platinum, iridium, osmium, and other metals.

AQUARITM, ai-quair-i-um, a vessel containing water, either salt or fresh, in which living specimens of aquatic animals and plants are maintained in a healthy state. The words vivarium and aquavivarium have been employed by certain writers to denote the same been employed by certain writers to denote the same thing. Aquaria, both fresh-water and marine, have become exceedingly common, and numerous works have been written on their management. As many of these treatises are utterly untrustworthy, having been compiled in haste, by men knowing little or nothing of the habits of the creatures adapted for squarta, a few practical directions for stocking and keeping up these pleasing and instructive arrangements will doubtless be acceptable to many readers of this work. Before entering into practical details, we will briefly sketch the history of the aquarium, and describe the principles upon which it depends. To Mr. Warrington must be gwarded the thanks of all leaves of the state must be awarded the thanks of all lovers of nature, for having first produced a perfect aquarium. In 1850 this gentleman communicated to the Chemical Society the result of a year's experiments " On the adjustment the result of a year's experiments. On the adjustment of the relations between the animal and vegetable kingdoms by which the vital functions of both are permanently maintained." To illustrate this adjustment, Mr. Warrington kept for many months, in a vase of unchanged water, two small gold-fish and a plant of Valiencies spiralis; and afterwards he made a similar experiment with sea-water, weeds, and anemones, which was equally successful. Before this, several attempts had been made to preserve fresh water and marine organisms by naturalists. Mr. Ward, whose ingenious discovery of the method of growing ferns and other delicate plants in closed cases (see Wardian CARE) had already earned for him a world-wide repu-tation, stated, as early as June, 1849, at a meeting of the British Association, that he had succeeded of the British Association, that he had succeeded not only in growing sea-weeds in sea-water, but in sea-water artificially made. Seven years earlier, Dr. Johnston succeeded in preserving the delicate pink coralline in a living state for eight weeks, in unchanged sea-water. The list of workers in the aquarium cause would be incomplete without the name of Mrs. Thynne, a lady living in London, who frequently surprised the scientific societies by exhibiting beautiful specimens of rare marine animals which she had kept for many months. having mersly adorated the simple for many months, having mersly adopted the simple expedient of serating the sea-water, by pouring it from one vessel into another. Before Mr. Warrington one vessel into another. Before Mr. Warrington s gen, of birds allied to the ostrich and omu, and, published his paper, Dr. Lankester had kept sticklo-

# Aquerium

backs, gold-fish, and other fresh-water saimals, in jars containing growing sparies of Valueria. It closes, the well-known marine scolegies, also abouted in the same field, and his efforts to demesticate his favourity sea-anomous were tolestify successful. The fact of his being ignorest of Mr. Warrington's experiments proves that science had already smoothed he way to the discovery of this healthy contrinces my minversally known as the squarium, by the aid of which the naturalist, sitting in his parlour or conservatory may study the natural habits of the strange and interesting inhabitants of the deep.

The great principle involved in the aquarium is the constant interchange of elements between the animal and vegetable kingdoms. (See Animal Kingdom). Water has the power of absorbing certain quantities of atmospheric air and other gases. In every natural water, whether fresh or salt, we find a proportion of carbonic acid, which is a compound formed of oxygen and carbon. The leaves of plants, when acted upon by light, decompose this gas, and, having no necessity for oxygen, they merely absorb the carbon. Animals, on the other hand, require oxygen, for the purpose of removing the waste carbon of their bodies; and the process of respiration causes the two elements to combine in the form of carbonic acid. The vegetable world is therefore continually absorbing carbon, while the animal world is giving it of; and a balance is thus world is therefore continually absorbing carbon, while the animal world is giving it off; and a balance is thus preserved between the two great divisions of organized beings. The other elements which enter into the composition of animal and vegetable structures circulate in a more obscure manner, but with equal regularity. A vessel containing a supply of aquatic plants and animals must be looked upon as a little world, in which the interchange of elements represents those sast phenomens that preserve the halance of life in the great world; the few water-weeds take the place of the vast forests, the green prairies, and the dense jungles; and the gold-fish, minnows, newts, and snalls, stand for the earth's fauna. To form an aquarium, we have merely to imitate nature. A good supply of plants must be planted, to decompose the poisonous carbonic acid gas, and keep up a continuous supply of the vivilying oxygen; while particular care must be taken not to overcrowd the tank with animals.

The vessels used for aquaria are constructed, either late in a more obscure manner, but with equal regu-

taken not to overcrowd the tank with animals.

The vessels used for aquaria are constructed, either wholly or partly, of glass: a common propagating-glass, such as is used by gardeners, is often employed. These glasses can now be obtained, fitted with proper etands, and manufactured from a clearer kind of glass than formerly. Glass tanks, of a restangular form, are, however, preferable to vases, as they do not distort the objects seen through their sides, and are less liable to breakage. The glass rase is extremely fragile, and an unlucky blow ruins it at once, and, perhaps, destroys the labour of many weeks; whereas, a cracked side in a rectangular tank can be easily replaced. The most perfect form of tank is that invented by Mr. W. Alford Lloyd, and known as the "slope-back tank." One side only of this tank is formed of glass, the other three being composed of slate. The back slopes downwards, from the source of illumination to

## Aquarium

rilant, but it must be frequently thinned, as it grows extinemely fast. The different species of Duckweed (Longeton) state II ha different species of Duckweed (Longeton) are all applicable to the purposes of the aquaritim maturalist. He entire the state of the summats should be introduced into the tank until the plants have been established sufficiently long (say three or four days) to properly alreas the water. Of the animals satted for the fresh water tank, flahes rank flats. All the different kinds of Carp, including the gold-fish, are easily domesticated. The Teach, the Miller's thinnsh, the Minnow, the Stickeback, and the Grig Rei, are also suitable fish. The interesting class of Batrachia are generally represented by the common frog, the smooth next, and the created priton. Small water-tortoises and salamanders have lately been imported for aquaria. Some members of the class Molleco are absolutely indispussable in a fresh-water aquarium, as they act as scavengers, and carefully remove the green flux which fours upon the glass, and which, in their absence, would soon obscure the contents of the tank. The best mollasks are the pretty coil shells (Planorbic corners and contents), the marchcontents of the tank. The nest molecuse are the pretty coil-shells (Planobic correirs and opinions), the marsh-shell (Paladina viotpara), and the cared mud-shell (Linnea auricularis). It is doubtful whether insects ought to be admitted into aquaris which are intended merely for parlour ornsments; but the asturalist ought not to consider his tank complete unless the ought not to consider his tank complete unless the important class of insects is properly represented. Considerable care, however, must be bestowed on the selection, as some of the members of the bestle tribe are so bloodthirsty that they will even venture to attack the smaller fish. Some writers on the aquarism recommend artificial accation; but when the balance of vegetable and animal life is properly adjusted, there is no necessity for resorting to any extraordinary means to insure a company summly of overess.

is no necessity for resorting to any extraordinary means to insure a copious supply of oxygen.

The Marine Aquarium affords us the means of observing some of the most curious forms of animal life. The tank is filled with sea-metar, which should be conveyed to its destination in clean stone jars, or in casks perfactly seasoned. When real sea-water cannot be got at (though this emergency must now be a very rare one), artificial sea-water may be used, after having marine plants in it. Mr. Gosse has given the following simple formula for the preparation of this artificial sea-water: sea-water :-

Epsom salts founce.
Chloride of magnesium 200 grains troy.
Chloride of potassium 40

nnese materials are to be added to a little less than four quarts of water. The specific gravity of the solution, when properly prepared, will be found to be 1026. The green and red sea-weeds are the plants used, the dark-coloured weeds being inapplicable for aquarium purposes. (See Alex.) The animals which form the glory of the marine tank are the sea-enemones These materials are to be added to a little less than form the glory of the marine tank are the sea-enemones (see Arkmoxes) and madrepores. Besides these, the star-fishes, the sea-urchins, the barnedes, and the beautiful plumed worms called serpulse and sabelle, generally gain admission. The grab family famish the humorous element in the squarium; and it is impossible to observe the clumsy antics of some of them, particularly the hermits, with a serious countenance. tank." One side only of this tank is formed of glass, the other three being composed of slate. The back slopes downwards, from the source of illumination to the lower edge of the glass front, an arrangement which enables objects to be seen in a slanting light, which exhibits their form and colour to the greatest advantage. Whatever kind of tank is used, it should be provided with a cover of sheet-glass, to keep out dust, and to prevent the more advanturous creatures making their escape. A layer of well-washed single of sand is laid at the bottom of the aquarium, and in this the roots of such plants as are provided with these creatures in this the roots of such plants as are provided with these creating their escape. A favor of well-washed single of sand is laid at the bottom of the aquarium, and in this the roots of such plants as are provided with these creating their escapes. A favor of well-washed single of sand is laid at the bottom of the aquarium, and in this the roots of such plants as are provided with these creating upon the shingle, look much better than any isolostic minarets of sham reckwork, formed of cement, and afford sufficient shelter for all animals of a retaining disposition."

The fresh-water aquarium is filled with ordinary river or spring water, and serves to exhibit the animals and plants found in ponds and ditches. The best and most lasting plant is the spiral Valineria (Valineria spiral valineria (Valineria spiral valineria), which is a fine grassy-looking weed, having the creation and the cocan. The prevaluation was the rising and falling place in the occan. The prevaluation was to constantly falling place in the occan. The water, and consequently water to drip into it from a constantly of water to drip into it from a sensitive side to despute the constantly falling place in the occan. The water, and consequently water to drip into it from a constantly of water to drip into it from a considerable height; but

# Aguerios

it is far better to her within moderate finite for a po

printer, again for (Lat., water hearts), a calleding, and the serventh aga of the cades, is above to that part of the expire in which the sin the letter part of January and beginning of there, is may be found by drawing a line through stars in the cheed of Andromesch and wing of Per-physical sullpass through the stars in the shoulders guarden; at it also distinguished by four stars of carls magnitude, near the urn forming the letter The star is supposed to have been so called because waters is governey rainy when it appears on the Man.

hereists.

Agreeto Parris, d-quit it.—All plants growing in water may be termed agratic; but, by botanist, the term is nearly applied only to those found in fresh water, either stagnant or running; as, Sagittaria, serosimed. Hymphose, water lily; Potamogeton, pondward; Schulleria, evident: Utrioularia, hladderwort; Straffets; water-soldier; Lemna, duckweed; the Confession water water

Delow.
AUTHURA, of one fir'to (Lat. aqua, water, functus, stained or dred), a pagallar style of etching on copper or steal, is installed of drawings in sepis or Indian int. It was invented by a German named Le Prince;

Authentita, a specifier with of etching on copper or steel, in instead of drawings in sepis or Indian size. It was invented by a German named Le Prince; but, since the intendentian of tilhography and colour-printing, it has nearly fallen into disuse. The plate is covered with a ground of black reast and spirits of wine, to which the design is transferred, with a blunt restrangent, was the paper on which it has been traced. The high lights are then atopped out with a varials of Canada satism and wride of blumth; and the various bacies and gradations of tint are procured by submitting the different parts of the design to the action of mirro and and water for a greater or less period of sime, archering to the depth of shade required.

Actua Toplica, and to have been invented at the close of the 17th century, by's Palermitan woman, named Polant; indeed the term. This compound was retailed instead philate, is belied "Manns of Saint Nicholas of Bart, and was supposed to have a mirraculous power in curing various diseases. It as effect, however, was to till these the whole it was administered; on which these the whole it was administered; on which the was a supposed to have a mirraculous power in curing various diseases. It as effect, however, was to till these the whole it was administered; on which the was a supposed to have a mirraculous power to consect was discovered as the head of which was an old has normal finences to get rid of their husbands. In 1898, so gives was the mortality amongst married men, that a supposed was a washaned, and a horrible secret essent was a second of the woman Tolans field in the process to the suppose of which was an idea of which was an old has neared finence, who which several of the guilty companions. Was a reconsed. The woman Tolans field in 12th the first the second to the torture, concessed to favour been strangled. The second punishment directly and the survived in 12th the second punishment directly and the survived in 12th the survived which milited to cause death. The survi

period lead the the brief than it was a formulate of specific that the constant of the specific that again, which indicates, a channel of specific that again inclination, for the transmission of water from one place to abother. The term is generally applied to the archad bridge like structures of name constraints by the engineers of Rome to convey water across variety for the supply of the imperial city. Even many of the infrither sites of Lay, and release the first three streets of the manufactures of the convey water across variety for the supplied and release formulated by the Romans, were supplied

# esecutoliza

me hand, she present a more to an present my temporad upon for them of distillic crokes, the lower routinings the grand arches, and the upon district. The length of this arcade is 500 feet, the breadth AA, and the height 420. The account of Cassets, built in 1733 by Oharles 1111. of Naries, is also a giganisorizatione, the of its arcades consisting of these time of arches, 1/24 feet long and 190 feet in heaths. In France the aquednot which brings water to Moutpeller, perhaps, the most beautiful. It required thirteen years for its completion. The primapal access is 90 feet high, and consists of two times the toward containing 90, and the upper 210 arches. That of discussideserves next to be noticed. It was originally built by the emperor Julian, A.n. 360, to bring water to Faris, and supplied the palace and hot balls, but was destroyed by the Normans. After being in disage for 500 years, it was rebuilt in 1834; again separated in 1777; and fresh sums have lately been devoted to the same purpose by the city of Paris. The accordances the valley of Arcueil consists of 35 arches, is 75 feet high, and 1,200 feet in length. "The first squeenic bridges for causals in this country were those mode by high, and 1,200 feet in length. The first emediant-bridges for canals in this country were those made by the duke of Bridgewater under the direction of the celebrated Brindley, and which, being quite new, extend no small degree of astonisiment. The first and largest was the aqueduct at Barton Eridge, for conveying the canal across the Irwell, 30 feet shows the surface of the water. The Pont Dysylts equadout of Telford is justly celebrated for its magnitude, for the simplicity of the design, and the skillful disposition of the parts, combining lightness with strength in a degree seldom attempted. This aqueduct serves to convey the waters of the Ellesinere Canal across the Decand the Vale of Llangellen, which it traverses. The channel for the water is made of cast-iron, supported on cast-iron ribe of arches, and these resting on pillars, of stone. The whole length of the aquednet is about 1,000 feet, and consists of 10 arches, seek 45 feet span. of stone. The whole length of the aquedint is about 1,000 feet, and consists of 10 archet, each 45 feet span. The breadth of the pillars at the top is 8 feet, and the height of the four middle ones is 115 feet to the springing. The pillars have a slight taper, the breadth of the middle ones at the base being 15 feet. The wight from the surface of the water in the Dec to that in the canal was to be 126 feet 8 inches." (Pop. Encyclopedia.) At fig. 1, Plate VII., we give a drawing of this elegant structure. The remains of the aquedion at Nismas. in Provence, in excellent presentation, fursation. elegant structure. The remains of the aqueduce at Nismes, in Provence, in excellent preservation, furnish the best example of this class of ancient engineering works. It consists of three rows of arches raised one above another, each smaller than the one below it; the lowest of 6 arches, the centre tier of 11, and the uppermost of 35. The Pont du Gard, which crosses the valley of the Gardon, is 188 feet in height, the length of the highest arcade being 973 feet. It corresponds to the water of Hure to Nismes, and was carelland by the Romans in the reign of Augustus. At the 12-Plate VII., we have given a drawing of this colorator work. The Croton aqueduct convays scalar from the Croton river to New York, over a distance of 38-miles. miles.

AQUEOUS HUMOUR, at queous, in anat. Is the name given to that watery fluid of the eye which is simulated between the back of the cornes and the front of the AQUEOUS HUMOUR, al-que lens. (See Ern.)

AQUEOUS BOOKs, in Geol., are those which have been formed by deposition from white; it either words, they are the sedimentary or straighted social. The unstraided rocks which have arisen through the one, are series, in contradistinction, igneous.

contradictinction, spacers.

Aquirotlicza, ai-quayfr-limines (Lat. squa, water: folium leaf), in Bot, the Holly fam., a nat. erd. of dicotyledonens plants, in the sub-dust Corolliform. They are everyseen trees or strains, with corticors and simple leaves, which have magnipules. The folium are small, spillery, and sometimes unisexual:

the fruits dashy and indahinesse, genera and one bounded and has widely, although quantingly, distrib-Only one species, filt agreemen hells.

Billow, tartie, was interrupted presented are commonly possessed by plants of late Golder. Brane and acceptance to the Golder. Brane are another and paragraph and as authorized for Childre the Like, engle), in Astron., the remains of a commonly file flate, engle, in Astron., the remains of a commonly of the middle of September. The constitution of the service of the service of the continue of a common the mention of the middle of September. The constitution of the middle of September. The constitution of the middle of September. The constitution of the first part of the acceptance of the form part of the acceptance of the form part of the acceptance of the property of the constitution of the sub-class Monocaking dee. These are but six genera and ten species, the institute of tropical Asia. They are handsome trees, the strength sea, is Aguillaria, certain species of which private the fragment capte wood, or alone wood, supposed to be the common or agallochum of the ancients, the shallm or absolute of the Cld Testament, and the along bloom of the season of the New. This wood was formerly held in high registe as a medicinal agent in Europe; but its use is now chaplate.

Activities, A. d-gaille-yi-il (Lat., a gutter), in Bot., at gua, of plants belonging to the nat. ord. Mannenders.

the ancients, because the leaves are so shaped that they collect the rain which falls upon them, and retain it for some tune. The species are commonly called columbines, and several of them are cultivated in flower-horders, being handsome personnels. The petals are curiously formed, having each a long curved horn or spur at the base. Lanneus affirms that children have been possoned through sating portions of the

common columbine (A valgaris)
Ana, ass'd (Int., sitar), in Astron, a constellation in
the southern hemisphere, not visible in our latitude
it is subassed near the constellations of Pavo and the

Southern Triangle.

ar-a beak' (Tr., after the manner of the Arabiens), is a term synonymous with Man-rosque, and is applied to any isnorful style of decreation communing soroll-work interlaced with flowers,



HET MORE) RUPERELEA

fruit, leaves, and ten drils, and occasionally figures of men and ammala This style of ornamentation is supposed to have origin ted in the hieroglyphic emblems and figures used by the Egyptisms to decorate their pubhe buildings, dwellings, and uteneris. It was borrowed from them by the Arabians, who, under the name of Saracens and Moors, overran Asia Minor and the north of Africa and Spain. The Moors have left beautiful specimens of this decorative style in the Albambra in Spain, faithful copies of which may be seen

in the Alhambra court
the Crystal Palace, Sydenham. They were obliged
by the tenets of the Koran to confine themselves by the tenets of the Roran to confine themselves to the representation of the productions of the vegetable Ringdom. The Estrusous consumented their patters and administ in this manner, introducing aguest of man and animals; and the walts of the bashs of Ritts, discovered in the tune of Leo X., were adversed with aspectic work, from which it is said that Raphell derived, his idea of describing the famous gallery of the yetters in a such a manner. The Romanscopes while of the Yetters in a such a manner. The Romanscopes while of Luis XV. of France, farmistic size about the signs of Luis XV. of France, farmistic size corate examples of such species.

provided a structured from the description of the Assertion of the Assertion and the structured from the structure at the structure of the structured from the structure of the structured from the position horsenhoe archives the structure of the structure of the structured from the structure of the structure of the structured from the structure of the structured from the structure of the structured from the structured

Arable Land

Arabian Language
for religion, and gave them a constitution at once religions and military. In eighty years after his death, his followers had extended their power from Egypt we the Indies, and from Labous to Sumarrand. Contact with more civilised actions to Sumarrand. Contact and sciences began to Succeed these was featured at the splendid court of Airmansar, at Ragded (754-75); but it was Haroum at Raschid (766-608) that infused into his people on enduring force for them. He invited learned men from all parts to his kingdom, and munificently rewarded them. He existed translations to be made of the most estebrated works in Greek, Syrisc, and other languages, and circulated them by numerous copies. The calpid Al-Mannu (613-33) offered to the Greek supercor five tom of gold and a perpetual treaty of peace if he weakle such the philosopher Lee for a time to instruct him. Under his reign, excellent schools and large libraries, at Bagded, Alexandria, and other piaces, were established. But while the dynasty of the Abassides were fostering learning at Bagded, that of the Ommarades were similarly engued at Cordova, in Spain, which, particularly in the IOth qualury, was the chief seat of learning in Europe Students came from France and other parts of Europe to study, especially mathematics and medicine, at Cordova. Besides the docustional institutions at Cordova, the Arabs had established fourteen academies and numerous elementary and middle schools throughout the country. At a time when learning found and numerous elementary and middle schools throughout the country. At a time when learning found and numerous elementary and middle schools throughout the country. At a time when learning found scarcely any support or encouragement anywhere else, the Araba were collecting and diffusing it to all parts of the world; indeed, the progress of the Araba in learning is scarcely less remarkable than their success in conquest. In geography, history, mathematics, medicine, and physics, they have rendered important services, and many of their words are still to be found in the physical and mathematical sciences; as, algebra, sicohol, almenae, animuth, zenith, nadir, &c. Geography is not a little indebted to the labours of the Araba; they considerably extended the boundaries of the then known world by their expeditions of discovery; while the geographical treatiess of Abulfeda, Edrisi, and others, are still interesting and valuable. After the 5th centary, history came to be a favourite subject of study with them. Among their works of this class are the inversal histories of Masudi Tabari, Eutychins, the Christians Abulfara; and Elmakin, and Abulfeda, Fursiri, Soyuti, &c. Upon the history of the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain there are numerous works in the Araba in Spain the Araba in Spain the Ommanded Araba in the Araba in the Araba in the Araba in dynasty, which, with the introduction of the works of Aristotle, led to the formation of various sects of believers. The most celebrated exegeses of the Koran are by Samathshari and Baidhawi. Their philosophy believers. The most celebrated exegeses of the Koran are by Samakhahari and Baidhawi. Their philosophers was related to the Koran in the same way that the scholasticism of the Middle Ages was to the Scriptures. It was of Greek origin, and was drawn chiefly from the works of Aristotle. Among their most distinguished philosophers were Avicenna and Averroes, both of whom have written commentaries upon Aristotle. Many of the Aristotle highlosophers were also physicians, and they made considerable advances in chemistry, botany, and the knowledge of diseases. Anatomy, however, made no progress with them, as dissections, and the knowledge of diseases. Anatomy, however, made no progress with them, as dissections are groundliked by the Koran. Schools of philosopher arises and Averroes have both written able works upon medicine. On natural history wrote Daniri, Ibn-Baitar, and Kaswini. In mathematics the Arabe made great advances. In arithmetic they introduced the numerals now in use and decimals; and in trigonometry they adopted sines intecad of chords. They simplified the trigonometry they adopted sines intecad of chords. They simplified the trigonometry they adopted sines intecad of chords. They simplified the trigonometry and the first of the discount of the Greeks, and extended the application of algebra. Astronomy was aggerly studied, so which had not a country and famous schools and observatories, at Bugdad, they had famous schools and observatories, at Bugdad, wood land, common, and water, —as it

Arable Land
and Cordors. But with their progress in the sciences
the arabe did not asglest to unitvate poetry. Their
were gradually dilied itself to the nevaling uniture,
and in their most advanced period of ordination it
took a lighly writing from Exempt the dramatic,
there is no kind of poetry which they have left unattempted; and they footbless exerted a powerful influence upon mouters European poetry. Bomesces and lagendary tales also abounded, the most
femous of which are the physics Night's Entertainments (see next article), the exploits of antar, the
exploits of the Champions, and the exploits of the Arabe in
the civilized world in the Middle Ages with their present
state. As their military glory departed, so seems also
to have passed away their intellectual enthers. Bow
they are sunk in stupid indolence, and have no literature worthy of notice,—Ref. Brookhaus Concernations—
Lexiton.

ABABIAN NIGHTS' ENTERTAINMENTS, & Woll-known and very popular collection of eastern tales, first made known to Europe by Antony Galland, a French orientalist, under the title of "Les Mille et Une Nuits" (The Thousand and One Nights), 12 vols., Paris, 1704. The work speedily became popular, and was translated into all the European tongues. Improved and more complets editions have since appeared. The best English translation is that by Edward William Lane, which was published in 1839. These tales had long existed in the East before they became known to Europeans: they are supposed to be of Persian origin. Persian tales began to be translated into-Arabic about the 8th century, and probably, soon after this time, many of the tales may have been collected, this time, many of the takes may have oeen concered, though they were doubtless subsequently added to and improved. The great popularity of the work in Europe is to be accounted for from the great simplicity and rigour of its style, and the powerfully-drawn sensuous pictures with which it abounds,—its gilded palaces, pictures with which it abounds,—its gilded palaces, charming women, lovely gardens, and exquisite repasts; while the fearless courage of the Arab knight, his love of adventure, his dexterity and skill, his love and revenge, the craft of the women, the hypocrisy of the priests, and the vensity of the pidges, are all powerfully delineated. The story that forms the union of the tales is, that the Sultan Schahriag, exaperated by the faithlessness of his bride, made a law that every one of his future wives should he put to death the morning after marriage. At leagth, Sheherazade, the daughter of the grand vizier, by the charm of her stories induced the sultan to defer her execution from day to day, till a thousand and one nights had passed day to day, till a thousand and one nights had passed away. By this time, Sheherazade was the mother of three children, whom she led before the throne of her husband, and so induced him to spare her life.

Arabio, Gum. (See Guns.)

Arabio, divide to see which sprang up in Arabia about the year 207, who held that the soul died with about the year 207, who held that the soul died with the body, and also rose again with it. Origen is said to have refuted their error, and prevailed upon them to abandon it. It originated in an opinion teen held by many in the early oburch; that the soul of man was material. There were some revivals of this doctrine

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furnishes, with due care in its management, abundant furnishes, with due care in its management, abundant cereal crops, roots, and vegetables for the sustemance of man and animals. An account of the various series of soil, with their respective natures and properties, together with information as to the best method of preparing and improving the land, and the rotation of crops most advantageous to the farmer, will be treated elsewhere (see Borts, Cultivation of Soil, Rotation of Choos, Marues, Thilads, &c.); notices of the most important agricultural implements will also be found under their respective headings. (See Plough, Harrow Scapture, &c.) The principal component heround under their respectivenessings. (See FLOUGH, HABROW, SCRISTIER, &c.) The principal component parts of all soils are earths, chiefly clay, sand, and lime, mingled in various proportions; the oxides of metals, especially the protoxide and perfixide of iron, the former giving a black and the latter a red colour to the land; saling substances as potach sade &c. the primer gyning a black and the latter a red colour to the land; saline substances, as potash, soda, &c.; decayed animal and vegetable matter, and water.

ANACEE, d-rai'se-e, in Bot., the Arads or Arum family, a nat. ord. of monocotyledonous plants, in the

sub-class Petaloides,-herbs or shrubs with acrid juices and subterranean tubers, corms, or rhizomes. Their leaves are sheathing, usually net-veined and simple, but in rare instances compound. Their flowers are monoccious (male and female organs in separate flowers), and they are arranged on a spadix within a spathe. The order embraces 30 genera and 170 species. spathe. The order embraces 30 genera and 170 species. The Arada abound in tropical countries, and some few occur in cold and temperate regions. They are all more or less acrid, and often highly poisonous. The type of the order is the genus Arum (which see).

ARACHIS, ar-i-kis, in Bot., a gen. of plants belonging to the nat. ord. Leguminous, sub-ord. Papilionaece.

The species A. hypogæa, a native of the tropical portion of America, is remarkable for ripening its legumes under the surface of the ground, which characteristic is indicated by the names underground kidney-bean and ground-nut, commonly given to it. After flowering, the flower-stalks elongate and bend towards the earth, into which the pode penetrate. Each pod contains two, three, or four seeds, which, when ripe, are about the size of hazel-nuts. These seeds are used as food in various parts of the world; for the plant is now cutting. vated in Africa, Asia, and certain portions of Europe, as well as in its native regions. On being subjected to pressure, these seeds yield a fixed oil, which is extensively employed for cooking in India, where it is called katching oil. Being a very liquid oil, it has been used in this country for watches, and other delicate machi-

nery, as well as for harning, and other quicete machinery, as well as for harning, and other purposes.

ARACHNOID, a-rik-noid (Gr. arachnoides, from arachne, a spider, and eidos, form or ligeness), literally signifies colved-like. In Anat., the arachnoid membrane is the name of one of the three membranes which envelop the brain and spinsl cord. It is situate between the dura and the pia mater, and is a thin glisten-ing membrane. The tissue of the virtreous humour of eye has also this name.

ARROSTURE air-re-o-stile (Gr. araios, wide, and studes, a column), a term in Arch., used by Virtruvius to indicate one of his five species of Grecian and Roman temples. It refers to the distance at which the columns of a portion or colonnade should be placed apart, which should be from four to five times the diameter of the columns. Thus, if the columns be a foot in diameter, the distance between them should be from four to five feet. This proportion of intercolumniation is assigned more particularly to the Tuscan order of architecture.

more particularly to the Tuscan order of architecture. Arrostrythe, airre-o-sis'-tile (Gr. arcios, wide, sun, together, and stutos, a column), applied in Arch. to the proportioning of the space between columns arranged in pairs, with a wide interval between each pair. The columns at the western entrance to St. Paul's Cathedral are arranged in this manuer.

ARALIA, i-rai-had, in Bot., a gen. of plants belonging to the nat. ord. Archiaces. It contains a considerable number of species wires.

longing to the nat. ord. Arabicova. It contains a considerable number of species,—trees, shrubs, and inches, some of which yield useful products. A. nadilecture, to decide the controversy; and where herbs, some of which yield useful products. A. nadilecture, to decide the controversy; and where herbs, some of North America, where its roots controversy in the treatment of the must cafe to the architecture, to decide the controversy; and where here the norm of the appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or more than one is appointed, it is usual to appoint, or or whiteutors, to decide the controversy; and where here is not appointed, it is usual to appoint, or or whiteutors, to decide the controversy; and where here is appointed, it is usual to appoint, or or whiteutors, to decide the controversy; and where here is appointed, it is usual to appoint, or or whiteutors, to decide the controversy; and where here is appointed, it is usual to appoint, or or whiteutors, to appoint or arbitrators to appoint, or or whiteutors, to appoint, or arbitrators to appoint, or where its appoint or arbitrators to appoint, or where its appoint, or arbitrators to appoint, o

A. paperifera the Chinese prepare their so-called rice-paper. Several species of Aralia yield aromatic gam-resins.

gam-resins.

Arkitaus, arail-iai-es-e, in Bet., Ivy-worts, a nat. ord. of disotyledonous plants, in the sub-class Calgorifora,—trees, shrubs, or herbs closely allied to the unbelliferous plants, but not possessing, in the slightest degree, the poisonous properties so commonly found in those plants. There are 21 geners and 160 species, which are universally distributed; being found in tropical, sub-tropical, temperate, and the coldest regions. The most interesting genera are described under their respective botanical names. (See Aralia, Hedra, Jun, 2007, Arangam, 2007, A

HEDERA, IVE, PANAX.)

ARAMARN, or ARAMAIC LANGUAGE, dr-a-me-ies, the language of the country of Aram, a name literally signifying 'high land,' as distinguished from Canaan, or 'low land,' and applied to that district of country which comprised Syris, Bebylonia, and Mesopotamis. The Aramaic belongs to the Semitic class of languages, and is divided into two principal dialects,—the Western Aramaic or Syriso, and the Bastern Aramaic or Babylonian. There are also, as minor dialects the Samavitan Aramac or syrac, and the Lesseen Aramac or Lacy-lonian. There are also, as minor dialects, the Samaritan and Palmyrene. The Aramaean language is peculiarly interesting, as having been generally apoken by the inhabitants of Palectine, from the Babyloman captivity. to the final dispersion of the Jews. As a spoken language, it now exists only in some remote valleys of the mountains of Kurdistan: The Aramaci is generally the harshest, poorest, and least cultivated of the Semitic languages.

Semitic languages.

ARAUCARIA, ā-raw-kair'ā-ā, in Bot., a gen. of plants belonging to the nat. ord. Pinacea, or Conifera, the Pines, consisting of gigantic trees, natives of the southern hemisphere, and distinguished by having the male and female flowers on separate plants. The species are all evergreen, and their leaves are considerably broader than those of the ordinary pines and firs. A. receisa, commonly called the Norfolk-Island pine, is a post majestic tree, crowing to a height of firs. A exceta, commonly called the Norfolk-Island pine, is a most majestic tree, growing to a height of from 160 to 220 feet, and having sometimes a circumference of more than 30 feet. Its timber is white, close-grained, but remarkably heavy, and seldom sound for a great length: the bark abounds in turpentine. This tree occurs in Norfolk Island, New Caledonia, and some parts of Australia. A imbricate, the Chili pine, has been introduced into this country as an ornamental tree, and is now frequently planted as an ornamental tree, and is now frequently planted on lawns and in shrubberies. Its seeds are edible, and are extensively used for food by the natives of Chili and Patagonia. It is said that the fruit of one large tree will maintain eighteen persons for a whole year.

will maintain eighteen persons for a whole year. This tree was first found growing on the mountains of the Araucanian Indians, in South America; whence the name of the genus. A. Bidwillis, found at Moreton Bay, has also edible seeds.

Araucanians, a-raw'-kd-rites, in Geol., a term applied to specimens of fossil wood, resembling in structure that of living Araucaria. These fossils are common in the chalk, wealden, colite, and liss of Great Britain. Britain.

ARBALEST, ar'-bā-lest (Lat. areubalista, a crossbow), a weapon of war, the precise date of whose first introduction is unknown; but, according to some, it was in use in the Roman armies as early as the time of Constantine. It is supposed to have been introduced into England by the Normans. It was disused in England, as a weapon of war, in the reign of Henry VIII. The bowmen were distinct from the arbalesters, or crossbowmen. The arrows used with Henry VIII. The bowmen were distinct from and arbalesters, or crossbowmen. The arrows used with the crossbow were short and thick, and were called quarrels, from the French carreaux.

ARBITRATION, ar-bi-trai'-shon (Lut. arbitrium litis), ABBITEATION, ar-bi-tresi-shon (Latt. arbitrum tatil), in Law, is where contesting parties submit the action, suit, or any or all matters in dispute, to the judgment of an indifferent person or persons, called an arbitrator arbitrators, to decide the controversy; and where more than one is appointed, it is usual to appoint, or leave the arbitrators to appoint, an umpire (imperator or sinpar), to whose sole judgment it is then referred. The decision, in any of these cases, is called an award, which is final if not set saide by a court fer information.

mercury into a clean glass bottle, containing a solution of nitrate of silver. If left undisturbed for a few days, beautiful arborescent forms of metallic silver rise from the surface of the mercury, continuing to increase as long as there is any nitrate of silver left in the liquid.

ARBORESCERT, ar-bo-res'-est (Lat. arbor, a tree), in Chem., a term applied to crystals that assume a tree) like form. A small quantity of milk added to a solution of any sait will after its crystallisation to the arborescent form. Very beautiful arborescent metallic crystals may be formed for the microscope by planing an atom of copper in a drop of mitrate of silver, placed

on a glass slide. (See CEYSTALLIZATION.)

ARRORICULTURE, ar'-bor-i-kul-ture (Lat. arbor, tree), ARRONICULTURE, or content character (hardwork tree), the art of cultivating trees. The term is usually restricted to the planting and management of timbertrees; the cultivation of fruit-trees being regarded as a branch of horticulture. The ancients obtained their timber from natural forests, and only practised arbori-culture in landscape-gardening, or in forming public walks near their cities. In America, tree-felling, instead of tree-planting, occupies the time of the im-provers of land; and it will be long before arboriculture will be practised on an extensive scale on a continent so thickly wooded. The cultivation of timber-trees is so thickly wooded. The cultivation of timber-trees is unnecessary whilst natural forests are abundant. In England, plantations for timber and fuel were first established in the 16th century; and from that period arboriculture has steadily advanced. In the 17th century, the publication of Evelyn's Sylva did much to promote the taste for the art; and the greatly-increased demand for oak for shipbuilding gave a new invalue to its restricte. No extensive plantations were impulse to its practice. No extensive plantations were made in Scotland until the beginning of the 18th century, or in Ireland until the close of that century. In France and Germany, and in other parts of Europe, economical arboriculture has not made much progress. and is still almost confined to the management of and is sain among comment to the infragement of natural forests. In this department, however, the continental peoples, particularly the Germans, have made great strides, and have developed to their fullest extent the resources of their vast timber districts. Plantations are usually formed in Britain with seed-lings,—young trees raised from seed in nurseries; but sometimes, also, by sowing the seed on the ground which is intended for the plantation. Some authorities pronounce the latter plan to be the better of the two, believing that finer trees are produced when the seedlings are permitted to remain undisturbed on the ground in which they passed through their first stages of development. The gaps formed by the removal of timber in the natural forests of France and Germany are invariably filled up by sowing the seed. Trees may be conveniently classified according to their uses. may be conveniently classified according to their uses. The following is the system usually adopted:—1. Resinous or comferous trees,—the pines and firs. These yield straight timber for masts and long planks. 2. Hard-wooded trees; as the oak, sah, eim, beech, chestaut, walnut, sycamore, birch, thorn, hickory, holly, and box. Most of these trees fyrnish handsome, strong, and durable timber, such as is suitable for shipbuilding, household furniture, earts, tools, and various mechanical purposes. Some of them—the oak and chestnut, for instance—afford crooked pieces of timber for knees or bende in the ribs of ships: oak and chestnut, for instance—afford crooked pieces of timber for knees or bends in the ribs of ships; others, such as the thern and hickory, give pieces of remarkable toughness. 3. Soft-wooded trees; as the poplar, lime, horse-chestnut, alder, and willow, which yield wood suitable for turnery, basket-work, fuel, and a variety of useful purposes. In this class we may include the trees which are grown for flexible suckers and contract four beauty below to the state of the suckers. und apray to form hoops, baskets, besoms, and poles.

Hef. Brown's Forestor; Chambers's Information—
Arbosseulture; Traité das Arbosseulture; Mirbel et Poiret

ARBOR VITE, or'-bor vil-te (Lat., tree of life.) (See

TRUJA.)
ARRUSCULES, ar-bus'-ku-bus, in Bot., a term employed

ARBUTUS, ar-bu'-tus, in Bot., a gen. of plants belong-

sembling in shape and colour that of the strawberry. The corolls is urn-shaped. The most remarkable species is A. weede, which is a native of the south of Europe and the Levant, but new found also in Asia and America. It is cultivated as an ornamental evergreen-tree in Britsin, where it frequently attains the height of nearly swenty feet. It is commonly called the strawberry-tree. The most interesting specimens in the British isles are at the Lakes of Killarney, where they formflovely groves. A. Androckes, the Oriental arbutus, is even more elegant than the Killarney, where they formflovely groves. A. Lauruchus, the Oriental erbutus, is even more elegant than the common species; but, at the same time, it is much more delicate, and will not thrive in our variable climate. A. Jurens is a small shrub growing in Chili, and yielding a fruit having strong narcotic properties. ARC, art (Lat. arcus, a bow), in Geom. signifies any part of a curve line. The straight line which joins the arthur properties and the carbonities of the arc. is called its chord. The

the extremities of the arc, is called its chord. The practical operation for finding the length of an arc is as follows:-Divide the arc into a number of smaller as follows:—Divide the arc into a number of smaller ners, making the number large in proportion to the degree of accuracy required, then add together the chords of the smaller arcs. The sum of the chords will differ but little from the arc, even when the subdivisions are not numerous. For example,—the arc of the quadrant of a circle whose diameter is 10,000,000. of inches is 7,853,982 inches within half an inch. Divide this quadrant into ten equal parts, and the sum of the chords is 7,845,910 inches; divide the quadrant into fifty parts, and the same sum is 7,853,659 inches, which is not wrong by more than one part out of 24,316. For is not wrong by more than one part out of 23,316. For only twenty subdivisions the sum of the chords is 7,861,963 inches, wrong only by one part out of 3,890; therefore, for every practical purpose, an arc of a circle—and the same may be said of every other curve—is the polygon made by the chords of a moderate number of subdivisions of the arc.

ARCADE, ar-kaid' (Fr.), in Arch., a term applied to a series of arches of sur form supported on pillars either inclosing a space before a wall or any building which is covered in and paved, or, when used as an architectural feature, for ornamenting the towers and walls of churches entirely closed up with masonry. The cloisters of the old monasteries and religious houses were, strictly speaking, areades; and the covered walk round Covent-Garden Market is an areade, wrongly called a piazza. The term is also applied to a covered passage, with shops on either side, as the Lowther and Burlington Arcades in London. Poautiful specimens of the ornamental arcade may be found in many of our eathern drals and churches, as well as in many ruins; among which may be mentioned the striking and magnificent remains of Glassoubury Abbey, Somersetshire.

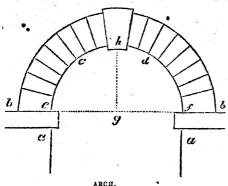
ARCANUM, ar-kei'-num (Lat., a secret), a term frequently employed by the old alchemists and philosophical writers, and usually used to designate any substance the mode of preparing which was kept secret. Thus, the ancient chemical philosophers called the red oxide of mercury, which was produced by the action of nitric acid, arcanum corollanum; sulphate of potash was termed, by the same writers, arcanum

diplicatum, &c.

Ance, arch (Lat. areas, a bow, a curved line), a structure, generally of stone or brick, in a curved form, over an open space, the pieces of which are arranged in a mauner calculated to bind them closely together by the pressure of one against another, rendering them capable of supporting a great weight of missoury above them. The ends of an arch are supmasonry above them. The ends of an arch are supported on columns or sides of masonry, called abutments or piers (a, a), rising perpendicularly from the ground; the arch is said to spring from its piers, and the first stones resting on the piers on either side (b, b) are sometimes called the springing-stones. The upper part of the arch is called the crown (a, d), and the stone in the centre (a), in the form of a wedge, which locks or binds the arch together, is termed the keystons. The sides of the arch (ec, d'), between its crown and piers, are called its kausches, or figals. The stones which compose the arch, all wedge-shaped, smaller at the under end than at the upper, are called vosaciva, while the under ends of the stones are called the index, or soft, and the upper ends the extrados, or All of the ust. ord. Ericaces, consisting of small trees trades, or selfit, and the upper ends the estrades, or and shrubs, most of them natives of America. The back. The line joining the extremities of the arch fruit is fleshy and many-seeded; in some species re- (cf) is called its span, and one drawn perpendicular 110

# Arch, Triumphal

to the span, from its central point to the centre of the bottom of the keystone (gh), its rise. These lines are also called the chord and versed sine of the arch. The also called the chord and versed sine of the arch. The Egyptians and Assyrians are said to be the first nations who used the arch in their buildings; arches, both of stone and brick, having been found by Belzoni, Wil-kinson, and Layard, at Thebes, Gizsh, Nimroud, and Khorasbad. The form of the arch is supposed to have been known to the Greeks, although there is no evi-dence, in the remains of their temples, to show the truth of the supposition. The Romans were fully acquainted with its constructive value, and were pro-



bably the means of introducing it, in its most simple and primary form—that of a semircircle—into Euro-pean architecture. The Britons and their priests, the pean architecture. The Britons and their priests, the Druids, were entirely ignorant of its use; the Saxons, however, approached the form of the arch by placing two stones in a slanting position against each other, like the sides of an equilateral triangle, supporting them on piers. The only forms used, until the adop-tion of the pointed arch in Mediaval architecture, in the 12th century, were the semicircle, segment of a circle, and ellipse? The horse-shoe form, peculiar to Arabian architecture, was probably derived from the segment of a circle greater than a semicircle. pointed arch was used by the Arabs as early as the 9th century, and is supposed to have been introduced into Europe at the close of the first crusade, and adopted, in various forms, as a pronfinent feature in Gothic architecture. The mechanical principles of the construction of arches will be treated elsewhere. (See BRIDGE and EQUILIBRIUM OF ARCHES.)

ARCH, TRUMPHAL, was a structure raised by the Romans to celebrate a victory, some grand historical event, or to add a greater lustre to the commemoration of the military deeds of a victorious general. These monuments had their origin in the custom of adorning with the spoils of war the gate by which a successful military leader entered Rome on his return from the battle-field. In time, these temporary monuments gave place to others of an enduring nature, such as stone or bronze. The arcus triumphalis, as this kind of structure was termed by the Romans, was generally erected in some main thoroughfare. The design was commonly either one large arch, or one large central arch, with one or two smaller ones at each side. In every case the fronts and sides of the structure were ornameuted with trophies, the entablature being surmounted with some piece of sculptural allegory, be-neath which was an inscription narrating the deeds of the hero in whose honour the arch was erected. Many of these celebrated structures are still in existence, the most remarkable being,—the arch of Augustus, at the most remarkable being,—the arch of Augustus, at Rimmis; the arch of Trujan, at Beneventum, and another at Ancona; at Rome, those of Constantine, Septimius Severus, Drusus, Callienus, and Titus; the most heautifully-proportioned, and at the same time which is in the man, Mathat of Constantine. Ma

# Archmology

departed Roman greatness are in existence in various parts of France, Greece, Spain, and Egypt. In modern days France has the greater number of these strinctures. Paris possesses the triumphal arches of the Porte St. Donis and St. Martin, built respectively in 1673 and 1874, to celebrate the victories of Louis XIV. The fine Arc du Carrousel, forming the western en-trance of the Tuilories, creeted to the honour of the French armies, was commenced in 1906, and finished in 1809, its height being 47 feet, its breadth 55. Surmounting the structure is a grand equestrian group, formed of a chariot, to which four horses are yoked.

the steeds being guided by the allegorical statues of Peace and Victory. But the grandest and most colossal triumphal arch erected by the moderns is that standing at the end of the Avenue des Champs Elysées, at Paris. It was erected in commemoration of the victories of Napoleon I. and his armies, and, although commenced in 1806, was not completed till after the revolution of 1830. It has three arches, the height of the central one being 95 feet. In the interior are graven the names of the most celebrated French generals, with that of their leader. The English capital possesses only two structures of this kind,—the arch at Hyde Park, upon which the equestrian statue of the duke of Wellington is placed, and the Cumberland Gate.

Weilington is placed, and the Cumberland Grate. Archaroctolaria, archeo-sid-dris (Gr. archaios, ancient, kidaris, turban), in Geol., a gen. of turban-shaped sea-urchins, fould in a fossil state, in carboniferous and Permian strata. (See Cidaris.) Archeoniscus, archeo-sid-lus (Gr. archaios, ancient; Lat. oniscus, woodlouse), in Geol., a gen. of fossil crustaceums, occurring in the Purbeck strata, and bearing considerable resemblance to the common woodlouse.

Alcheology, ar-ke-ol'-o-je (Gr. from archaice, old, ancient, and logos, a discourse), the name of the science which causes us to become acquainted with the antiquities of nations that have risen and fullen, and the remains of various kinds which throw a light upon the history of those that exist at the present time. Almost every kingdom now boasts its national archeological society; and in England there are many local associations, the members of which are sedulously engaged in the study and discovery, as well as the preservation, of the antiquities in their immediate neighbourhood, and in the counties in which they have been instituted. The term is capable of a very widely-extended signification, including everything that is connected with the rise and progress of any nation, its history, laws, religious observances, public and private buildings, manners, and customs of all classes of the people, the arts in use among them, and the extent of their acquirements in soicnee and scientific discoveries. The archeologist fallen, and the remains of various kinds which throw science and scientific discoveries. The archeologist seeks to study and preserve any materials which tend to elucidate the subjects already mentioned, and those materials naturally resolve themselves into three great classes, each capable of further subdivision. The first casses, each capable of further subdivision. The first class may be considered to consist of all records, written or printed, legal documents, old chronicles, disries of a public or private nature, state papers, letters, &c. The second may be termed oral, or traditional, in contradistinction to the first, which may be broadly called written archaelogy, and coasists of the ballads, legends, and folk-lore of a people, their sports, superstitions, and the rise and origin of local the hallads, legends, and lok-lore of a people, their sports, superstitions, and the rise and origin of local customs, proverbs, and expressions. The third, termed monumental archeology, consists of works of art, paintings, sculpture, coms, medals, glass, pottery, utensis of wood, metal, and other materials; tools of every description, armour, weapons, darriages, boats, roads, canals, walls, encampments, burisl places, carthen mounds for purposes of defence or sepulture, and over human remains and those of animals. The British Museum contains an abundant store of Egyptian, Assyrian, Greek, Roman, British, and other antiquities; and in many local collections, both of a public and private character, there are ample gatherings for the study of archaeology; but they are principally materials of a monumental nature. Additions to these collections are continually being mode by exploration. In the the oldest, being that of Titus, whose conquest of a monumental nature. Additions to these collections Judga it was built to celebrate. The sriumphal arch which is in the most perfect state of preservation is great works now constructing under London itself, that of Constantine. Many similar monuments of many feet below the present surface, tesselated pave-

ments, coins, tools, walls, and other remains, are constantly laid bare, which, in conjunction with such discoverice as that of the buried Roman city of Uriconium, or Wroxeter, lately found near the borders of Wales, are invaluable in illustrating the habits of a people that once held Great Britain as a tributary province, unrolling a page in which the antiquary can read many a fact traced in characters which cannot be mistaken. Societies such as the Roxburgh, Bannatyne, and Mattland clubs, have principally turned their attention to the preservation and reproduction of old printed records, and the publication of old writings of all sorts; while Sir Henry Ellis may be considered as one of the most active promoters of the preservation of traditional archaeology, or folk-lore, as his edition of Braud's" Popular Antiquities," published some twenty years since, will fully show. The government of this country, which formerly looked with suspicion on the enrolment of a society of archaeologists, now offers every facility and inducement to encourage the study of this science. The Society of Antiquaries, the parent society of all the associations now in existence in England, was founded in 1572, and broken up about thirty years after, by order of James I. It was mistaken Societies such as the Roxburgh, Bannatyne, ence in England, was founded in 1872, and broken up about thirty years after, by order of James I. It was revived in 1707, and the members received a charter of incorporation in 1751. In 1780 the Scottish Society of Antiquaries was founded, and, sir years after, the Royal Irish Academy, instituted for a similar purpose. All these societies have given their attention to the collection of archæological records of all sorts, and possess valuable museums. Among other societies of a similar nature on the continent, may be mentioned the Royal Society of the North, at Copenhagen. The museums of Paris and Naules nessess flue collections museums of Paris and Naples possess fine collections of Egyptian, Greek, and Roman antiquities, the officers of the latter especially collecting Roman remains from the excavations made on the sites of the cities of Pompeii and Herculaneum, buried by an eruption of Vesuvius in the year 79. Every country possesses, in a greater or less degree, relies of antiquity of the greatest interest to the archerologist. From the sculptured stones and obelisks of Egypt and Assyria, records have been unravelled by Rawlinson, Layard, and others, that throw great light on the early history of these countries, and offer convincing testimony to the indisjoutable truth of Holy Writ. In Mexico and Central America, evidences have been traced of the existence of a clever and ingenious people that had passed from the surface of the earth before the discovery of the Western hemisphere by Columbus. In the excavations made on the sites of the cities of Pomall countries, especially those under British rule, col-lections of antiquities are eagerly made; and in pro-portion to the encouragement and advance of archa-ology, history will become the record of a people's customs and household words, instead of a stern cata-logue of bloody wars and the ruthless deeds of kings and ambitious men who sought to make the people stepping-stones by which they might gain the objects of their desire.

of their desire.

ARCHAISM, ar'-kai-ism (Gr. archaios, ancient), is a term employed in Lit. and Rhet. to denote the use of an obsolete word or phrase, in order to give an air of antiquity to the passage in which it occurs.

ARCHAIGEL, ark'-ain-jet (Gr. arche, chief, and aggelos, an angel), a term employed to denote a high order of angelic beings. In Scripture the term is only applied to Michael, and is nowhere employed in the plural. Holy Writ seems to indicate that there are different degrees and orders aronn archie beings. different degrees and orders among angelic beings, but gives no specific information on the subject.

but gives no specific information on the subject.

ARCHARGLIG, ork-im-jet'-i-ki, in Bot., the herb Archangel, a gen. of plants belonging to the nat. ord. Umbellifere. The species are mostly herbaceous and perennial, natives of the cold and temperate regions of the northern hemisphere. A. officinalis, the garden angelica, is an indigenous biennial, growing in watery places, but somewhat rare in this country. It grows in moist situations, and flowers from June to September, the blossoms being greenish-white. Its root is large and flesby, resinous, and pungently aromatic. It is imported from Hamburg in the dried state for medicinal purposes, being stomachic and carminative. The fruit, improperly termed the seed, has similar porennial, natives of the cold and temperate regions of the northern hemisphere. A. officinalis, the garden angelics, is an indigenous biennial, growing in watery places, but somewhat rare in this country. It grows in moist situations, and flowers from June to September, the blossoms being greenish-white. It root is ber, the blossoms being greenish-white. It root is large and fleshy, resinous, and pungently aromatic. It is imported from Hamburg in the dried state for medicinal purposes, being stomachic and carminative. The fruit, improperly termed the seed, has similar properties. The tender stems and mid-ribs of the properties. The tender stems and mid-ribs of the originally merely the chief of the deacons, who were leaves are boiled in syrup, and, when dried, constitute

candied angelica, which, taken as a dessert, is a very agreeable stomachic. The plant is cultivated for the purpose of candying in the neighbourhood of Loudon. Large quantities of angelica are consumed by the rec-tifiers in the preparation of London gin and the liquor known as "bitters."

liquor known as "bitters."

ARGENISHOF, arch-hish-op (Gr. arche, chief, and episkopps, bishop), is 'the title given to a bishop who, besides exerciaing episcopal authority in his own diocese, has an admitted superiority, and a certain jurisdiction, over the bishops in his province, who are sometimes called his suffragans. He is also sometimes called primate or metropolitan. The title came into use in the 4th century. At first the term was considered as equivalent to patriarch, or bishop of an imperial diocese; as Rome. Constantinople, Angioch, Alexandria, Ephesus. After the 6th century the srch-bishop of Rome assumed the title of Pope. In England there are two archbishops, of whom the one has his seat at Canterbury, the other at York. The archbishop of Canterbury is styled Primate of all England, and is the chief medium of communication between and is the chief medium of communication between and is the chief medium of communication between the crown and the olergy, being consulted by the ministers on all questions touching the ecclesiastical part of the constitution. He has precedence of all temporal peers except those of the blood royal. The Lord-Chancellor takes precedence after the archbishop of Canterbury, and before the archbishop of York, who is styled Primuste and Metropolitan of England. His province consists of the six N. counties, with Cheshire, Nottinghamshire, and the Isle of Man, and he has six suffragans—the bishops of Durham, Carlisle, Chestor, Ripou, Manchester, and Sodor and Man. The rest of England constitutes the province of the archbishop of Canterbury. The precise amount of superintendence England constitutes the province of the archisano of Cauterbury. The precise amount of superintendence or control which may be exercised by an archisano over the bishops of his province does not seem to be very accurately defined; but if a bishop introduces irregularities into his diocess, or is guilty of immoral-ties, the archisanop may call him to account, and even deprive him of his office. In Ireland there are two Protestant and four Roman Catholic archbishops. Of the former, the archbishop of Armagh is styled Primate of all Ireland, and has five suffragan bishops; the archof all freiand, and has are surragan bishops; the archishop of Dublin is Primate of Ireland, and has also five suffragan bishops. The election of an archbishop does not differ from that of a bishop (see Bishop); but while a bishop is only installed in his offlice, an archbishop is enthroned. An archbishop is styled "Grace," and "Most Reverend Father in God," and "Grace," and "Most Reverend Father in God," and writes himself "by Divine Providence;" a bishop is styled "Lord," and "Right Reverend Father in God," and writes himself "by Divine Permission." During the vacancy of a see, the archishop is guardian of the spiritualities; and he also nominates to the benefices or dignities at the disposal of the bishops in his province, if not filled up within six months. Every bishop, whether created or translated, is bound to make over he dead the next presentation of such henging or directions. whether created or translated, is bound to make over by deed the next presentation of such benefice or dig-nity belonging to hissee, as the archbishop may choose. The archbishop of Canterbury claims the right of placing the crown upon the head of a king at his cor-nation; and the archbishop of York claims to perform the same office for the queen consort.—Ref. Knight's English Cyclopædia.

English Cyclopadia.

ARCHDRACON, arch-de'-kon (Gr. arche, chief, and diakonos, a servant or officer), is an ecclesiastical dignitary next to a bishop. Each diocese comprises one or more suchdescoury, over which one of the clergy is appointed to preside. He must be a priest of at least six years' standing; and his duty is to visit his archdeacouries from time to time; to see that the churches, and especially the chancel, are kept in repair, and that everything is done conformably to the canons; and to receive from the churches arms arms are transported in the chance of t

#### Archduke

affairs. His functions were confined to attending upon amairs. Its functions were commed to attending upon and assisting the bishop in the discharge of his spiritual duties, and the management of his diocese, without laving at first any jurisdiction. There are intra-seven archiesconries in England and Wales.—Ref. Knight's English Cyclopadia.

ARCHDURE, arch-duke', a duke-whose authority and power is greater than that of other dukes. In France, power is greater than that of other dakes. In France, in the reign of Dagobert, there was an archduke of Austrana; and, at a later period, the provinces of Brabant and Lorraine were termed archduchies. The dukes of Austria assumed the title of archduke in the

dukes of Austria assumed the title of arconduct in the year 1165; but the dignity was not confirmed till 1453. In the present day, none but the princes of the house of Austria affect the title.

Archægosatheus, ar'-ke-go-saw'-rus (Gr. archegos, beginning, sanros, lizard), in Geol., the name signifying 'primeval lizard,' given by Goldfuss to a reptile of the Carboniferous era, allied to the existing reptiles, the preference of levidoriser.

the tarbonnerous ers, and to the existing repriles, the proteins and lepidosiren.

ARCHER, (See Archers).

ARCHER-Fish, ar'-cher fish, a curious little fish inhabiting the Chinese seas. Lurking near the surface of the water, it awaits the approach of an insect, and then condens to curious within including suddenly squirts at it a drop of water, which infallibly brings it down. It is about seven inches long, and has a wide mouth, with the lower jaw considerably pro-longed. The Chinese keep these fishes in jars, and amuse themselves by watching the effect of suspending a fly above a jar with a thread.

ARCHERY, ar'-che-re, the art of shooting with a bow and arrow, so called from the Latin word areas, a bow. With respect to the origin of archery, we nothing more than that it must have been practised at a very early period; for we are told that Hagar, in order not to see her son die, set herself down a good way off, as it were a how-shot; and soon after it is said that Ishmael dwelt in the wilderness, and became said that Ishmael dwelt in the wilderness, and became an archer. The bow and arrow are frequently mentioned in Scripture, more particularly in the accounts of the wars of the Jewish people. Indeed, down to the introduction of gunpowder, the bow-and-arrow was an implement of warfare among all nations in all states of civilization. Great dependence was usually placed upon the archers in war; and frequently the success of a battle hag been attributed to their means, as at Cressy, Politiers, and Aguicourt. It is believed that the long-bow was common in England long before the Sayon invasion. The Sayons were expect archers that the long-bow was common in England long before the Saxon invasion. The Saxons were expert archers, both in battle and in field sports. The Normans brought with them the arbalest, or crossbow; but, from the reign of Edward II., the long-bow, the favourite national weapon, seems to have been fully established. Edward III. directed the sheriffs of shires to see that the people exercised themselves in their leisure time in archery, in place of following uscless or unlawful games or amusements. Chancer, in his prologue to the Canterbury Tales, gives the following carefully-drawn picture of an archer of his day :

"And he was clad in coat and hood of green;
A sheaf of peacock arrows, bright and keen,
Under his belt he bare full thriftily. Well could he dress his tackle yeomanly; His arrows drooped not with feathers low, And in his hand he bare a mighty bow. His head was like a nut, with visage brown : Of woodcraft all the ways to him were known:
An arm-brace wore he, that was rich and broad,
And by his side a buckler and a sword; While on the other side a dagger rare, Well sheathed, was hung; and on his breast he bare
A large St. Christopher of silver sheen.
A horn he had, the baldric was of green,—
A constant truly was he, as I guess." A forester truly, was he, as I guess.

A forester truly, was no, as I guess."

Under Edward IV. a precept was issued, commanding that every Englishman and Irishman in England should have a bow of his own height; and butts were ordered to be set up in every township for the inhabitants to shoot at; and, if any one neglected the use of his bow, he was subject to a fine. In the reign of Henry VIII. it was ordained, that every man under sixty, except spiritual men, justices, &c., should use shooting with the long-bow, and have a bow and arrows continu-

# Archery

ally in his house; that every father shall provide a bow and two arrows for his son when he shall be seven years old; and that every servant above seventeen and university years of age shall pay 6s. 3d. if he he without above and arrows for one month. Latimer, in one of his sermous before Edward VI., published in 1549, strongly the practice of archery, saying,—"In my old; and that every servant above seventeen and under sermous before Edward VI., published in 1549, strongly enforced the practice of archery, ssying,—"In mytime my poor father was as diligent to teach me to shoot as to learn me any other thing; and so, I think, other men did their children. He taught me how to draw, how to lay my body in my bow; and not to draw with strength of arms, as other nations do, but with strength of the body. It is a godly art, a wholesome kind of exercise, and much commended in physic." After the destruction of the Spanish Armads, fears being entertained lest the king of Spain should send an emissary to attempt the life of Queen Elizabeth, a number of obblemen of the court formed themselves into a bodynoblemen of the court formed themselves into a body-



ENGLISH ARCHERS.

guard, for the protection of her person, and, under the denomination of the "Companie of Liege Bowmen of the Queene," had many privileges conferred upon them. Upon the accession of James I. this company was disbanded, although those who composed it re-tained the privileges which had been conferred upon them by Elizabeth. Upon the breaking out of the civil war, Charles I. reorganized this body-guard, which attended him against the parliamentary forces, and afterwards emigrated with Charles II. At the Restoration this company was maintained, and, under the title of the "Royal Company of Archers," received a new charter; it afterwards merged in the Artillery Company of London. Recently, archery has come to be revived as an anusement, and societies have been formed for the practice of it in various parts of the country. The Toxophilite Society of London was first formed for the practice of it in various parts of the country. The Toxophilite Society of London was first established in 1781. One of the largest and most flourishing of these societies is the "Royal Company of Archers of Scotland." It is said to owe its origin to the commissioners appointed by James I. of Scotland to superintend and regulate the practice of archery throughout the country, when a number of the most expert archers were selected to form a body-guard for the king. They claimed the honour of action in this the king. They claimed the honour of acting in this the king. They claimed the honour of acting in this capacity on the occasion of the visits of George IV. to Edinburgh, and they now constitute part of the royal household in Scotland. The principal instruments of archery are the bow, string, arrow, gleve, and brace. Hows are of two kinds, called self-bows and back-bows. Self-bows are those that are made of only one piece of wood, the best being foreign yow. Back-bows are composed of two kinds of wood, being strengthened by a nices of ash or other tough wood, firmly glued to the a piece of ash or other tough wood, firmly glued to the

#### Arches. Court of

back. An arrow is furnished with three feathers, one of which, of a different colour from the others, is placed uppermost on the string, and is called the cookfeather. The piles or heads are made either blunt or charp; the advantage of the former kind being, that they are more easily extracted than the latter. The weight of the arrow should be proportioned to the strength of the bow. For bows of 5 feet, arrows of 24 inches are commonly used; and for those of 5 feet 9 inches, arrows of 28 or 29 inches. The nock of the arrow is asnally cased with horn, and should be made so as to exactly fit the string. The shooting-glove is used to protect the fingers from being injured by the string, and consists of three linger-stalls, back-slips, and a cross-strap buttoned round the wrist. The brace is a piece of stout polished leather, buckled round the bow arm, to protect it from the string, as well as to allow the string to glide sharply and quickly over it. Besides these, there are the quiver, a tin case for holding the arrows not immediately in use, and the belt, worn round the waist, from which are suspended the tassel for wiping the arrows, and the grease-box, containing a composition with which the fingers and brace are occasionally anointed, and which has also a pouch for holding arrows intended for present use. To be a good archer demands long and continuous practice. The muscles of the body must be brought into a certain degree of strength and firmness, the mind must be caim and collected, and the eye steadily fixed

must be caim and collected, and the eye steadily fixed upon the mark. The principal points to be attended to in practice are standing, necking, drawing, holding, and loosing on each of which much useful information will be found in the Toxophilus of Roger Ascham. The distance to which an arrow can be sent by a good archer is generally from 200 to 250 yards.

ARCHES, COURT OV, ar-ches (Lat. curia de arcabus), the chief, and most ancient consistory court, belonging to the archbishop of Canterbury, for debating of spiritual causes, whereof the judge (who sits as a deputy to the archbishop) is called the Dean of the Arches; because he anciently held his court in the church of St. Mary-le-Buc, in Cheapside (Sancta Maria de Arcubus), though all the principal courts are now holden at Doctors' Commons. Bow Church is so named from the steeple, which is raised by pillars built archwise, like so many bent

AMCHETYPE, ar'-ke-tipe (Gr. archetupos, from arche, chief, and tupos, form), properly signifies the pattern or model after which anything is made. In Phil, the term was used by Plato to denote the idea or pattern of the world which existed in the mind of Deity previous to its creation, and according to which it was made. Hence, all things were formed after original archetypes in the divine mind, which thus possessed within itself an archetypal world corresponding to this sensible world; while our minds, as partisking of the nature of the divine, also have archetypal forms

of sensible objects.

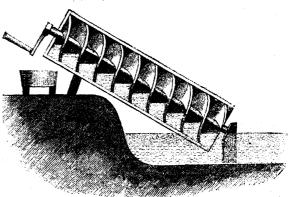
ARGHI, or ORCHIL, or 'kil or arch'-il.—The red, violet, and blue colouring matters known in commerce by the names of archil or orchil, cudbear and litmus, or turnsole, are obtained from the Rocella tinctoria, and other lichens growing on the rocks of the Canary and Cape de Verde Islands, the Cape of Good Hope, the Pyrenees, and other parts of the world. The colouring matter, which is termed by chemists crysthress, does not exist in the lichens ready formed; but they contain certain acids, which, under the influence of alkalies, are transformed into colouring matter. The lichens are first cleaned and made into a paste with stale urine, to which lime has been added. This mixture is exposed to the air for some weeks, fresh urine being added from time to time. The paste thus obtained is dried, and constitutes the archil of com-

## Archimedes, Principle of

merce. Cudbear is obtained similarly from the Lenanona tarturea. Litmus is prepared from Rovella timetoria, carbonate of potash and carbonate of simmonia being substituted for the urine. It is made up for the market into little cubes with chalk or plaster of Paris. These dyes are rarely used alone, from their want of permanence; but they are extremely valuable in imparting bloom and force to other dyes.

ARCHIMANDRIER, ark'd-mein'-drife (Gr. arche, chief, and mandra, a fold or monastery), in the Greek church is the title of the superior of a monastery, and is equivalent to abbot.

ARCHIMEDEAN SCREW, or SPIRAL PUNP, ar-ki-medde-da, a pachine invented by Archimedes, the celerated Syracusan philosopher, while studying in Egypt, in the third century n.c. Observing the difficulty of raising water from the Niet to places where the flood tide could not reach, he is said to have devised this screw as a means of overcoming the obstacle. It consists of a pipe twisted spirally round a cylinder, which, when at work, is supported in an inclined position. The lower end of the pipe is immersed in water, and when the cylinder is made to revolve on its own axis, the water is raised from bend to bend in the spiral pipe until it flows out at the top. The Archimedean screw is used in Holland for raising water and draining low grounds. The Dutch water screws are mostly large, and are moved by the wind one windmill furnishes the motive power to several screws.

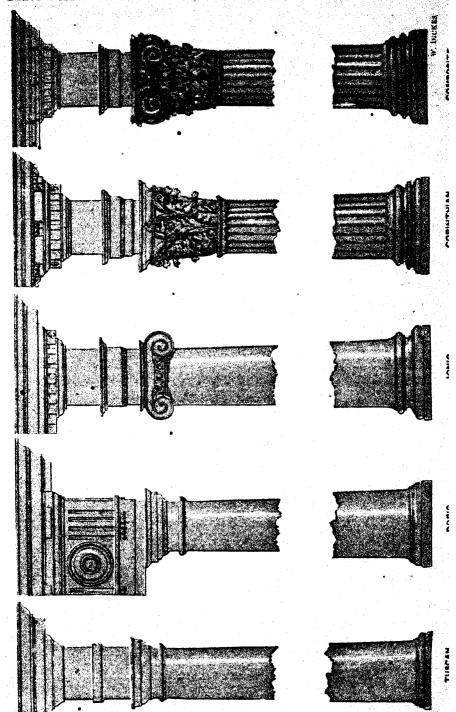


ARCHIMEDRAN SCREW. (SECTION.)

ARCHIMEDES, PRINCIPLE OF, ar-ki-me'-dees, a celebrated principle in the science of Hydrostatics, the discovery of which is attributed to the Syracusan philosopher whose name it bears. This important theorem may be thus expressed: when a solid is immersed in a fluid, it loses a portion of its weight, and this portion is equal to the weight of the fluid which it displaces, that is, to the weight of its own bulk of the fluid. An experimental proof of this highly-important principle is obtained in the following manner:-From one of is obtained in the lonowing manner:—From one of the arms of a balance is suspended a hollow cylinder, having a cylindrical mass of any substance capable of exactly fitting into it hanging from it by means of a thread. From the other arm of the balance hangs a scale-pan, into which weights are placed until the solid cylinder and the hollow one are exactly counterbalanced. Water is then poured into a vessel around the solid cylinder, until it is completely immersed; upon which the weights in the scale-pan will preponderate, the solid cylinder seeming to have lost a considerable portion of its weight. The balance will, however, be once more brought into equilibrio if water be poured into the upper hollow cylinder until it is quite full. Now, as this hollow cylinder is of such a size that the solid mass exactly fits its interior, it follows that the water with which the hollow cylinder. is filled is precisely equal in bulk to the solid cylinder. which proves that the apparent loss of weight suffered

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# Plate VIII.—ARCHITECTURE.





### Architect

by the latter is precisely equal in weight to a mass of water equal in bulk to itself. This very ingenious water equal in bulk to itself. This very ingenious method forms one mode—not the most exact, howtained. (See Specific gravity of solids is ascortained. (See Specific Gravities.) A wonderful story is told in connection with the discovery of this story is told in connection with the discovery of this celebrated principle. Hiero, kingof Syrasuse, intending to make an offering to the gods of a crown, commissioned a goldsmith to manufacture one of pure gold. After a time, the crown was brought home, of the full weight; nevertheless, it was suspected that a part of the gold had been stolen, and a like weight of silver substituted. Arobimedes was desired to devise a means of selecting the found and while anguard in selection

of detecting the fraud, and while engaged in solving the difficulty, he happened to go into the bath, where, observing that a certain quantity overflowed, equal to the bulk of his body, he instantly saw that what Hiero sought to know might be obtained. Carried away by his ardour and delight, he is stated to have hastened home without waiting to dress, crying out, "Eureka! eureka!" (I have found it! I have found it!)

Architect, ar's-teets (fr. architecture, or the art of building, who forms plans and designs for edifices, and under whom the work is conducted to completion. A thorough knowledge of mathematics is an indispensible will article and a second control of the second c sable qualification in an architect; he should also be expert in perspective-drawing. His emoluments are appear in perspective-trawing, it is emoluments are appearally 5 per cent, on the amount of money expended.

Perhaps the most remarkable instance of a departure from this catchingted principle are a few forms. from this established principle was made in the case of the late Sir Charles Barry, the architect of the Westminster Palace. Some time after the commencement of this structure, it was arranged that the architect's remuneration should consist of £25,000, a sum which, although subsequently increased, was immeasurably below that which he would have received had the ordi-

below that which he would have received had the ordi-nary rate of requital been followed.

ARCHITECTURE, ar-ki-tek'-ture (Lat. architectura, art of building; Gr. archas, chief, and tekton, a builder or workman), the science of building or construction, consisting of three principal divisions,—civil, naval, and military architecture. Civil architecture is that branch of the science which instructs us in the art of creeting buildings of a public and private character, bridges, and other works, in wood, iron, and masonry; the construction of buildings, such as churches, the atres, and houses of all kinds, belonging to architecture, properly so called; while that of bridges, docks, har-bours, tunnels, breakwaters, &c., is the especial pro-vince of the civil ongineer. Naval architecture, in which the English particularly excel, treats of the different methods of building ships and vessels of all kinds, with reference to speed, strength, and capacity for stowage (see SHIPUTILDING); while military archi-tecture, or fortification (see FORTHICATION), is the art of constructing works of defence, such as citadels, fortresses, and their outworks, and other constructions used for protection in warfare, by means of which we may most effectually guard against the attack of an enemy, that might be made by sea or land, on any place in which government stores are kept, naval and commercial harbours and ports, and towns situated on the frontier line of continental powers. There are five orders of architecture, known as the Tuscau, Doric, Ionic, Corinthian, and Composite, proceeding from forms of extreme simplicity to others of great benuty and elegance in design, replete with highly-elaborated ornamentation. There are also numerous styles of this important art, notices of which will be found under their respective headings. (See Arabian, Assyriam, Byzantine, Celtic, Egyptian, Gothic, Greek, Hinnoo, Norman, Renaissance, Roman Architecture, &c.) The science generally may be broadly considered under three grand divisions,—ancient, mediaval, and modern; in the first of which it may be traced from its origin to its improvement forms of extreme simplicity to others of great beauty it may be traced from its origin to its improvement under the Greeks and Romans; in the second, its state and style under the Goths, Saxous, and Normans; and in the third, the present practice of the art, and its adaptation to the requirements of our own times. Architecture in its early stages seems to have advanced hand-in-hand with civilization. The necessities of man would at first induce him to seek for some means of shelter and protection from the heat of the sun, the

## Architecture

cold wind, and dreuching rain, in the construction of the simple cone-shaped but of poles, interfaced with osiers and twigs, covered with bark, and plastered with mud, or the adaptation of the rude cave, which chance had thrown in his way, as a temporary retreat from the inclemency of the weather. After a while, from the inclemency of the weather. After a white, when the first germs of society and social life appeared, and small communities were formed by families living and small communities were formed by families living in close proximity to each other; for mutual protection,—when the earliest principles of trade and barter began to be understood, attention was naturally directed to the construction of edifices presenting, at first, greater durability and convenience, and afterwards some rude attempts at decoration; that the dwelling of the chief of the associated families, or the dwelling of the chief of the associated families, or the dwelling of the chief of the associated families. building in which any ccremonies of a religious or public nature were performed, might be distinguished from the huts of the community at large, even as we may see in our own times, in the krauls of the Hottentots and South-African tribes, the wigwams of the North-American Indians, and the huts of the Maoris, or New Zealanders. The straight upright trunks of trees would then have been used as columns to support the poles which formed the framework of the covered with bark or rushes, secured and bound to-gether with pliant twigs and ropes formed of the twisted stalks of climbing plants that were sufficiently tough for the purpose. From the rough saplings laid on the tops of the trunks of trees so used, would be derived the architrare; and, as human progress furnished tools to shape and fashion blocks of rugged stone into forms of symmetry and elegance, the trunks themselves of the trees would suggest the shapely column, with the torus, or swell above the plinth, a flat stone on which the base of the wooden pillar rested, as a foundation more solid and stable than the earth The lower ends of the branches of a tree, cut off a little above the spot where they began to grow outwards from the trunk, would give the first notion outwards from the trunk, would give the first notion of the capital, presenting, from his spreading form, a wider basis, to receive the superincumbent beams of the roof; and the abacus would have originated in a flat stone, placed on the top of the wooden shaft, to prevent any settlement of rain in the hollow at the top. Materials twisted toggsher, to bind and secure the columns, would furnish ideas for the astragal and fillet, while the frieng and compine and their regions fillet; while the frieze and cornice, and their various ornaments, would be derived from boards fastened to the ends of the transverse beams that formed the ceiling, decorated with such simple devices as short billets of wood might furnish, that were attached to the woodwork in patterns suitable to the form of the material at hand.

Ancient Architecture .- The most simple structures in stone that can be mentioned are the circular and oblong inclosures made by the Druids and priests of the Oeltic nations, of rough, unhewn, upright blocks, surmounted by similar pieces laid transversely from top to top of these rude columns. They bear some resem-blance to the undressed altars, and stones of remembrance and witness, that the worshippers of God, in the patriarchal times, and even after the entrance of the Israelites into the promised land, were accustomed to creet in his honour; and these may be taken as the general types of the commencement of the science among all nations, and in all ages. The next step would be the construction of rough irregular walls, exemplification of which may be found in the cyclopean walls of Tiryns, built by the Pelasgi, and the defensive works round Mycenae. These Grecian structures, and the tomb of Atreus, near Mycense, adorned with rude figures supposed to represent liens, with similar remains in Italy, such as the Etruscan walls at Fiesole, represent the second stage in the constructive art of huiding, which would rapidly advance from this point. The Egyptians, Assyrians, and Persians, the rulers of the known world wall as the second stage and discussed the amountains and the second stages are second stages are second stages and the second stages are second stages are second stages are second stages and second stages are second stages are second stages and second stages are second stages and second stages are second in early ages, soon discovered the convenience and comfort of dwellings made of brick and stone, and in a short time carried their architectural works to an a snort time carried their architectural works to the interedible extent. At this period, ornament began to be combined with mere building in stone; and from this combination architecture may be considered to be produced; for ornament is essential to architecture, and without the appliance of decorative features no building can be said to possess any architectural design. The

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pyramids, supposed to have been built in honour of the sun; the ruins of Anders in Upper Egypt; the re-mains of Persepolis, so vast and grand 1,300 years after its destruction by Alexander the Great, that the Arubs of that date imagined the city to have been built by the agency of evil spirits; the discoveries at Nimroud and Khorashad; the sculptured relics of past ages that still exist throughout the land of Egypt, all these bear silent testimony to the constructive powers, and won-derful mechanical contrivances, of men whose build-ings, for extent, and grandeur, and sublimity of concepthey are unequal to them for harmony of proportion and examples any structures of our own times, though they are unequal to them for harmony of proportion and exammetrical beauty. That architecture was brought to great perfection by the Jows, the temple and palaces built by Solomon furnish abundant proof, and the gates and fortifications of the sacred city; and after this period Assyrian architecture reached its culminating point under Nebuchaduezzar, the most magnifect thuildings of that empire having heav resied by nating point under Nebuchaduezzar, the most magni-ficent buildings of that empire having been raised by him after models and ideas probably suggested by the grand and gorgeous works of the inspired architect at Jerusalem. From Egypt and Assyria, the Grecks, in all probability, derived their knowledge of architecture; the rows of columns in a Grecian temple, surmounted by the flat and massive architrave, bearing a strong resemblance to the heavy square roofing of the Egyp-tian palaces and banqueting halls, raised on sculptured supports of massive size and cumbrous appearance. But the gloomy magnifieence of the buildings of Egypt was not copied by the Greeks, who substituted forms of beauty and symmetry, and were influenced by a due regard for proper proportion of length, breadth, and height, in making designs for their temples and public heigh, in making designs for their temples and public buildings. They also changed the stiff, almost grotesque imitations of the human figure, as it appears in specimens of Egyptian sculpture, into copies of men and animals, faulities in outline, for the adornment of frieze and portico; and for the colossal images that were hewn by the Egyptians out of the living rock with infinite labour and toil, they produced exquisitely chiselled statues, which are still renowned as models of perfect elegance, combining health with mainsty of perfect elegance, combining beauty with majesty of expression, and strength with symmetry of form. Grecian architecture may be considered to have reached its height about 440 B.C., when the sculptor Phidias flourished, and Pericles, one of the first of Grecian statesmen, lived. In an ancient province of Italy, then called Etruria, now named Tuscany, there lived a people who had attained, some 350 years prior to this period, a high degree of civilization, proofs of which are given in the figures, vases, cups, sarcophagi, and other articles made by them, which still exist. From this nation the Romans doubtless derived the greater part of their customs and veremonies; they were well skilled in building, and Tuscan architects designed and built, and Tusean artists adorned, the temples of the gods and great public works of ancient Rome under her seven kings. The temple of Jupiter Capitolinus, and the arched sewer (the Cloaca Maxima), as well as the aqueducts that were first built to supply Rome with water, show that they well understood the science and practice of building, and made practical application of the utility of the arch, which the Egyptians and Greeks neglected, although evidence exists to show that the former nation at least were well acquainted with, though they rarely used, the principles of its construction. When Greece was conquered by the Romans, the knowledge that they had acquired of the science the knowledge that they had acquired of the science of building was extended by their intercommunication with the Greeks, who had improved the art to the utmost extent of their powers by blending utility with elegance; and from the combined skill of the Greeks and Romans we derive the five established orders of architecture,—the Tuscan, Doric, Ionic, Corinthian, and Composite—distinguished from each other by difference of proportions, as well as by the form of the column, hear, christal, and entablature. base, capital, and entablature.

hase, capital, and entablature.

Theorem of order.—This order generally has the first place assigned to it in treatises on architecture, on account of the extreme simplicity. Its general character seems to be that it has few parts, is devoid of ornament, and appears able, from its massive construction, to support the heaviest burden. It derives its name from the province Tuscany, as the Tuscans were fond

of introducing it into every edifice of great size. It is considered by some to be debased Dorio, but there is great uncertainty respecting its origin. Vitruvius is great uncertainty respecting its origin. Vitravius does not give a single example of structures of this order in his work, although he mentions its proportions. order in his work, although he mentions its proportions. The following are the comparative proportions of the order, according to Sir William Chambers, taking the diameter of the base of the column as the unit of measurement:—Height of column 7, including base §, capital §, and shaft, with upper cincture and astragal, 6; entablature 13, which is divided into 10 parts,—3 for architrave, 3 for frieze, and \$for cornice. The dimution at the top of the column should be never more than §, or less than § of the diameter at the bottom; and this proportion is observed by some in all the orders. (See Plates VIII. and IX.)

\*\*Doric Order.\*\*—This is considered to be the most

Doric Ordor.—This is considered to be the most ancient of the five orders, and takes its name from Dorus, who, according to Vitruvius, built a temple of this order to Juno, in the ancient city of Argos. At first its proportious were far more massive than at present; remains still existing in which the height of the columns does not exceed four or five times the diameter of the base. The old form of the Doric had no projecting base; and, from this circumstance, the statement made above seems to be substantiated, that the first idea of a stone column was taken from the trunk of a tree; the flutings, which appear in very early specimens, being suggested by the splitting of the bark, from heat or other causes. In the very form of the ornamentation peculiar to it, it retains more of the primitive but than any other order; the triglyph, its characteristic mark, giving the ides of the project-ing joists sawn off close, and ornamented with trian-gular billets of wood, or pieces with the edges chamfered, and the mutules, or indentations, like the teeth of a cog-wheel, under the cornice, representing the ends of the rafters. The space between the trigly his is generally curiched with ornaments, the skull of an is generally curiched with ornaments, the skull of an an and fillets or garlands being the most common. The theatro of Marcellus is always mentioned as affording the best proportions for this order. The height of the column, taking, as before, the base as the unit of measurement, is 8, including base \(\frac{1}{2}\), or a little more, shaft 7; entablature 2, divided into 8 parts, being 2 for the architraws, 3 for the frieze, and 3 for the cornice. In the second stage of the Dorio order the proportion of the column was taken from the height of a man, which is, as nearly as possible, six height of a man, which is, as nearly as possible, six times the length of his foot. (See Plates VIII. and IX.)

Ionic Order.—This order is named after Ion, the son

of Xuthus, who is said to have built a temple to Diana, seeking to imitate, in the columns which adorned it, the grace and elegance of the female form. It seems to have gained favour among the early Greek architects because the proper adjustment of the various parts of the Doric entablature was attended with considerable the Doric entablature was attended with considerable difficulty. The column was lighter than that of the Doric order, being eight times the diameter of the base. A base was added, and the capital adorned with volutes (see Voturs); the shaft of the capital was also fluted. In the ancient Ionic columns the volutes were parallel to each other; but, in the modern form, were parallel to each other; but, in the modern form, the volutes project in an angular manner, as in the Composite order. Michael Augelo was considered to have originated this change; but one or two specimens have been discovered at Rome of columns with the volutes projecting angularly. The base and capital are often enriched; but it is, for the most part, plain in character. The modern proportions of the order are as follows:—Height of column 9, including base \$, capital  $\chi_{5}^{\prime}$ , and shaft  $8_{13}^{3}$ ; or, according to the mode of measurement used by architects, in which the diameter of the base of the column is divided into two parts of the base of the column is divided into two parts called modules, and each module into thirty minutes, the capital measures 21 modules; the height of the entablature is 2½ (diameters of the base), which is divided into 10 parts,—3 for the architrave, 3 for the frieze, and 4 for the cornice. (See Plates VIII. and IX.) Corinthian Order.—This order is similar to the Ionio many respects, the same form of base being need; and a similar entablature. The great point of difference is the capital, which is richly ornamented with the larges of the divise or nearther although the agent the

leaves of the clive or scanthus, although the acanthus is said to belong rather to the Composite order. The

### Architecture

proportion between the column and entablature is the same, the entablature being one-fourth the height of the column; but the column itself is more slender and graceful than those belonging to the orders already described, being 10 diameters in height. The base is half a diameter, and the capital rather more than a diameter, or about 70 minutes. It is said that the Corinthian capital was originated by Callimachus, a sculptor of Corinth, who flourished about 540 n.c.; and that it was suggested to him by the beautiful appearance of the leaves of a root of the acanthus growing round the sides of a basket which had been placed upon it. The basket had been covered with a tile, and, when the leaves reached it, they had curled over in an outward direction, forming a kind of volute. The in an outward direction, forming a kind of volute. The extent of enrichment of the column depends on the extent of eprichment of the column depends on the degree of adornment given to the entailature. In interior decorations the fluting of the column is sometimes filled up to about one-third of the entire height with what is termed "cabling," which may be carved in various forms. From the delicacy of its proportions and the richness of its decorations, it has been called the Virginal order by Scamozzi. (See Plates VII. & IX.) Composite Order.—This order, sometimes called the

Composite Order .- This order, sometimes called the Roman order, is exactly similar to the Corinthian in its proportions, but possesses greater capabilities for enrichment. It is supposed to have been formed by the Roman architects that flourished under the Cresars, the forman arentects that nonrished under the cassars, by the union of the Ionic and Corintinan orders, as the capital partakes of both styles, having the enrich-ment of acanthus-leaves which surround the capital, surmounted by the angular Ionic volute, ornamented with the same description of foliage. This arrangement tends to give a form of greater boldness and elegance tends to give a torm of greater boiliness abut degance to the Composite order. The best examples set found in the triumphal arch at Rome, created in honour of Vespasian and Titus. (See Plates VIII. and IX.)

The national character of a people has a marked influence on the style of architecture peculiar to it.

The poetic temperament and national pride of the

The poetic temperament and national prince of the Greeks were plainly shown in the beauty of design exhibited in their temples; while the ambition of the Romans appeared in their vast public works and private dwellings, all indicating a desire for worldly power, and individual, as well as national greatness. But with the rise and spread of Christianity, architectures are the statement of the st But with the rise and spread of Christianity, architecture soon received flew features, and a striking difference was shortly perceptible between heathen temples and Christian churches, the horizontal lines that marked the sacred architecture of Greece and Rome giving place to the light and free appearance of the pointed architecture of Christian Europe.

Mediaval Architecture.—As the styles of architecture originated during the mediaval period will be noticed as perceptible of the pointed architecture originated during the mediaval period will be noticed to the period will be noticed to the period will be noticed to the period will be separately under their respective headings. it will be

separately under their respective headings, it will be sufficient here to point out, that with the advance of the Christian religion, and the division of the empire of Rome into the Eastern and Western empires, fresh or kome into the Eastern and Western entires, fresh modes of building were rapidly produced. At Constantinople, or Byzantium, as it was then called, Byzantine architecture assumed a marked character, and was, in its turn, the parent style from which Arabian architecture sprung. At Rome, a style of building was conceived which has been called Romanseque; then came the Goths from the north, asserting their supremacy over the effeminate people of Southern Europe, and bringing with them architectural forms of strength and solidity which harmonized well with their rude customs and unpolished manners. These their rude customs and unpolished manners. These styles were gradually amalgamated and improved, and this blending of modes produced, about the 13th century, the Pointed or Gothic style, modifications of which have neen generally adopted by the architects of all European nations. The origin of the term Gothic is unknown; but Bloxam says that it appeared "about the close of the 17th century, when it was employed by such writers as Evelyn and Wren, as an epithet intended to convey a feeling of disesteem for the structures of mediaval architecture." It is generally used to denote the modes in which all buildings of the Middla Ages were constructed, referring more parused to denote the modes in which all buildings of the Middle Ages were constructed, referring more particularly to those styles in which the pointed form of nrch was especially used. It is applied to all forms of English ecclesiastical architecture, from the 6th to the 17th century. (See NORMAN, SEMI-NORMAN, 117

## Architrave

EARLY ENGLISH, DECORATED ENGLISH, FLORID OR PERPENDICULAR ENGLISH, and DEBASED ENGLISH styles.)

Modern Architecture .- To the decay of the feudal system, and the subsequent suppression of the monas-teries by Henry VIII., may be traced the gradual decline and fall of Gothic architecture, until, in the time of Elizabeth, it had assumed a form which rapidly passed into what is called Debased English, in which the use of the arch was almost superseded by the adoption of the architrave. There was then a per-ceptible inclination to return to the old classic styles ceptible inclination to return to the oid classic styles of Greece and Rome, and this tendency splainly shown in the churches, museums, theatres, and other public edifices that have been erected since the reign of Charles I.; among which may be mentioned St. Paul's Cathedral, built by Sir Christopher Wren. In the or the Gothic style of architecture, which, although pre-eminently suited for buildings of an ecclesiastical character, is not well adapted for the construction of character, is not well adapted for the construction of public offices or private dwelling-houses, as the comfort of the interior is too often disregarded for the sake of the symmetry of the exterior. The architecture of every country and age must be adapted to the requirements of the times and general progress, and every building, whatever it may be, must be especially contrived to suit the purposes for which it is required; and, although it may be produced out of any of the styles of architecture that have freviously existed, it should never be designed with slavish adherence to the ascented rules for the construction of either of should never be designed with slavish adherence to the accepted rules for the construction of either of them, but to suit every needful demand for convenience and utility, modified in outward appearance, in all cases, to suit the locality in which it may be placed and the objects by which it may be surrounded. In exemplification of this, no better proof can be adduced than that peculiar form of building, always marked, and often picturesque in character, which has sprung, up since the unroduction of railways, and may, with up since the introduction of railways, and may, with propriety, be termed railway architecture. The more important architectural features will be found under their several heads (see ARCH, COLUMN, CORBEL, &c.);

their several heads (see Arch, Column, Corbel, &c.); while buildings of a particular nature (see, Amphitheatre, Basilica, &c.), and parts of buildings (see Basment, Roof, &c.), will also be separately described.—Ref. Bloxam's Gothic Architecture; Glossary of Architecture; English Cyclopadia—Arts and Sciences. Architecture; Maglo-Saxon.—The period during which this style of building prevailed in England extends from the arrival of St. Augustine, in 597, to the middle of the 11th century, or the Norman invasion. It is characterized by great simplicity. The following are its peculiar features:—The semicircular arch of brickwork similar to the arches of the Romans; the walls formed of rough masonry or rubble-work, with a walls formed of rough masonry or rubble-work, with a tie or bond of hewn stone at the angles, and narrow ribs of the same material running up the wall at intervals, dividing it into long and narrow sections resemvals, dividing it into long and narrow sections resembling panels; the doorways and recesses generally with semicircular headings, though many are found with headings of a triangular form, rudely constructed with long blocks of stone, inclined towards each other, and supported on imposts projecting over the jambs. The long blocks of stone, inclined towards each other, and supported on imposts projecting over the jambs. The belifty windows are also peculiar in form, consisting of two semicircular-headed lights, divided by a column resembling a rude baluster. They are distinguished from windows of the Anglo-Norman style of similar construction by the double splay of the jambs, the space from side to side of the whole aperture being narrow in the centre and becoming wider both towards the exterior and interior of the wall. There are many old churches in Northamotonshire, amone which may old churches in Northamptonshire, among which may be named those of Brixworth and Barnack, that afford excellent examples of the coclesiastical architecture of the Anglo-Saxons.—Ref. Bloxam's Principles of Gothio Architecture

Architecture.

ARCHITRAVE, ark'-i-traiv (Gr. arckos, chief; Lat. trabs, a beam), in Arch., the beam, or portion of the entablature that rests immediately on the columns. The architrave is a prominent feature in the Egyptian, Greek, and Roman styles of building: it was superseded by the arch in mediaval architecture. The use of the architrave and arch respectively forms the most striking point of difference between ancient archi-

tecture and the different styles of the Middle Ages. The architrave of a door is the moulding and woodwork surrounding the opening, the head being called the

distel, and the sides the jumbs.

ARCHIVES, ar'-kiess (Gr. archeia, public registries), strictly, the record office in which public papers and documentaare kept; but, by a common figure, the term is also applied to the papers or documents themselves. Some derive the word from area, 'a chest,' wherein the records, charters, and other papers and evidences of a state, house, or community, are preserved. The urchives of ancient Rome were in the temple of Satura. The principal depositories in England for public records are the Record Office, the Tower of London, and the British Museum. (See RECORDS.)

ARCH-LUTE, a large lute, or double-stringed by the



ARCH-LUTE.

orbo, formerly used by the Italians for the base parts, or as an accompaniment to or as an accompaniment to the voice. In Corelli's so-natas, the base staff is as-signed to the violone; i.e. double base, or arcilento. According to Kircher, this instrument was about five feet in length, and propor-tionately large in the body. It had fourteen notes, the highest whereof was A, the fifth line of the base; and the lowest, the double G below. It is supposed to below. It is supposed to have been invented in the 16th century, and, in the be-giuning of the last century, was much in use. Haudel himself employed it in several of his earlier operas. In the Chapel Royal, the office of lutenist still continues a part of the estab-lishment, although its duties have ceased for nearly a hundred years.

ARCHOGRAPH. CLOGRAPH.)

ARCHON, ark'-on, is a Greek term, signifying literally a ruler or commander, and was the title given by the Athenians to their chief magistrate. On the by the Athenians to their chief magistrate. On the abolition of the regal government in Athens, after the death of Codrus, the chief power was vested in his son Medon, with the title of archon. He held the office for life, and it was continued in his family for a considerable time. They were, however, responsible to the people for the acts of their government. In 752 n.c., the term of office was limited to ten years, and, in 714, the exclusive right of the Medon family to the office was abroarded and it was throw over the office was abrogated, and it was thrown open to all once was abrogated, and it was thrown open to all persons of noble birth. About 683 the duration of the archonship was limited to one year, and eight others were associated with him in a council of state, who were also termed archons. The first was called the archon, and had also the title of eponymos, or namegiver, because the year in which he served was named after him; the second was study head. after him; the second was styled basileus, or king, and had the care of religious matters; the third was polemarches, or commander in-chief; and the remaining six were styled thesmotheta, or lawgivers. Solon made the qualification of archon to depend not on birth, tiut on property; and Aristides abolished the property qualification altogether, and threw open the archon-ship and other magistracies to all the citizens. From the time of Solon downwards, the popular assembly continued to encrosch more and more upon the powers of the archons, who at length sunk from ministers of state into high municipal officers. They appear to have been originally elected by suffrage, the franchise being probably confined to the noble class from which being probably confined to the noble class from which they were taken. The right of suffrage was probably enlarged by Solon, and, in later times, the election was made by lot.—Ref. Smith's Dictionary of Greek and Roman Antiquities; English Cyclopadia.

ARCTIC AJA. (See TIGER-MOTH.)

ARCTIC, ark'-tik (Gr. arktus, a bear), in Astron., a crown applied to the north pole, or the pole raised place, from its being usually covered with sand. It is

above our horizon. It receives its name from the constellation of the Little Bear, the last star in the tail of which nearly points out the north pole.

ARCTIC CIRCLE, in Astron., a circle of the sphere paralleleto the equator, and distant from the north pole 23° 30′. This and its opposite, the Antarctic Circle, are also called the Polar Circles, wherein the largest day and because they have a three than the contract of the co longest day and longest night are 21 hours, and within which at one time of the year the sun never sets, and

which at one time of the year the sun hour, at the opposite season never rises.

ARCITE FOX. (See FOX.)

ARCITESTAPHYLOS, ark-tos-tiff-i-los, in Bot., a gen. of plants belonging to the nat. ord. Bricacea.
The species A. uva-uvsi, the common bear-berry, is In e species A. wa-urs, the common bear-perry, is found wild in the mountainous parts of England and Scotland, and generally over the whole of Northern Europe. It is a trailing shrubby plant, with leathery dark-green leaves. The flowers are white, tinged with pink, small, and in clusters; the berries small and red, resembling those of the hawthorn. The whole plant possesses astringent properties, and is sometimes used in tanning, and for dyeing a greyish black. The leaves are frequently employed as medicinal agents in those cases where vegetable astringents are required; they have also been used as an antidote in poisoning by ipecacuanha.

ARCTURUS, ark-tu'-rus (Gr. arktos, the bear, and oura, tail), a star of the first magnitude, in the constellation Boötes, or Arctophylax. The star is so called because it is situated near the tail of the Bear. It was supposed to be the nearest star to our system visible in the northern hemisphere; but this idea is now

exploded.

ARDEA. (See HERON.)
ARR, ar, the modern French measure of surface, which forms a portion of the new decimal system adopted in France. It is obtained as follows:—The adopted in France. It is cotained as 1010ws:—Into metre, or measure of length, being the 40,000,000th part of the whole meridian, as determined by the survey, is 3:2809167 English feet; and the are is a square, the side of which is 10 metres long. The hectare is gene-rally used in the measurement of land. It is 2:4711095

English acres; or 4012 hectares make 1,000 acres English measure.

AREA, air'-e-a, denotes the same thing as superficies, or quantity of surface; but is applied exclusively to plane figures: thus, we say, the surface of a sphere; the area of a triangle. The word is also used to signify any open space; whence in modern houses, that por-tion of a site which is not built upon is generally termed the area. I. Math., the measuring unit of every area is the square described upon the measuring unit of length: thus, we speak of the square inches, square feet, or square miles which an area contains.

ARECA, a-re'-ka, in Bot., a gen. of plants belonging to the nat. ord. Palmacea—the Palms, containing two species, each remarkable for the purposes to which it is applied. A. Catechu—the betel-nut palm, has been described as the most beautiful palm in India. The stem is remarkably straight, and often from 40 to 50 stem is remarkably subsigns, and notes from the confect high, and generally about 20 inches in circumference. It is cultivated throughout India for the sake of its seeds, which are known as betel, areca, and pinang nuts. The nut is one of the ingredients in the pinang nuts. The nut is one of the ingredients in the famed masticatory of the East called betel (which see). Charcoal prepared from the nuts, and termed areca-nut charcoal, is used in this country as a tooth-powder; but it is doubtful whether it is in any way superior to ordinary charcoal. An extract is made from the nuts in the south of India; and this constitutes one of the commercial varieties of catechu (which see). The timber the leaf staller and the matter that the contractions of the commercial varieties of catechu (which see). The timber, the leaf-stalks, and the spathes of this palm are timier, the seat-states, and the spaties of this post and made use of for various purposes; and in Malsbur an inebriating beverage is prepared from the sap. A. oberacea, the cabbuge-palm, is a native of Jamaica and other West-India islands. The trunk, which is seldom observed, the cumple-paint, is a matter of a consider of the thirds is laint's. The trunk, which is seldom more than six or seven inches in dismeter, grows to a height of from 100 to 200 feet. This majestic palm is frequently cut down for the sake of the single terminal bad, called the cubbage, which is esten either raw or bailed as a wagetable.

### Arenaceous

now frequently used in a general sense to denote a place where any contest or display of power takes

ARENACEOUS ROCES, de e - nai'- shus (Lat. arena and), in Geol, are those composed of grains of said, or which contain sand in any notable degree, as grits and sandstones. Compound rocks containing sand are termed Arenacce-arithmosely Arenaceo-calcarsous, and so on, according to their composition.

ARENG. (See GOMUTO.)

ARENGOLITES, är'-en-i-ko-lites, in Geol., a term applied to circular holes or markings which have been observed on the upper surface of many sandstones, and which are supposed to have been worm-burrows, like those of the arenicols or lob-worm.

ARKOLA, dire'-o-lä (Lat., a small open space of circle, diminutive of area), in Anat. and Physiol., is applied to the small interstices of minute cellular or other tissues, through which the smallest vessels and nerves . It is also applied to the small red or brownish กลระ circle which surrounds the nipples of females, or the ring which surrounds the pustule of small or cownoë.

AREOMETER, ar-s-om'-c-ter (Gr. araios, thin, metreo, I measure), a term sometimes applied to the instrument commonly called hydrometer. (See Hydrometer, a term sometimes applied to the instrument commonly called hydrometer. (See Hydrometer, a term of the hydrometer), are open of the hydrometer and the instrument of the hydrometer of hydrometer of the hydrometer of hydrom

Mary), was the name of a nil or rocky eminence ying to the west of the Acropolis at Athens, and was the place of meeting of the chief court of judicature of that city, hence called the Council of Areopagus. It was of very high antiquity, and existed as a criminal tribunal loug before the time of Solon. He, however, so far changed its character and constitution, as to be in some measure entitled to be called its founder. He in some measure entitled to be called its londer. He enlarged its sphere of jurisdiction, and gave it extensive powers of a censorial and political nature. He made it to consist of exarchors, who had passed with credit the acrutiny they were subjected to at the termination of their period of offlice. As a court of justice it took cognizance of capital crimes, as murder, arson, &c.; and it also exercised a certain control over the ordinary courts. Its censorial duties were of a very extensive and inquisitorial nature, for the preservation of order and deceney. Religion was also within its jurisdiction, and impiety in any form was punished by it. Pericles succeeded in greatly diminishing the power of this council, and deprived it of many of its hereditary powers. It still, however, seems to have retained a great degree of power; but in later times, retained a great degree of power; but in ager times, when corruption of manners came to presail among the people, it necessarily pervaded also the members of the council, which thus, in a great measure, lost its moral influence and authority; but it continued to exist down to a very late period. Some hold that the apostle Paul was taken before this council; but the Scripture does not bear out this idea. It seems rather that the Athenians had taken him to the hill in order to hear him expound his new doctrines.

to hear him expound his new doctrines.

ARGALA LEPTOPTILOS. (See ADJUTANT.)

ARGALA LEPTOPTILOS. (See ADJUTANT.)

ARGALA (Oris Ammon), in Zool., a species of wild sheep inhabiting the mountains of Siberia, Kamschatka, and the higher regions of the Himalayas. Dr. Hooker, in his Himalayan Journal, thus describes the animal:—"We came suddenly upon a flock of gigantic wild sheep feeding on scanty tufts of dried sedge and grass: there were twenty-five of these enormous animals, of whose dimensions the term when gives no idea they are a learned at the second standard and the second standard at the second second standard at the second sec onormous animus, of whose dimensions the term sheep gives no idea; they are very long-legged, stand is high as a calf, and have immense horns, so large that the fox is said to take up his abode in their hollows when deteched and bleaching on the barren mountains of Thibet." The horns of the male of this species of wild sheep are about 4 feet in length and 14 inches in circumference at their triangular-shaped

14 mones in circumterence at their triangular-shaped base. The name of the nuimal is Mongolian. The Rocky-Mountain Sheep, or Big-horn, has also been termed the American Argaii. (See Sheke).

Angand Lamp, ar-gand, a kind of lamp invented by M. Argand, a Frenchman. It consists essentially of a reservoir, from which proceeds a tube carrying the oil to the burner. The burner is a cylindrical tube, within which is inserted another tube of similar form, the diameter of which is a curatter of an inch loss the diameter of which is a quarter of an inch less tart in sma than that of the outer one. Between these two is of Tarran.) Argol

placed the wick, which is also tubular, and can be raised or lowered by means of a screw or rack. To the lower part of the burner is screwed a cap to prevent the oil falling through, but with holes in the upper portion to allow the air to pass upwards. A glass tube with a shoulder is fitted over the burner, and creates a draught both inside and outside the wick, which is still further concentrated upon it by means of the shoulder inst mentioned. The draught means of the shoulder just mentioned. The draught causes an increased supply of oxygen, and consequently a more complete combustion and a brighter flame. The same principle is applied to gas. Dr. Frankland has lately contrived an argand burner in Frankind has lately contrived an argand burner in which the air passes the heated portion of the glass tube before reaching the flame, which thus becomes supplied with hot air instead of cold. This contrivance effects a saving of 50 per cent. of fuel, whether oil or gus. Efforts have been made to construct candles in this way, but as yet without success. Furnose made on the argand principle—i.e. with streams of air introduced into the centre of the flame—are now much need in metallurgical operations. used in metallurgical operations.

used in metallurgical operations.

ARGEMORE, ar-gen'-o-nc, in Bot., a gen, of plants belonging to the nat. ord. Papaverace, the Poppy family. A mexicana, the Mexican or gamboge thistle, is an annual herbaceous plant, with large yellow flowers, and sessile, waved, and sinuated spiny leaves. It is a native of Mexico, but is cultivated in England and other parts of Europe as an ornamental plant. The seeds possess narcotic and purgative propertica, and an oil is obtained from them which has been recommended as a remedy for cholers. In the West Indies the seeds are used as a substitute for ipecacu-

anha.

ARGENT, ar'-jent (Lat. argentum; Fr. argent, silver), in Her., a term from the French, to express the metal silver in armorial bearings. It is generally left white in the fields and charges of all coats of arms, whether coloured or engraved.

coloured or engraved.

ARGENTAN, \*\*r-jen'-bin, German silver, 2 parts of copper, 1 of nickel, and 1 of tin.

ARGENTIFEROUS, \*\*ar'-jen-bij'-e-rits, silver-bearing.

Applied to minerals, veine, or metals containing silver-ARGENTIE, ar', jen-lite, one of the most important ores of silver. It is occasionally found in crystals, but more frequently in malleable blackish lead-coloured masses. It is found in granite and porphyry, in different parts of the world, and consists of 86 parts of silver to 14 of sulphur,

ARGENTOMETER, ar-jen-tons'-c-ter (Lat. argentum, silver; Gr. metron, a measure), a graduated cylindrical glass vessel employed for ascertaining the amount

of silver in a certain solution.

ARGENTEM DET, ar-jen'-tum de'-i (God's penny), was anciently the name given to earnest-money, or money given to bind a bargain. In some places it is called artes, or ertes, and by civilians and canoniste,

arrhæ,

ARGIL, or ARGOIL, ar'-jil (Gr. argillos, a white pure earth, from argos, white), clsy, lime, and sometimes gravel; also the lees of wine gathered to a certain hardness.—Ref. Law, Fr. Diet.; Cowell; Blunt.

ARGILE PLASTIQUE, ar'-sheel plas-teck (Fr., plastic clay), in Geol., the term applied to extensive deposits of sand, with occasional beds of clay, used for pottery, near the base of the tertiary system in France.

ARGILLACEOUS ROCKS, ar-jil'-lai'-she-us (Lat. argillow) in Geol.

ARGIDIACEOUS MOCKS, ar.jut.-lat.-she-us (Lat. argilla, cisy), in Geol., are those composed of clay, or having a notable proportion of clay in their composition; as roofing-slate and shale. All such rocks emit a peculiar odour when breathed upon. Compound clayer rocks are described as argillo-calcarcous, argillo-arcaccous, and so on.

ARGO, or ARGO NAVIS, ar-go, the ship Argo, a constellation, the greater part of which hes in the southern hemisphere. It is of considerable extent, and is divided by astronomers into four parts or regions.

Augor, ar'-gol, the crude tartar which is deposited

ARGOL, ar-got, the crude tarear which is by all wines as a crust upon the inside of the casks in which they are stored. Argol is the source from which are obtained tartaric acid and common cream of tartar, which is a tartrate of potash. Argo is dissolved in hot water, which, when cold, deposits the cream of tarter in small oblique rhombic prisms. (See CREAM

## Argonauta

ARGONAUTA. (See PAPER-NAUTILUS.)

ARGONAUTIC EXPEDITION, ar-go-naw-tik, in the Anc. Hist. of Greece, is an event frequently referred to by ancient writers; but the accounts given of it are very different. Generally it was an expedition under-taken by Jason in the ship Argo, to bring back the golden flesce from Colchis, and is usually said to have taken place about the middle of the 13th century before

ARGOSIE, arr-go-se, is a name given by old writers to a ship of great burden, whether for war or commerce. It occurs in Shakspere, Besumont and Fletcher, and others, and was probably derived from Argo, the name of the vessel in which Jason sailed in quest of the Calder Flaces. Golden Fleece.

ARGUMENT, ar'-gu-ment (Gr. argos, clear; Lat. argumentum), signifies properly that through which a conclusion is established; or, generally, it means any piece of reasoning expressed in intelligible language. a. Logicians have divided arguments according to their forms, into syllogisms, enthymemes, inductions, &c.; and specially recount various kinds of arguments which are usually reckoned as fallscies, but which are not necessarily so. They can only be accounted sophistical when they are employed with the intention to deceive the listener; that is, when they are unfairly used. Such are the argumentum ad hominem, or personal argument, where an appeal is made to the peculiar character and opinions of the opponent; the argumentum ad verecundiam, or appeal to our sense of reverence for some respected authority, or for some venerable institution; the aryumentum ad populum, where an appeal is made to the prejudices and passions of the crowd; the argumentum ud rem, or ad judicium, which bears directly upon the real question at issue. b. Rhetoricians again divide their arguments with respect to the topics from which they are drawn, irrespective of whether they are logically classified or not. These arguments are usually divided as follows:—1. Into regular and irregular; 2. into probable or moral, and demonstrative or nece sary; 3. into direct or indirect (the latter is largely used by geometricians as the reductio ad absurdum); 4. into those from example, from testimony, from cause to effect, from analogy, &c. Many of these rhetorical arguments will be found, on examination, to contain each other; but this the rhetorician does not regard, as his business is to touch the feelings of his audience, and not properly to convince them, which is the sphere of not properly to convince them, which is the sphere of the logician. c. The argument prefixed to a book, as to one of the divisions of Milton's Paradise Lost, is that which shows the purport or contents of it: and the same holds good for the devices on shields, &c., as the buckler of Milton's rebel angel, which was "ravious with boastful argument portraid." d. Lastly, an argument in astronomy is a quantity upon which an equation of these comments are radiating to the rection. tion or other circumstance relating to the motion of a planet depends.—Ref. Whately's works on the Art of Logic.

ARGUS PHRASANT, art-gus (Argus giganteus), a rare and beautiful bird, native of many parts of the Indian islands. The adult male measures between five and six feet in length from the beak to the extremity of the tail, and the plumage is wonderfully varied and

ARIADNE, ar-i-ad'-ne, one of the asteroids, or group of small planets, revolving between Mars and Jupiter, (See ASTEROIDS.) It is the forty-third in order of discovery, and was first noticed by Mr. Pogson, at Oxford, April 15, 1857.

ARIANS, air'-i-ans, a name usually given to all who adhere to the opinions advanced by Arius, a bishop adhere to the opinions advanced by Arius, a bishop of Alexandria, respecting the relation of the Father and the Son in the Holy Trinity. Athanasius alleges, in his second oration (§ 24), that Eusebius of Nicomedia and Asterius agreed with Arius in maintaining that God, being willing to create the universe, and seeing that it could not be subject to the working of his Almighty hand, made first a single being, whom he called Son, or Logos, to be a link hetween God and the world, by whom the whole universe was created. In other words, the followers of Arius maintain that Christ, the son of God, is the most exalted of all created things, but inferior to God the Father, and produced by his free will. The opinion itself was first broached about 318 A.D., and it was

## Aristocracy

publicly condemned at the council of Alexandria, which was held in 320 A.D., and in the council of Nice, which was held in 325 A.D. The orthodox church maintained the perfect equality of essence of both Father and Son, and could only express their relation by terming it eternal generation. The articles of both the Nicene and the Athanasian creeds arose out of this great Arian controversy. Arius and his party were banished by the former council; but as he had powerful adherents, he soon found means to return, at the express command of the emperor Constantine. He was on his way to receive the oath of ministerial allegiance to the orthodox views of the church at Constantinople, when he died, very suddenly, some said by poison, in 336 A.D. His followers gained great accessions after his death, and the emperor Constantino is said to have been baptized into the Arian communion a short time before his decease, in 337 a.D. Under Constantius, Arianism became the religion of the court; and it penetrated as far as Rome, which was obliged to receive into its communion an Arian bishop, Felix. But the divisions among the Arians themselves prepared for the Catholic church an easy victory over them, and led to their final extinction. The first split in the Arian faith took place in the western part of the Roman empire, where all opponents of the doctrine of Athanasius, that the Son was homeousies, or of the same essence with the Father, were called Arians; but some of these opponents clung to the doctrine already taught in the school of Origen, that the Son was homoiousies, or of similar essence with the Father. Those received the name of Semi-Arians; but the secti broke up into some ten or twelve separate communions before it finally disappeared from the history of the Church. But the Arians made a bold struggle for existence. They ascended the throne with Valens, in 304 A.D.; but Theodesius hurled them to the ground, and restored the dominion of the ancient church. The creed was altogether extinct in the Roman empire at the beginning of the 5th century. It continued to flourish among the Goths, the Suevi in Spain, the Burgundians, the Vandais, and the Lombards, among birgunatas, the vancais, and the Lombaras, among which latter people it survived down to 662 A.D. In England the doctrine was partially revived by Dr. Samuel Clarke and by William Whiston, and may still be occasionally met with in certain remote corners of society; but, generally, the name Anti-Trinitarians, or Unitarius, is preferred to the old creed of Arianism, which both of those sects profess

ARIES, air'd-ces (Lat., a ram), the first of the twelve signs of the zodiac, and a constellation giving its name to a space of 30° of the ecliptic, which the san enters in March, measured from the vernal equinox. Owing to the constant change of the position of the vernal equinox, arising from the precession of the equinoxes, the sign Aries no longer corresponds with the constellation of that name, but has moved about

30° to the westward of it.

Arillus, ü-rill-lus, in Bot., the term applied to an integument which is occasionally found covering, wholly or partially, the testa, or outer coat of a seed. The seed of the Passion-flower exhibits this covering, which commences at the base and proceeds towards the apex. In the nutmeg, the additional coat proceeds from above downwards, and constitutes the substance called mace, which is extensively employed as a spice.

ARIBEMA, "ir-i-se'-m", in Bot., a gen. of plants belonging to the nat. ord. Arace, the Arum family. The species A. atrorubeus, Dragon-root, or Indian Turnip, is a native of North America. From the tuber a nutritious fecula is obtained. In medicine, the tuber is also occasionally used, being given internally as a stimulant in rheumatism and bronchial diseases, and being also employed as an application to apthous affections in children.

Arista, or Awn, "-ris'-ti, in Bot., a solitary pointed bristle, growing in the flower of a grass, either from a

oristic, growing in the flower of a grass, either from a glume or from a palea. (See Graminaceze).

Aristocracy, är-is-tok-rà-se (Gr. aristokratia, the rule of the best; from aristos, best, and krateis, to rule), in its original acceptation, denotes that form of government in which the ruling power is vested in the best men, whether by birth, wealth, or personal distinction. Personal excellence, however, was usually regarded as

## Aristotelian Philosophy

a necessary element in the character of those consti-tuting an aristocracy. It was opposed to oliqurchy, which was regarded as a perversion of aristocracy, and in which the dominant power was in the hands of a few, who ruled for their own advantage. In the idea of who ruled for their own advantage. In the idea of aristocracy, therefore, was included that the administration of affairs should be for the general good, and not for any one class. In modern times, those governments have usually been termed aristocratic in which named privileged class of noble or wealthy persons either governed absolutely or shared the government, in various proportions, with the sovereign or the people. In a more general sense, it is applied to any form of government in which a minority of adult males congovernment in which a minority of adult males constitute the ruling class; and is opposed to democracy, in which the ruling power is vested in a majority of adult males. Lord Brougham's definition is somewhat different. "Where," says he, "the supreme power in any state is in the hands of a portion of the community, and that portion is so constituted that the rest of the people cannot gain admittance, or can only gain admittance with the consent of the select body, the government is an aristocracy; where the people at lurgo exercise the supreme power, it is a democracy. Nor does it make any difference in these forms of Nor does it make any difference in these forms of government that the railing body exercises its power, by delegation to individuals or to smaller bodies. Thus, a government would be aristocratic in which the select body elected a chief, to whom a portion, or even the whole of its power, should be intrusted. Sometimes the word eristocracy is applied not to any form of government, but to a particular class of persons in whate. In this sense it was nover used in ancient in a state. In this sense it was never used in ancient times; but it is common with modern writers. The f rmer distinction is dropped, and an aristocracy in this sense is not necessarily connected with the government, and may exist under any form of rule. It is in this way sometimes used as synonymous with nobility; in a wider sense, it is applied generally to the rich as distinguished from the rest of the community.

ARISTOLOCHIACEE, u-ris'-to-lo-ki-ui'-se-e, in Bot., a nat. ord. of plants of the class Dicotyledones, sub-class Monaclamydea, consisting of herbs or shrubby climbers, which are sparingly distributed in several parts of the world, but are very common in the tropical portion of South America. There are nine genera and 130 species. The typical gen. Aristolochia, Birthwort, is species. The typical gen. Aristologial, Birthwort, is distinguished by a tubular oblique periauth, generally inflated at the base, the mouth diluted on one side, and by stamens adherent to the style. Several species of this genus have been employed for centuries in of this genus have been employed for centuries in medicine, principally on account of their supposed commenagogue properties; and hence the name Birth-wort. The roots of A. longa, A. rotunda, and A. cle-matitis are most commonly used. They have all stimulant and tonic properties. The powdered root of A. longa is one of the ingredients in the duke of Portland's powder for the gout. A. anguicida is supnesed by Lindley to be the celebrated guaco of the Columbians. The juice of the root is said to stupefy snakes, so that they may be handled and played with. The rhizome and root-fibres of A. serpentaria, commonly called serpentary, or Virginian snake-root, are officinal. Serpentary was originally introduced as an antidote to snake-bites, but it is now known that it has no efficacy in such cases. It is a valuable stimuhas no checky in such cases. It is a vanuance some last, tonic, and disphoretic, and is especially useful in fevers of a low or typhoid character. The roots of A. reticulata, A. tomentosa, and A. hastata are said to be mixed in commerce with those of A. serpentaria. Several species of this important genus are cultivated in bothouses as ornamental plants.

Austrotella, ir-is-lo-le-li-n, in Bot., a gen. of plants belonging to the net. ord. Thiacce, the Lime-tree or Linden family. The most important species is A. Macqui, which produces an edible fruit, from which a

hind of wine is prepared.

Aristotelian Philosophy, ar-is-to-te'-li-an, is one of those systems of speculation which arose from the teachings of Socrates, and which, from the unity and grandeur of the genins of its founder, took a strong hold of the mind of Greece, and, since the revival of letters, of Western Europe. Aristotle attempted in his philosophy to steer a middle course between the high ideality of his master Plate and the low sensa-

tionalism of the physical school of Eles. It is said that he listened to Plato's lectures in the Academy for twenty years; that Plato was accustomed to call him, twenty years; that risto was accustomed to call him, by way of eminence, "the Thinker;" and that he was of small stature, and vain of his personal appearance. Whether the latter facts can be substantiated or net, he was unquestionably, perhaps, the forement scientific thinker that ever lived. His genius was wide as nature. the studied everything, and seemed to know everything better than every other body. His knowledge was quite amazing; and he extended the boundaries of science almost to an encyclopadic extent. Abstract science almost to an encyclopedic extent. Abstract science and physical science—nothing came wrong to him. His genius was at once lofty and minute, highly speculative and curiously detailed. Aristotle combated with much keenness the ideal theory of Plato, or that which expounded the Deity as holding in himself the archetypal ideas after which the world was fashioned, and which it was the business of Reason and Science to discover. But, while denying these ideas of his master, he nevertheless agreed with him in the view, that knowledge contains an element radically distinct. that knowledge contains an element radically distinct from sensation. He differed again from the Eleatics and the Epicureans, inasmuch as he denied that sensa-tion could account for the whole of knowledge; but maintained, with them, that without this sensation, knowledge would be impossible. The celebrated maxim, that "there is nothing in the intellect which was not previously in the sense," if not Aristotle's, at least expressed well a side of his doctrine; but, when he insists upon the distinction between the necessary rises altogether above the sphere of Sensation, and and the contingent, the absolute and the relative, he takes his place emphatically with the Reason. Thus he steered a middle course between what he regarded as the Scylla and Charybdis of speculation,—idealism and sensationalism; but in what precise line he moved is by no means clear. He nowhere has expounded his doctrines, and he is very charry of definition; so that no two Aristotelians of the present day are agreed respecting the details of his philosophy. Perhaps the best characterization of it is to say, that it was a system of empiricism, or one bused upon experience, modified, often considerably, by the rationalism of Plato. The language in which his philosophy is couched is brief, pregnant, and poculiar; and his system not only has afforded a test of the critical acumen of those who have taken to studying him, but it has afforded, besides, a nice test of advancement in the knowledge of the Greek language, to read Aristotle with intelligence and promptitude. Philosophy, according to Aristotle, is properly science arising from the love of knowledge. There are two sorts of knowledge, -mediate and immediate. From immediate knowledge, which we gain through the experience of particulars, we derive mediate knowledge, by means of argumentation, whose theory it is the office of logic properly to expound. Logic is therefore the instrument of all science; but only quoad formam, for it is experience which supplies the matter to be worked upon. The formal part of reasoning he accordingly expounds better than any man either before or since his time. He created logic indeed; and this system stands erect through the crumbling waste of centuries, like an Egyptian pyracrumbling waste of centuries, like an Egyptian pyramid, which heat and moisture cannot wear away. He nowhere defines logic; but the book which contains it is ordinarily called the Organon. His successors have only damaged when they have tried to improve his system of argumentation; and, down to the period of Sir William Hamilton, it remained nearly destitute of a single modification or addition. He bases his logic most profoundly upon the laws of contradiction, and of excluded middle, and he even recognizes that of sufficient reason as a registry entirely in the evolution of truth. After logic hat control recognizes that of summers reason as a regi-lative principle in the evolution of truth. After logic he took up nearly all the sciences, rational, empirical, and mixed, except one alone; viz., history. Ho acems to have divided philosophy into logic, physics, and ethics, or into speculative and practical knowledge. ethics, or into speculative and practical advances.

I. Speculative philosophy contemplates the roal order of things, irrespective of human control; practical philosophy deals with affairs voluntary and accidental. Real substances are either invariable or variable; while sublunary affairs are variable and perishable; the Deity of the property of th alone is imperishable and unchangeable. Do men pur-

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are the real in an abstract way? Then (ta meta ta phusika) Metaphysics and Mathematics emerge. Do they pursue knowledge as to its objects? Then Physics, Cosmology, Psychology, and Theology emerge. 2. Practical philosophy again comprehends Ethics, Politics, and Economy. A word or two on each of these heads; and, first, of Speculative Philosophy. I. Physics, or natural philosophy.—Nature is the sum of all existences which are disclosed to us by our perceptive faculties. The knowledge of mature is properly the knowledge of the laws of bodies in motion. Nature, cause, accident, end, change, infinitude, space, time, and motion, are included in this science. The three elements of existence are matter, form, and privation; and change is possible as respects substance, quantity, quality, and place. Motion, like time, has neither beginning norend; and the first thing to which motion was applied was the heavens. In his Cosmology Aristotle discusses astronomy, using that term in its widest signification. It appears to the modern reader obscure and inconsistent, and is by no means satisfactory. Physiology is sistent, and is by no means satisfactory. Physiology is indebted to Aristotle for its first essay. The soul is, The soul is, according to him, the active principle of organized life. It is distinct from the body, yet, considered as its form or entelecly, it is inseparable from it. Its faculties are production, nutrition, sensation, thought, and will, or impulse. His remarks on the principle of Common Sense, on Consciousness, on Imagination, on Memory, and on Recollection, nearly all of which he was the first distinctly to recognize, are very valuable, and will repay a careful perusal even at the present day. Metaphysics, or, more properly, the first philosophy, according to Aristotle, is his attempt to science Being in the abstract. The leading characteristics of the latter existence he analyzes into the ten categories of substance, quantity, quality, relation, time, place, situation, possession, action, passion. With this arrangement he connected the question of the First Being, rangement he connected the question of the First Being, whose felicity is alone complete, and whose existence is alone immutable. II. The ruling idea of his Practical philosophy was that of a sovereign good, and final end or aim of action. This final end he denominated happiness, which is the result of the perfect energies of the soul, and is the highest of which our nature is capable. It arises from the perfect exercise of reason, and is ordinarily called virtue. This had describes as and is ordinarily called virtue. This he describes as the mean between two extremes, which is the character of nearly the whole of his philosophy. He distinguishes the moral virtues into the seven cardinal ones, of which Justice, in a sense, embraces all the rest. Under the head of Right, he distinguishes that belonging to a family from that belonging to a city. A perfect unity of plan reigns throughout his Morals, Politics, and Economics. Both of the latter have for their object to show how this perfect virtue, already described, may be attained in the civil and domestic relationships, through a good constitution of the state and the household. The principle of the science of Politics'is expediency, and its perfection consists in the suitableness of means to the end proposed. By this principle Aristotle proves the legality of slavery; sud all educa-tion he refers to the ultimate end of political society. Of Aristotle's successors, the only one deserving to be mentioned is Theophrastus, author of the Characteristics. This system long maintained its ground as distinct from that of Plato. In the Middle Ages it distinct from that of ratio. In the latitude lages in became degraded into a noxious system of barren formularies, which were in the end swept away by the revival of Platonism. All except his Logic, which will live for ever, is now nearly forgotten, except by a few

devoted students.

ARTHMETIC, d-rith'-me-tik (Gr. arithmetike, derived from erithmes), the science of numbers, or that portion of mathematics concerned with the properties of numbers. Every number is a ratio or relation ; that is to say, every magnitude, compared with another magnitude, is either equal, or greater, or less, and, therefore, has a certain relation to that with which it therefore, has a certain relation to that with which it is compared. Arithmetic is the art of combining these relations with one another, using for the purpose the signs themselves, by which the numbers are distinguished; thus, the four operations of addition, subtraction, multiplication, and division, include the entire science. For the facilitating of calculations and for commercial purposes, other useful rules have been

invented; such as proportion, interest, discount, decimals, extraction of roots, &c.; but they are but different applications of the four elementary rules. The origin of arithmetic is extremely obscure. According to Plate and Diogenes Laertius, arishmetic and geometry are of Egyptian origin; on the other hand, Josephus affirms, that Abraham, during his stay in Egypt, taught the inhabitants the use of numbers. The precise epoch in which numerical signs and the first methods of computation and calculation were discovered, is enveloped in equal mystery; but there can be little doubt that the decimal system, or method discovered, is enveloped in equal mystery; but there can be little doubt that the decimal system, or method of calculation by tens, originated from the custom of children reckoning by the fingers. (See DECIMALS.) Arabias philosophers were of opinion that it was from the people of India, during the alt or 10th century, that they borrowed the signs which we call Arabic, but which they call Indian numerals. It was not till the commencement of the 18th century that the science of arithmetic became disseminated in Europe. The Greek monk Planude, John Halifax, better known under the name of Sacro Bosco, and, since the invention of printing. Planude, John Halliax, better known under the name of Sacro Bosco, and, since the invention of printing, Lucas de Burgo and Nicolas Tartaglis in Italy, Clavius and Ramus in France, Stifelius and Henischius in Germany, and Buckley, Diggs, and Recorde in England, may be cited as the principal European arithmeticisms at the first dawn of the science. The employticians at the first dawn of the science. The employ-ment of the Arabic or Indian numerals, and the facilities afforded by algebra, have been the chief causes of the immense progress and development of modern mathematical calculations. (See ALGEBEA.) Arithmetic acquires several distinctive appellations from the particular manner in which it is used.—Decimal Arithmetic requires a series of ten characters, the Triamette requires a series of our enancers, the progression proceeding according to the powers of 10. The invention of decimal fractions, which has doubled the practical efficiency of our arithmetical system, is generally ascribed to Regiomentanus.—Duodecima!
Arithmetic, in which the multiples and divisors of unity proceed according to the powers of 12. This method is commonly used by artificers.—Political Arithmetic is the application of arithmetic to researches connected with the government of a country; such as its number of inhabitants, produce of soil, quantity of food required for consumption, &c.—Universal Arithmetic is the term applied by Newton to algebra, or the calcula-

tion of magnitudes in general.

ARK, NOAH'S, ark, the name given to the vessel built by Noah for the preservation of himself, family, and the several species of animals during the Deluge. Much labour and ingenuity have been spent in attempting to determine the form, size, materials, &c., of the ark, but with very little result. As it was not intended for sailing, but neerly to float idly upon the waters, there can be little doubt that its form was not that of a ship, but rather of a large floating house. We are told that it was 300 cubits in length, 50 cubits in breadth, and 30 cubits in height; but, from the great variety of measures of this name, it is impossible to determine its dimensions with any degree of certainty. It was made of gopher-wood, pitched within and without with pitch, and had three stories. It contained, besides the eight persons of Noah's family, one pair of every unclean beast and seven pairs of every clean beast, and of fowls of the air also seven pairs, (See DELUGE.)

ARE OF THE COVENANT, in the religious ceremonial

of the Jews, was a box or coffer of shittim-wood, made by Divine direction by the children of Israel in the by Divine direction by the children of Israel in the wilderness, and afterwards deposited in that part of the temple called the Holy of Holies. It was of an oblong form, two cubits and a half in length, and a cubit and a half in breadth and height; that is, according to the common estimate of the length of a cubit, 3 feet 9 inches in length, and 2 feet 3 inches in breadth and height. It was overlaid within and without with pure gold, and had on its upper surface a crown or border round about. At each of the four CORDETS WAS a rine of pure gold, into which were corners was a ring of pure gold, into which were inserted the two staves of shittim-wood, overlaid with gold, by which it was borne, and which remained there perpetually, even after it was deposited in the temple. The lid or cover of the ark, called also the Mercy-seat, was of the same length and breadth, and was made of

#### Arm



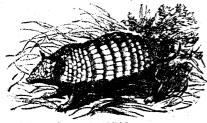
ARK OF THE COVENANT.

There was nothing within the ark save the two tables of stone on which were inscribed the ten command-

ARR, arm (Lat. brackium), is that part of the upper extremity of the body which extends from the shoulder to the wrist. It consists of two portions,—the arm, or brackium, properly so called, and the fore-arm, or anti-brachium; the former having one humerus: the latter two bones,-the radius and ulna. (See ANATOMY.)

ARMADA, ar-mai-da, or ar-mai-da, a Spanish word, signifying a naval armed force or fleet of war, but specially applied to the great Spanish fleet sent by Philip II. of Spain against England in 1588. It was composed of 150 vessels, carrying 2,650 guns, and having on board 20,000 soldiers, besides volunteers, and 3,000 scamen. It was styled by the Spaniards the "Invincible Armada." This vast armament was dispersed, and almost entirely destroyed, by the English Councia

ARMADILLO, ar-ma-dil'-lo (Dasypus), a gen. of mam-miferous quadrupeds, intermediate between the sloths and aut-eaters, and characterized by the possession of molar teeth only. Instead of hair, the armadillos are covered with a species of hard bony crust, forming three bucklers, on the rump, shoulder, and bead, respectively; the two latter being connected by a number of transverse movable bands, very similar in form and



ARMADILLO.

appearance to the plate-armour of the Middle Ages, from which, indeed, these animals have acquired their name of armadillos;—a name of Spanish origin, and a knight, baron, or other warrior, who was clothed adopted by English writers. The anterior surface of from head to foot (Fr. cap-a-pie) in armour, and was

## Armed at all Points

beyond the reach of the hunter, who has no other resource but to smoke out his obstinate game. Once brought to the surface, however, the animal becomes an easy prey, as its only defence is to roll itself up bedgehog-wise, and swait an assault. They are, however, by no means easily unkennelled, and have been known to allow a bunter to hack their tells off while they held on in the their tails off while they held on in the depths of their burrow by their powerful claws. The suimal never attempts to bite any one by whom it is attacked. Its food consists of roots, fallen fruits, and worms. Azara informs us that where armadillos abound, ants are sure to be scarce, as the animals break into the ant-hills and devour the insects as greedily as the ant-eater itself. It will not reject carrion, and has no soru-ples about violating a human grave, should an opportunity occur. The tropical and temperate regions of South America are the original and proper habitat of all the known species of the armadillo.

ARMAMENT, ar'-ma-ment (Lat. arma, throne of God, while the ark itself was his footstool, arms), denotes a force equipped for war, either naval. There was nothing within the ark save the two tables or military. It is also applied to weapons of war em-

ployed either in sea or land service.

Armanur, arm'-a-ture (Lat. armanur, armour), in Phys., a term applied to a piece of soft iron affixed to the extremities or poles of a magnet, in order that its magnetic power may be preserved; for when a magnet is allowed to remain long without an armature, a considerable diminution of its strength takes place, owing to the disturbing influence of terrestrial magnetism. (For an explanation of this phenomenon, see MAGNET, MAGNETISM.)

ARMED AT ALL POINTS, a term which, in the military language of the foundal age, was given to



ARMED AT ALL POINTS.

### Armenian Church

also provided with every weapon necessary for attack. Thus perfectly equipped for either defence or offence, the was said to be armed at all points. (See ARMOUR, and the respective terms there mentioned.)

ARMENTAL CHURCH, or me'nica, is a term applied to that section of the Christian Church which was established in Armenia. As early as the 2nd ceptury Christianity is said to have been introduced into the country, by the exertions of Bishop Gregory; and in the 5th century, by the exertions of Bishop Gregory; and in the 5th century the Bible was translated into the Armenian language by Miesrob. In the controversy respecting the two natures of Christ, the Armenians declared for the Monophysites, and formed themselves into a separate church, which they termed the Gregorian, after Bishop Gregory. They believe that Christ had only one nature, and that the spirit proceeds alone from the Father. They hold the "seven secraments;" but in baptism, with which they conjoin confirmation, they sprinkle three times, and dip as often. At the communion they see pure wine and leavened bread. Extreme unction is only administered to ecclesiastics, and that immediately after, and not before, death. They believe in the worship of saints, but not in purgatory. The head of the Church, called Cutholikos, resides at the monastery of Etschmiadzin, near Erivan; and to this place must every Armenian perform a pilgrimage once in his life. The secular pricests must marry once, but are not allowed to have a second wife. The Armenians, as a body, have always resisted all the attempts of the Roman Catholics to become united with them; yet there are certain of them in Italy, Poland, Galicia, Persia, and some parts of Russia, that have come under the papai supremacy; but they still have their own form of church government. From the wide dispersion of the Armenians, their doctrines are considerably different

ARMENIAK LITERATURE dates from the introduction of Christianity into the country, and its most flourishing period was from the 4th to the 14th centuries. Their writings are chiefly theological works and chronicles, and a great part of them are translations of Greek and Syrian authors, some of which are now only preserved to us through the Armenian; as the Chronicle of Eusebius; some of the writings of Philo; homilies by Chrysogtom, Severianus, and Basil the Creat, &c. The Bible, which was translated by Miesrob and his scholars, a.D. 411, is still regarded as the finest specimen of the classic style. The best edition is that published at Venice, 1805. Of Armenian historical and geographical works, several have been preserved to us. The most important theological and philosophical authors are David, the translator and commentator of Aristotle, and Esnik, both of whom flourished in the 5th century; Joannes Ozniensis, in the 8th; Nerses Klajensis, in the 12th; and Nerses Lampronensis. In poetry, the literature is very poor. With the 14th century, Armenian literature begins to sink, and only a few important works have since appeared at distant intervals. Yet have the Armeniano, even down to the present day, taken an active interest in their national literature; and in all their settlements the printing-press is to be found in operation. The most interesting of their settlements is that of the Mechitarista, on the island of San Lazaro, near Venice. The Armenian language belongs to the Indo-Germanio stock. The old Armenian, the language of literature, is no longer a living tongue; while the new, or vulgar Armenian, is split up into four dislects, and is much corrupted by Turkish.

ARRENIA, ar-meer'd-a, in Bot., a gen. of plants belonging to the nat. ord. Plumbaginacea. Thrift is the common English name for this genus, which includes many pretty species suitable for growing on rockwork and in pots. The dried flowers of the common thrift,

A sudgaris, are diuretic.

ARMGER, ar'mi-jer (Lat. arma, arms, and gerere, to bear), literally one who bears arms. The expression was formerly applied to the attendant or esquire of a knight. It is a term of dignity now obsolete, entitling the bearer to hold rank above a gentleman, but below knight. (See ESQUIRE.)

ARKILLARY SPREER, ar-mil'-la-re (Lat. armilla, a bracelet), an instrument representing the great circles of the celestial sphere, the equator, ecliptic, tropics, 124

## Arminians

equinoctial colure, &c. It is constructed of rings of metal, representing these circles, fastened together in their relative po-



ARMILLARY SPHERR.

their relative positions, and morsible on a axis passing through the poles: it is furnished with an horizon and meridian similar to those attached to the terrestrial and the celestial globes. It was formerly much used by the cally astroidmers, but is now superseded by the celestial globe. The earth on which the observer stands is supposed to be in the centre of this skeleton sphere.

senting the imaginary circles above named, traced on the apparent sphere of the heavens around him, by which the position of any star may be determined.

(See ASTROLABE.)

Aminians, armin'-i-das, are the followers, or those who entertain the opinions of, Arminius, a Protestant divine, who flourished in Holland about the beginning of the 17th century. He maintained that God had predestinated the salvation or condemnation of individuals only from having foreseen who would not when results of the control of Good market. and who would not accept of offered mercy. His chief opponent was Gomar, who, with the Calvinists, asserted that God had from all eternity, of his free good pleasure, elected some to everlasting life, while he had left others to unbelief and perdition. After his death in 1000 his children with his contract with the contract of the c death, in 1609, his followers rapidly increased, and were vehemently attacked by the Calvinists. In 1610 were vehemently attacked by the Calvinista. In 1610 they addressed a petition to the States of Holland for protection, from which they got the name of Remonstrants. The Calvinists put forth a counter-remonstrance, and, in 1614, the States issued an edict granting full toleration to both parties. This displeased the Calvinists, who continued their persecutions, and at length, in 1619, the doctrines of the Arminians were were driven from their churches, and their clergy were driven from their churches, and forbidden to exercise the ministry in public. In consequence of were given from their courtness, and sormated to exercise the ministry in public. In consequence of this decision, many left the country, and took refuge in France, England, and other places. The views of the Arminians are summed up in the following five articles:—1. That God had, from all eternity, determining the service of the country of the coun mined to save all who, he foresaw, would persevere in the faith, and to condemn all who should continue in the faith, and to condemn all who should continue in unbelief. 2. That Christ died for all men; but that only those who believe are really saved by his death. 3. That man is of himself incapable of true faith, and therefore must be born again, of God, through Christ, by the Holy Spirit. 4. That all good works are to be attributed to the grace of the Holy Spirit, which, however, does not force a man against his own inclination. 5. That God gives to the trule faithful the nation. 5. That God gives to the truly faithful the power to resist sin. With respect to the possibility of a fall from the state of grace, Arminius and his immediate followers were undecided; but his followers came afterwards to believe that it was possible. After 1630, the Arminians were again tolerated in Holland; but, from this time, their opinions underwent a considerable change. They have inclined more and more sucrease change. They have meaned more and more to freedom of thought and the rejection of creeds and confessions. They build chiefly upon the necessity of moral duties and good works, and allow each oue to interpret the Holy Scriptures for himself. They reject many articles of faith, and do away aimost entirely with the necessity of ancour from the Holy Spirit. The Arminians have, however, dwindled away to a very small body; but their tenets, more especially regarding predestination, have been adopted by various other denominations, as the Wesleyan Methodists, as

### Armistice

well as by numerous individual members of other

ARMISTICE, ar'-mis-tis (Fr.), is a truce or suspension of hostilites between two armiss or nations at war, by mutual consent. It sometimes takes place when both parties are exhausted; at other times it is had recourse to with a view to arrange terms of peace. It may be either general or partial; the former between two countries, the latter limited to particular places, as between two armies, or between a besieged fortress and the besiegers. The former in general requires ratification, but the latter is in the power of the commanders of the troops.

ARLET, arm'-let (Lat. armilla), a bracelet or large ornamental ring worn by the ancients upon the wrist or arm. With the Medes and Persians, it was worn by both the male and female sex; but, with the Greeks, it appears to have been adopted by the women only. The wearing of the armilla, or armlet, is of high anti-quity; and we read in 2 Sam. i. 10, that the Amalekite who slew Saul "took the crown that was upon his head, and the bracelet that was upon his arm." Although it was regarded as a mark of effeminacy for a Roman to wear this ornament, it was nevertheless a custom with the Roman generals to bestow armillæ upon soldiers, as a mark of respect for extraordinary deeds of valour. The materials out of which the





ARMLETS.

armillæ were made were as various as the designs into which they were fashioned, a twisted serpent being one of the most favourite forms. The Danes, Norse-men, and Anglo-Saxons also wore the srmlet. William of Malmesbury states that when, in 1940, Earl Godwin made peace with Hardicanute, he ratified it with a splendid present,—a ship the stern of which was inlaid with gold, and on board which were eighty magnificently-equipped soldiers, each wearing an armlet of pure gold weighing 16 ounces. Armlets of gold have been dug out of the bogs of Ireland, and several have been found in England.

ARMORACIA, ar-mo-rail-si-ā, in Bot., a gen. of plants belonging to the nat. ord. Crucifers. The species A. rusticana is cultivated for the sake of the root, which is the common horseradish, so much used as a condiment. The plant is frequently met with, growing wild by the sides of ditches and on the banks of rivers. A volatile oil, resembling oil of mustard, may be obtained from horseradish by distillation, and there can be no doubt that all the valuable properties of the plant depend on this principle. The odour of the oil is extremely powerful, that arising from a single drop being sufficient to fill a whole room. The root is considered to be antiscorbutic, anti-rheumatic, stimulant, diaphoretic, and diuretic, and is frequently used in medicine. Applied to the skin, it produces vessication. A syrup, made with an infusion of the root and sugar, has been used, with success, as a remedy for hoarseness, arising from relaxation. Burnett states that horseradish steeped in milk forms one of the heat averaging states that horseracisn steeped in mink horizon of the best cosmetics. As a dietetic, it is used scraped, or in the form of a sauce, with roasted meat and fish. When caten on an empty stomach, it is deleterious. Some lamentable cases of poisoning have occurred from the substitution of acouste, or monkshood root, for horseradish, which it is supposed to resemble. In the *Pharmaceutical Journal*, Bentley gave the following distinctions between the two roots:

### Armour

irritating; taste, bitter or sweet, according to droumstances, and very pungent. The roots of monisheed and horseradish may also be distinguished by the different appearances they present when scraped with a knife. The former will then be observed to be of a a kine. The former wat then be observed to be or a succulent character, and the acraped portions soon acquire a pinkish, or reddish hue; whilst the latter scrapes firm and dry, and does not after in colour."

scrapes irm and dry, and does not alter in colour. ARNOSIAL BRAENGS, ar-mori-dil, a term applied, collectively, to the shield and its charges, the creat, helmet, and motto, belonging to any gentleman entitled to bear arms. The supporters, belonging, with very few exceptions, solely to peers of the realm, are also included in this expression. It is, however, properly applied to the devices on the shield only. The assessed taxes on armorial bearings for persons chargeable with home-duty or for any agreement. only. The assessed states on armorial bearings for persons chargeable with house-duty, or for any carriage taxed at the rate of £3. 10s. annually, amount to £2. 12s. 4d. per annum, but for persons not so chargeable, 13s. 9d.

Armour, ar'-mor (Lat. armor), the name for all such habiliments as were used to protect the person of the wearer from the weapons of an enemy. From the ear-liest dawn of the historic era, we find mention of this defensive covering. Those ancient nations who were the most civilized, employed leather, brass, iron, and even gold, in the fabrication of their defensive clothing. Goliath of Gath, as is recorded in 1 Sam. zvii. 6, put on greaves to protect his legs, and Homer tells us, that at the siege of Troy the Greciums were "well-greaved." Even at this early period, the greatest skill and care were lavished upon the decoration to Homes the armour of will tarm leader. were layisned upon the decoration of the armour of military leaders. According to Homer, the golden armour of Glaucus was worth a hundred oxen; and, from the description in the Iliad, we may gather how highly ornamented was the shield of Achilles. The Eligin Marhles likewise frequently exhibit a Greek warrior wearing a beautifully-wrought helmet and cuirass. Nor was the war-dress of an ancient Greek less complete, in a defensive sense, than its elaborate ornamentation. In proof of this, we have only to give a minute description of the attire of a heavy-armed a minute description of the attire of a heavy-armed Greek soldier. Having his tunic already upon his body, he put on, 1. his greaves, or leg-guards; 2. his cuirass, or thorax, which, being composed of a back and breast plate, formed a defence for his chest, back, and abdomen; 3. his sword, which was suspended upon his left side by a bolt passing over his right shoulder; 4. his massive round shield; 5. his helmet; 6. he took up his spear. For further information as to these articles, see their respective headings. With the Egyptians, metal armour appears to have been worn only by the metal armour appears to have been worn only by the monarchs and nobility, the soldiery being defended by helmets of quilted linen, their shields being usually of wood. Among the Romans, the lorics, or cuirass, was originally of leather; but subsequently it was made of brass, like the rest of the Roman body-armour. The attire of a Roman soldier was substantially the same as that of the Greek warrior, already described. By Servius Tullius it was decreed that the military equipment of a Roman soldier should consist of six articles, —the ocrea or greave, the lorice or cuirens, the ensis or sword, the clipeus or shield, the cassis or helmet, and the hasta or spear (see these words). All these portions, except the spear, are alluded to in a celebrated passage of St. Paul (Eph. vi. 17). With respect to the armour worn in England, it is supposed that the early Britons had acarcely any other defensive armour than a shield. The Anglo-Saxons, however, possessed a more complete equipment. From old illuminated manuscripts, one of the laws of Athelstan, and other data, we learn, that at various periods they ment of a Roman soldier should consist of six articles, illuminated manuscripts, one of the laws of Athelatan, and other data, we learn, that at various periods they wore the shield, helmet, neck-guard, and breastplate, the whole of which is believed to have been made of leather or rough bides. They are also stated by Alcuin to have worn a well-fitting linen tunic, which "Aconite—root conical in form, and tapering perceptibly to a point: confiee-coloured, or more or less brownish externally; odour merely earthy; tasts at first bitter, but afterwards producing a disagreeable tringling and numbuses. \*\*Horseralisk\*-root slightly conical at the crown, then cylindrical, or nearly so, and almost of the same thickness for many inches; Norsemen, a tunio with long sleeves, and a hood and white, or with a yellow tinge; odour especially de-white, or with a yellow tinge; of white, or with a yellow tinge; of white, or with a yellow tinge; of when the Danes first arrived in Britain, their defensive covering appears the point of have consisted of a broad leather collar, encircing their neck and chest, and shin-pieces; but during the ohied of a broad leather collar, encircling their neck and chest, and shin-pieces; but during the ohied of a broad leather collar, encircling their neck and chest, and shin-pieces; but during the ohied of a broad leather collar, encircling their neck and chest, and shin-pieces; but during the ohied of a broad leather collar, encircling the intervence of the point of the way and the work of performed in Britani, their defensive covering appears to have consisted of a broad leather collar, encircling the reck and chest, and shin-pieces; but during the point of the same thickness for many inches; and the production of the same thread the point of the shield, or well-defensive covering appears and the point of the shield, or well-defensive covering appears and the poi

#### Armourer

or mascles. On their head they also were a conical skull-cap, probably of leather, from which pieces could be let down, and thereby afford a perfect protection for the whole of the face. This helmet was surmounted by an apex or circular knot, from which, as a centre, a painted circle of star-rays radiated. For offensive arms, they had battle-axes, swords, and spears. In the Norman period, an entire suit of armour, frequently termed harness, consisted of a casque or belmet, a gorgot, cuirass, gauntlets, tasses, brassets, cuisses, and leg-coverings (see these words). This was the usual wear of feudal lords, knights, and cavaliers, whether in battle or in the tournament, and was called armour cap-a-pic. It underwent various changes during the reigns of Bufus, John, Henry III, and Edward III. Until the time of the last-mentioned monarch, armour was generally of chain-mail; but, in the 14th century, plate-armony came into use, and, becoming more and more elaborate and richly-ornamented, reached its climax of splendour during the reign of Richard III., when it was often beautifully damascened and inlaid with gold. Fluted and engraved armour was much in fashion in the days of Henry VII and VIII.; but, in the reign of James I., the general use of armour fell into disrepute, and the steel coverings for the lower limbs were almost wholly laid aside. Charles I. endeavoured to revive the fashion of wearing a complete suit of armour; and we may learn how much attached he was to iron habiliments, from his being so often represented in them in paintings. The only armour worn in the days of the Protectorate was only armour worn in the days of the Protectorate was the helmet and cuirass, both of which are, by the way, still retained in several élite corps of the European armies, such, for instance, as the English life and horse-guards, the cent-gardes of France, the imperial guard of the czar of Russia, &c. These remnants of an iron-clad age may, however, be said to be less awardeally thus though an interesting recar serviceable than showy. An interesting paper, com-municated to the Society of Antiquaries by Sir Samuel Meyrick, explains the mode in which a knight attired himself in his suit of steel. He commenced with his tynes, or steel clogs; 2. his greaves, or shin-pieces; 3. his thigh-pieces, or cuisses; 4. his breech of mail; 5. his tuillettes, or overlapping pieces below the waist; 6. his cuirass, or breast plate; 7. his vambraces, or coverings for the arms; 8. his rerebraces, or coverings for the remaining portions of his arm to the shoulder; 9. his gauntlets; 10. he hung his dugger; 11. he put on his short sword; 12. he donned his cloak; 13. his on his short sword; 12. he donned his cloak; 13. his bacinet; 14. his long sword; 15. he took into his left hand his pennoncel; 16. he took up his shield.—When thus "locked up in steel," the knight was said to be armed cap-à-pie, an old French phruse for 'head to foot; in other words, he was armed at all points, either for offence or defence.—Hef. Meyrick's Critical Inquiry into Ancient Armor; Gough's Sepulchral Monuments; Hewitt's Ancient Arms and Armour; English Cyclopadia—Arts and Sciences.

Armoures, armorer, in the British army, is a

ARMOURE, ar-mor-er, in the British army, is a soldier whose duty it is to keep in repair the barrel, stock, lock, and other parts of the rifles, pistols, or carbines of the troop of cavalry or company of infantry to which he belongs. His remuneration for these services is regulated by a tariff of prices, and he is also paid by the captain of his troop or company a asso paid by the captain of his croop or company a penny a month for each soldier's rifle or carbine, the lock of which he is required to take to pieces and clean. In the British navy, the armourer is a warrant officer, assisted by a subordinate who is called armourer's mate. On ship-board the armourer has under his care

mate. On ship-board the armourer has under his care all the pistols, rifles, cutlasses, boarding-pikes, &c.

Arms, arms (Lat. arma), or weapons of offence, may be divided into two principal classes,—those that act by explosion, and those that do not. To speak first of the earliest of these arms, those wielded without the assistance of gunpowder, the simplest and most natural perhaps of all arms is the club; but the earliest affective weapons, properly so called werethe how and the earliest of these arms, those wielded without the assistance of gunpowder, the simplest and most natural perhaps of all arms is the club; but the earliest offensive weapons, properly so called, were the bow and arrises, and we read in Holy Scripture of Isaac telling Esau to take his bow and quiver, and go forth into the field and take venison (about a.c. 1760). Employed altitude take venison (about a.c. 1760). Employed with China, in 1860, with remarkable effect, invented altitude to the being required as a weapon of war.

## Armstrong Gun

The sling was, in all probability, its successor in mili-tary operations. Lucretius, tracing the progress of offensive arms, says :-

"Arma antiqua, manus, ungues, dentesque facre, Et lapides, et item sylvarum fragmina rami, Et flamme, atque ignes postquam sunt cognita primum ;. Posterius ferri vis est, grisque reperta;

Et prior æris crat quam ferri cognitus usus."

"Man's earliest arms were fingers, teeth, and nails, And stones, and fragments from the branching woods Then fire and flame they joined, detected soon, Then copper next; and last, as latest, traced The tyrant iron, than the copper vein Less freely found, and sturdier to subduq.")

After the bow and arrow, the pike, lance, spear, dart, javelin, dagger, mace, axe, chariot scythe, dirk, bayonet, sword, &c., came to be employed. The balista, catapults, and battering-ram, may be said to be the precursors of the modern artillery. The invention of gunpowder led to the introduction of an immense vaof gunpowder led to the introduction of an immense variety of weapons of offence, acting by the agency of this destructive compound. As most of these arms will be severally described at length under their own headings, it will not be necessary to furnish more than a brief enumeration of them in the present article. The hand-cannon, probably the earliest in date, was a simple tube fixed on a straight stock of wood, and furnished with a touch-hole and trunnions, like the large cannon of the present time. The hand-gun was cast in brass, and was used in England as far back as the year 1446, and rendered important service at the siere of brass, and was used in England as far back as the year 1446, and rendered important service at the siege of Constantinople in 1453. The arquebus, or harquebus, is mentioned as early as 1476. The harquebut, hakebut, or hagbut, differed from the arquebus in having a bent stock, an improvement which enabled it to be brought nearer to the level of the eye. The deraihaque was a long pistol with a butt curved almost into a semicircle. The musquet was invented by the Spaniards, and was first used at the battle of Pavis. The Italians invented the rose-lock, or wheel-lock, and introduced it into warfare about the time of Henry introduced it into warfare about the time of Henry VIII., as an improvement upon the matchlock. The snaphaunce superseded the wheel-lock, but was commonly used in the reign of Elizabeth, and was in turn supplanted by the caliver, carabine, esclopetta, and fusil. This latter,—from which the term fusilers, applied to certain of our English miantry regiments, was derived, was invented by the Freuch in 1630. During the certain of our linguist inlantly regiments, was invested by the French in 1630. During the reign of Charles II, the blunderbuss, so called from the Dutelf donderbus (thundering gun), seems to have been imported from Holland. Somewhat resembling this latter weapon was the dragon, so called from having the muzzle ornamented with a dragon's head. The conjecture is, that the modern term dragoons was derived from this weapon. The musket, a better form of firelock, continued to be used until quite a recent date in military operations; but, at the present time, date in military operations; but, at the present time, the rifle, the most complete portable weapon of offence acting by explosion, has become general throughout the armies of England, France, &c. The rifle is not, however, a newly-invented weapon, although it has lately been so wonderfully improved. (See RIFLE, BAYONET, &c.) For an account of non-portable explosions are accounted to the right of the righ sive weapons, see ABTILLERY.)-Ref. Gross's Military History; Sir S. Meyrick's Memoir on the Introduction of Fire-arms.

ARMS, BELLS OF, in Mil., a conical-shaped tent, which is pitched in the field, to contain the whole of the arms of a company of infantry. They are also called bell-tents," and are usually painted with the colours of the regiment and with the royal arms.

and qualities of the Armstrong gur, which render it poculiarly valuable in modern warfare:—1. Its light-ness in comparison with every description of cannon in general use, which it is rapidly superseding; the weight of an Armstrong 32-pounder and one of the ordinary kind being about 28 cwt, and 57 cwt, rethe ordinary kind being about 26 cwt. and 87 cwt. respectively. 2. The economy effected in the consumption of powder, half the quantity used to charge an ordinary cannon being sufficient for an Armstrong gun of the same calibre. 3. The great length of range attained, shot and shell having been thrown by this arm to a distance of more than five miles. 4. Its non-liability to injury arising from repeated firing, from the peculiar method used in making the gun. 5. The great accuracy of aim to be attained, objects of strail size being histographic fire and the control of th being histories times out of ten, at a distance of 4,000 or 5,000 yards, at which they are but just perceptible to the naked eye, the apparent size, at that distance, of an object ten feet square, being less than a postage stamp. 0. The adaptation of the convenient method of loading at the breech of the gun. And lastly, the peculiar construction of the clongated shells formed peculiar construction of the clongated shells formed of separate pieces, lifty in number, fitted together in an external covering of iron, and provided with fuses that can be regulated with such exactness, that the missile can be fired through a thick mass of solid tim-ber without injury to itself, or that explosion can be insured with the slightest degree of concussion, or at any point of its path between the muzzle of the gun and the object at which it is directed. To insure and the object at which it is directed. To insure strength, coupled with lightness and durability, the gun is made of pieces of the very best wrought iron, which are put together in a manner similar to that used in making gun-barrels out of nails, horseshoes, and pieces of iron rods, which are twisted round a steel bar, and hammered together. The bars used for the Armstrong guns are flat, and about two inches wide. They are brought to a white heat, twisted round a steel core, and then welded together; more bars are then twisted over these in a contrary direction, and then twisted over these in a contrary direction, and the process is repeated until the required degree of thickness is attained. The hollow cylinders of welded iron thus formed are about three feet long, and, from iron thus formed are about three feet long, and, from these pieces, guns of any desired length can be made, by fitting the ends carefully together, and joining them with rings of wrought iron. The bore of the gun is riled by machinery, with a large number of small grooves close together. These grooves form a complete twist round the bore in a distance of ten feet, and there are as many as forty in a gun of 2½ inches bore. It differs in this respect from an ordinary rifled gun, which has only two, three, or four grooves, and from the Lancaster and Whitworth guns, the former of which has an oval, and the latter a polygonal bore. which has an ovel, and the latter a polygonal bore. The shot and shell used for the Armstrong guns are clongated, the length being about three times the diameter. Bands of thin lead are attached to them, that they may take the form of the rifled interior of the bore when forced forward by the explosion of the charge, and acquire a rotatory motion as soon as they have left the muzzle. In order to load the gun at the breech, an aperture is cut into the bore at the breech end from the upper side, rather wider than the bore end from the upper side, rather wider than the bore itself, and long enough to admit the shot or shell, with the charge of powder, which is pushed forward into the bore by the hand. After loading the gun, this aperture is closed by a movable breech-piece, faced with a disk of copper, at the end next the charge. This disk is forced into the bore immediately behind the charge, by a screw which passes through the breech end of the gun, and presses forward the breech-piece when turned by the hand-lever attached to it: the copper expands at the moment of explosion, and prevents all escape of gas. The end of the breech-piece mearest the charge, as well as the copper disk, is bored vents at escape of gas. The end of the breech-piece nearest the charge, as well as the copper disk, is bored to receive a small discharging cartridge; and the touch-hole for the detonating plug which fires this eartridge is formed in the upper side of the breechcarriage is formed in the upper side of the breechpiece, and passes into the bore which contains it; so
that when the gun is to be discharged, the detonating
plug is struck, and the small discharging cartridge
thereby fired, which communicates its fire to the
charge. Many of our men-of-war and fortresses are
furnished with Armstrong guns of very large calibre,
time capable of discharging shot 100 lbs. in weight.

The lightness of the 9- and 12-pounders renders them well suited for field batteries and horse artillers. ARMY, orm'-e, is a term formed from the French word AREY, ormi-q, is a term formed from the French word armée, and denotes a body of men trained and disciplined for military service, under the command of a chief or leader, with a regular gradation of subordinate officers. This term is usually applied to the regular or standing army of a nation; sometimes, however, it is employed to include also the militia and volunteers. A number of regiments sent out on a particular expedition under the assumed of one person is also called dition under the command of one person is also called an army. The person in command is termed the general or commander-in-chief; when two or more allied armies are under the chief direction of one officer, he is usually styled generalissimo. A general has under him lieutenant-generals, major-generals, colonels, lieutenant-colonels, majors, captans, and subalterns. An army is composed of a certain number of corps, each consisting of brigades, regiments, battalions, and squadrons. Though people must have gone to war with each other at a very early period of the world's history, and must have soon recognized the importance of a certain amount of skill in carrying on their operations, yet it must have been come time later before they could be said to have had armies. The possession of a body of men trained and disciplined for attack or defence, denotes a comparatively high state dition under the command of one person is also called attack or defence, denotes a comparatively high state of civilization. The earliest trained army of which we attack or defence, denotes a comparatively num whose of civilization. The earliest trained army of which we have any account was that of Sésostris, king of Egypt, who flourished about sixteen hundred years before Christ. It was organized for the purpose of conquering the world, and consisted, according to Diodorns Siculus, of 600,000 infantry, 24,000 cavairy, and 27,000 war-chariots. In the reign of David, who increased the standing army which Saul had introduced, the Jews acquired considerable skill in the military art. Solomon introduced cavairy into the army, and also chariots. Subsequently, the Persians came to be distinguished for their military solievements. The strength of Subsequently, the Persians came to be distinguished for their military sohievements. The strength of their army, however, consisted in its cavalry, who were noted for their bravery, and impetuosity in attack. Their infantry seems to have been little better than an armed mob, and hence the repeated defeats that they sustained from comparatively small defeats that they sustained from comparatively small bodies of Greeks, The army with which Kerxes invaded Greece is said, including the sea forces, to have amounted to upwards of two millions and a half of fighting men. According to Arrian, Darrias brought into the field against Alexander 1,000,000 infantry, 40,000 cavalry, 200 chariots armed with scythes, and 15 clephants. Allowing for the exaggerations in these numbers, they still may be taken as evidence that the Porssian army was very great. In Greece split may numbers, they still may be taken as evidence that the Persian army was very great. In Greece, split up as it was into a number of petty states, a warlike spirit was early engendered. Hence we find that one great object of their rulers was to organize a physical training and an education specially fitting them for war. To the institutions of Lycurgus the Spartans were indebted for the military pre-eminence which they held among the states of Greece. They were taught to accustom the body to hardships and the mind to suffering, to despise luxury and refinement, and to practise abstinence and self-denial. Indeed, the entire training of a Spartan was with a view to making him a good of a Spartan was with a view to making him a good soldier; so that for skill and a high state of discipline, sonder; so that for skin and a high state of discipline, the Spartans were unrivalled among the Greeks. They paid great attention to arrangement, and were the first to introduce the phalanx, a particular mode of arranging the infantry. The Spartan phalanx was eight files in depth, the files in open or marching order being six feet apart; in close order, three feet; and in locked rect apart; in close order, three feet; and in location order, for receiving an attack, a foot and a half. The military system of the Athenians agreed in its leading features with that of the Spartans, but was carried out with less exactness. The Spartan was steady, devoted, and firm; the Athenian bold, enterprising, and dexterous. They had three classes of troops,—the heavyand arm; the Athenias bold, enterprising, and exterous. They had three classes of troops,—the heavy-armed infantry, who fought in phalant, armed with spears, swords, corsistes, and shields; the light-armed infantry, armed with light spears and shields; and a kind of irregular infantry, for harassing an enemy on the march, being armed with javelins, bows and arrows, and sings, but with no defensive armour. As regards the military strength of the Athenians, we see told that they had 10,000 heavy-armed troops at Marathon,

Army and 8,000 heavy-armed, and as many light-armed, at Plates. Philip of Macedon made several improvements in the arms and arrangement of his soldiers. He made the phalanz deeper and closer than it had been among the Spartens, and introduced spears 24 feet in length; so that in the phalanx the spears of the fifth rank projected three feet beyond the first rank. He also organized bodies of cavalry, first rank. He also organized bodies of cavalry, and was the first to maintain a standing atmy in Greece. The Macedonian army was further improved by his son Alexander, in the train of whose army we, for the first time in Greek history, find artillery in the shape of ballitic and catapultic. The strength of the Macedonian army in the time of Philip probably did not exceed 30,000 fighting men. During the reign of Alexander, however, it was much increased; and, at the battle of Arbela, the Macedonian army consisted of 32,000 havers armed infants. 16,000 light armed of 32,000 heavy-armed infantry, 16,000 light-armed infantry, and 4,000 cavalry, besides several thousand suxiliaries; making in all probably about 60,000 fighting men. The army of the Carthaginians differed from the Greek armies in that it was composed chiefly of mercenary troops, or at least levies from different countries; and yet these troops defeated the Romans in several pitched battles. Livy tells us that Hannibal in several pitched battles. Lavy tells us that Hainnoal set out on his expedition against Haly at the head of 100,000 foot and 10,000 horse; but that he lost 30,000 med in crossing the Alps. This seems to be an overstatement; for, according to Livy himself, Hannibal at Trebia had only 30,000 infantry and 10,000 cavalry, and at Canama 40,000 foot and 10,000 horse. Seeing, however, that Hannibal left two armies in Spain, the however, that Hannibal left two armies in Spain, the Carthaginian forces may be moderately estimated at, at least, 100,000 men. The Roman army in its best days surpassed in organization and discipline that of any nation that preceded it. The military age was from 17 to 48 or 50; and, in pressing emergencies, every citizen between these ages was obliged to serve as a soldier; but usually the more youthful of the population were preferred. Their training was of the severest description, not being confined to mere military matters but directed also to the descloyment of severess accertpion, not being commen to mere min-tary matters, but directed also to the development of their physical and mental powers, inuring them to labour, fatigue, and hardships, and inspiring them with boldness and self-reliance. The basis of the Roman army was the legion, which comprised both infantry and cavalry, and at first consisted of about 3,000 men; but afterwa rds the number was increased, till, in the later period of its history, it amounted to from 5,000 to 6,000 men. The legions were formed annually, the magistrates choosing from the different tribes of citizens those whom they considered best fitted for military service. A legion was commonly composed of from 1,200 to 1,500 or 1,600 hastati, who were young men in the flower of youth, and who were placed in the first line in battle; a like number of principes, or men of middle age, who formed the second line; and about mindle age, who formed the second line; and about 600 triaris, or veterans, who constituted the third line. Besides these, each legion had 300 cavalry and about 1,200 velites, or light infantry, who were the youngest men in the legion, and were armed with hows, slings, and javelins for harassing the enemy. When drawn up in order of battle, the hastati formed 10 ccrps, each corps having 16 men in front and 10 deep; the principes, or second line, were drawn up in the same manner; the triarii were also divided into 10 corps, but had only 10 men in front and 6 in depth. The velites had no particular station. Afterwards the legion came to be slivided into cohorts, without regard to the lines. There were 10 cohorts in a legion, 3 manipules in a school and 2 contains in a There were 10 cohorts in a legion, 3 manipules in a cohort, and 2 centuries in a manipule. Accordingly, in a legion of 6,000 men, a century consisted of 100; and hence its name. The cavalry were divided into 10 furms, or troops, and each furms into 3 decuries, or bodies of 10 men. The distinguishing characteristic of the legion was its astonishing mobility, by which it was emplied to adapt itself to every change and every variety of gircumstence. It was admirable suited either was empired to anapt useful to every change and every variety of circumstance. It was admirably suited either for attack or retreat. The arms of the heavy-armed infantry were a sword, the pilum, or heavy dart, and the pike. The pilum was originally a weapon only of the veterans, but afterwards was used also by the hostatis and principes. The pike was used only by the veterans. Their defensive armour consisted of a large

Army

made of wood and covered with a bull's hide; a helmet or head-piece of brass for covering the head, and formed so as to protect likewise the neck and shoulformed so as to protect likewise the neck and about ders; a outrass, or breastplate, made of brass, and about a foot square; and the ocrea, a boot or greave fortified with iron, and worn for the protection of the right leg. The light infantry had swords and javelins, and were also fushished with bows and slings. The cavalry had nearly the same armour as the heavy-armed infantry. The total number of Roman legions under Augustus was 25, under Alexander Severus 32; but, during the civil wars, the number was much greater. In the latter days of the empire, the luxury, corruption, and love of ease which characterized the Roman people, soon manifested itself in the army. people, soon manifested itself in the army. Their manners were corrupted and discipline was relaxed, till at length their aplendid army degenerated into a feeble militis, unable to withstand the attacks of the barbarians of the North, by whom the empire was at length overthrown. After the subversion of the Roman power, the feudal system which was introduced was hostile to great military achievements, or the establishment of large armies. Military service was the tenure ment of large armies. Military service was the tenure by which occupiers held their lands; and, while the by which occupiers held their isnut; and, while the barons enjoyed unlimited authority over their vassals, and were frequently at war with their neighbours, there were no great armies. In the lith century the Crusades roused the minds of men, and called forth the whole energy of Europe. Mighty armies were marched into Asia to deliver the Holy Land from the dominion of the internal control of the control of t of the infidels. Many sanguinary battles were fought; but the combatants on both sides were little better than tumultuous masses impelled by fanaticism to deeds of valour. Charles VII. of France was the first to introduce standing armies in Europe, after the fall of the Roman empire. After his war with England of the Roman empire. After his war with England (1445), under pretence of keeping always in readiness a force sufficient to defend the kingdom against sudden invasion, when he disbanded his other troops, he retained under arms a body of 16,000 infantry and 9,000 cavalry. He appropriated funds for their support, and appointed officers to command and discipline them. This occasioned an important change in the affairs and nolicy of Europe. By depriving in the affairs and policy of Europe. By depriving the nobles of that direction of the military force of the state which had raised them to such power and importance, a deep wound was given to the feudal aristocracy; while the establishment of a national force always at the command of the sovereign was a new and powerful engine for repressing their turbu-lence and strengthening the authority of the crown. The kings of France were enabled to carry on operathe kings of rance were enabled to carry on opera-tions with greater vigour and to a greater extent than formerly; and the expedition of Charles VIII, into Italy confirmed the superiority and reputation of a standing army. This led to an entire change in the military system of Europe. Those who had to contend with France had to adopt similar establishments, till at length standing armies became general all over Europe. Before this time the introduction of firearms had in a great measure changed the organization and equipment of the army. Personal courage, strength, and dexterity lost their exclusive importance, and the The advantages of regular tactics began to be felt, and war came to be more and more reduced to a system. It is usual to divide the history of armies in modern times, or since the invention of gunpowder, into seven periods. The first period begins with the employment of cannon, and extends to the campaign of Charles VIII. in Italy. The second period extends from the latter event to the commencement of the wars in the Netherlands, or from the end of the 15th to the middle of the 16th centuries. It comprises the wars of the French, Germans, and Spaniards in Italy. The third period comprehends the great war of independence carried on by the Netherlands in order to throw of the yoke of Spain, and extends from 1568 to the general suspension of hostilities in 1609. This war led to great improvements in the organization and tactics of armies. Improvements in the organization and tectures armies. By skill and discipline, a people, mostly merchants and manufacturers, howed down by oppression, were able to cope with and at length ignominiously expel from their country, the forces of the first power in Europe. The fourth period comprises the Thirty Years' war in

buckler or shield, 4 feet in length by 24 in breadth,

Army

Army

Germany, and extends from 1881 to 1648. In this war Gustavus Adolphus greatly changed the character and tactics of armies. He departed from the dense forma-tion of his predecessors, introduced lighter weapons, and made many improvements in the artillery, by which quicker and more complicated movements be which quicker and more complicated movements became practicable. The fifth period comprehends the wars of the French in Italy, in Germany, and in the Netherlands, as well as the Northern and Turkish wars, and embraces a period of ninety years, namely from 1648 to 1738. In the wars of Louis XIV., during this period, great improvements were introduced in the art of carrying on military operations, under such generals as Turenne, Luxembourg, and Condé, while opposed to them were Marlborough, Eugene of Savoy, and other aminent generals. Standing armies now and other emineat generals. Standing armies now attained an extent hitherto unexampled. Instead of the 14,00 men maintained by Henry IV., Louis XIV., after the peace of Nimeguen, had an army of 138,000 men. To this period, too, belong the wars of Charles XII., under whom the Swedish infantry attained a high degree of perfection. The sixth period includes the three Silesian wars, and extends from 1740 to the breaking out of the French Revolution in 1792. The Prussians had been for some time increasing their standing army and improving their military discipline, so that when Frederick the Great ascended the throne, in 1740, he found himself at the head of an army of about 80,000 men, in a high state of efficiency. This army he greatly increased and improved during his successive wars, till Prussian tactics became a pattern for all the other states of Europe. The seventh and last period extends from the period of the French Revolution to the present time. The standing armies and the military science of this period far outnumber and surpass those of any one preceding.—We shall conclude this article with a short account of the armies of the principal states, beginning with our own. The British army, according to the Army Estimates for 1869-70, consisted of 191,073 men of all ranks, of whom 63,707 are on the Indian Establishment. They are thus divided :-

Regiments.	Men.	Total.
Royal Horse Artillery	1,768	
Riding Establishment, Royal }	225	
Life and Horse Guards	1.308	
Cavalry of the Line	9,048	
Royal Artillery	15.384	
Royal Engineers	4.663	
Military Train	1,798	
Foot Guards	5,960	
Infantry of the Line	67,103	
Army Hospital Corps	1,004	
Commissariat Staff Corps	600	
Military Store Staff Corps	400	
West-India Regiments	2,901	
Colonial Corps	3.411	
		115,933
Depôts in the United Kingdom of Regiments in India		9,595
General and Departmental Staff		875
Establishments		434
Miscellaneous Establishments		529
Total British forces		127,366

The cavalry of the British army consists of the Royal Horse Artillery, two regiments of Life Guards, the regiment of Royal Horse Guards, seven regiments of dragoon guards, and twenty-one regiments of dragoons, both light and heavy. The infantry includes the regiment of Royal Artillery, comprising twenty-seven brigades, the Royal Engineers, the Military Train, Grenadier, Coldstream, and Scots Fusilier Guards, one hundred and nine regiments of foot, the Rifle Brigade, the Army Hospital Corps, Commissariat Staff Corps, three West-India regiments, and several colonial corps.—In the French army the duration of service in the active army is five years; at the end of this term the soldier enters the reserve for four years longer. The young men who have not been comprised in the active army have to serve four years in the

reserve and five years in the National Garde Mobile. The army is recruited by conscription; but the young men drawn for the active army are allowed to provide men drawn for the active army are allowed to provide substitutes. This privilege is not allowed to the men of the reserve. The government greatly encourages the re-enlistment of old soldiers. The price to be paid for substitutes is regulated by the government; in the year 1868, the Minister of War settled the price to be paid at £100. This sum goes to the army-fund, from which substitutes are paid a certain sum on joining the army, an increase of pay at the end of seven years, another at the end of fourteen, and a pension of a franc por day after forty-flve years, service. A years, snother at the end of fourteen, and a pension of a franc per day after forty-live years's service. A soldier is permitted to re-enlist so logs as he is fit for service. On the peace footing the organization of the French army is as follows:—Infantry: three regiments of imperial grenadier guards, 6,600; four regiments of imperial voltigenrs, 8,800; a hundred regiments of infantry of the line, 198,871; seven regiments of bassaurs 18,103, four regiments of Fourage. ments of chasseurs, 16,103; four regiments of Zonaves, 9,746; one regiment of African light infantry, 1,659; one regiment of foreign legion, 2,577; three regiments one regiment of roreign legion, 2,377; three regiments of triallieurs of Algeria, 6,000; one regiment of veterans and other troops, 2,296;—total, one hundred and twenty-four regiments of infantry, consisting of 252,652 men. Cavalry: one squadron of Cent-Gardes, 221; two regiments of carabiniers, 1,764; twelve regiments of currassiers, 10,915; thirteen regiments of drugoons, 11,631; nine regiments of lancers, 8,103; of dragons, 1,051; line regiments of mounted chasseurs, 11,676; one regiment of imperial guides, 1,047; eight regiments of lussars, 7,546; three regiments of chasseurs d'Afrique, 3,381; three regiments of spahis, 3,489; two regiments of remonté and cavalry school, 2,285; total, sixty-six regiments and one squadron of eavalry, with 62,793 men and 48,143 horses. Artillery: six with 62,799 men and 43,143 horses. Artillery; six regiments of foot artillery and sixteen regiments of horse artillery, comprising 32,850 men; two regiments of artificers, 1,639; three regiments of train artillery, 3,709; two regiments of armourers and gummakers, 1,634;—total, twenty-nine regiments of artillery, 16,636 horses, 39,852 men, and 1,362 guns. The regular army is completed by several regiments of expiners by the candarmeria and the trops of the engineers, by the gendarmerie and the troops of the administration. The latter consist of 1,174 staff administration. The latter consist of 1,174 stationficers, 819 chaplains, surgeons, and apothecaries; 370 veterinary surgeons; 5 companies of mechanics and engineers; 2,575 officers and privates of the Invalides; 2,490 officers and pupils of the military schools; 2,894 men of the Garde de Paris; 1,299 schools; 2,50s men of the Garde de Faris; 1,205 pompiers, and various other troops, amounting altogether to 15,066 men, with 5,442 horses on the peace footing, and 33,365 men and 12,000 horses on the war footing. We borrow from Martin's Statesman's Year-Book for 1870 the following tabulated statement:—

## Summary of the French Army.

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	PEACE F	COTING.	WAR FO	OUTING.
	Men.	Horses.	Men.	Eorses.
Staff	1,773	160	1,841	200
Infantry	252,652	324	515,937	450
Cavalry		48,143	100,221	65,000
Artillery	39.882	16,646	66,132	49,838
Eugineers	7,486	884	15,443	1,400
Gendarmes	24,535	14,769	25,688	15,000
Troops of the Ad- ? ministration }	15,066	5,442	33,365	12,000
Total	404,192	86,369	758,727	143,233

In the French army the staff is thus organized:—Nine field-marshals; 170 generals of division, of whom 40 are in the reserve; 340 generals of brigade, of whom 180 are in the reserve; there are 1,251 staff-majors, of whom 352 are in the reserve; finally, there are 75 military interpreters. All general officers must retiro from active service at the age of sixty-six; but there is an exception to this regulation in favour of generals who have commanded in face of an enemy.—The Prussian army:—The military organization of the kingdom, dating from the year 1812, is based on the principle, that every man capable of bearing arms shall receive military instruction and enter the army for a certain number of years. There are practically

some exemptions from military service, though no substitution whatever is allowed. Every Prussian subject is curolled as a soldier as soon as he has completed his twentieth year. He has to be in service during seven years, of which three years—from 20 to 23—must be spent in the regular army, and the remaining four years—from 23 to 27—in the army of reserve. At the end of this term the soldier enters the 'landwehr,' or militia, for nine years, with liability to be called upon for actual practice, and to be incorporated in the regular army in time of war. Leaving the 'landwehr' the soldier is finally enrolled, till the age of 50, in the 'landsturm,' which body is only called upon for service within the frontier of the country in ease of invasion. There are various exemptions from this law of military service in favour of the nobility, clergy, and some other classes of the population. A certain amount of education and fortune constitutes also a partial exemption, inasmuch as young men of twenty who can pay for their own equipment and pass a light examination, have to serve only one year in the regular army, instead of three. But in this case the liability to service in the army of reserve—the landwehr and the landsturm—remains the same." Official returns made up at the close of last year gave the strength of the Prussian army as follows:—

Officers.	Rank & File	. Horses.
6,697	188,948	3,255
352		112
431		3
1,898	52,786	55,810
1,672	31,854	10,037
234	6,489	91
156	2,925	1,599
1,484	4,715	2,400
12,924	299,704	73,307
	6,697 352 431 1,898 1,672 234 156 1,484	352 8,480 431 3,512 1,998 52,786 1,672 31,854 234 6,489 156 2,925 1,484 4,715

The above tabulated statement shows the constitution of the Prussian army on a peace footing. On a war footing the numbers can be raised to 700,000 men. The mobilization of the reserve troops may be completed in about a fortnight's time.—The Russian army, according to the latest returns, is thus constituted:—

	On Peace	On War
1. REGULAR ARMY.	Footing.	Footing.
Infantry	364,422	694,511
Cavalry	38,306	49,183
Artillery	41,731	48,773
Engineers	13,413	16,203
Total	457,872	808,670
2. Army of 1st Reserve.		
Troops of the Line	80,455	74,561
Garrison Troops in Regi-	80,455	23,470
Ditto in Battalions	19,830	29,892
Total	180,740	127,923
3. ARMY OF 2ND RESERVE.		
Troops of all arms	254,036	199,380
General Total	892,648	1,135,973

In addition to the regular army there are the Cossacks, of whom there are in military service in various parts of the empire, in round numbers, 129,000 fighting men. We footing. — The army of Beigium is recruited by Robles, magistrates, clergymen, and students are exempted from serving in the Russian army; merchants and traders are likewise exempted. The regular army is recruited, chiefly by conscription, from the various of this army is,—Infantry, the artisan and peasant classes, every individual member of which is liable, with but few exceptions.—

The Austrian standing army is formed by conscription, to which every male who has reached his twentieth year is fished. The war footing of this army is,—Infantry, 74,000; cavalry, 7,903, and 6,572 horses; artillery, is well as about 25,000 minus.—

Every man who has reached his twentieth year is scribed at 40,000 men. In addition to the army there is the Garde Nationale composed of citizens between which are spent in active service, and the remaining 20 and 40 able to bear arms. The Garde Nationale

seven in the reserve. In addition to the standing army there is the landwehr, the term of service in which is twelve years. In the Tyrol and on the military frontier there is the landstum, or general levy of able-bodied men. The standing army of Austria is thus constituted:—Infantry: Eighty regiments of the line, 121,940 on a peace footing, 485,540 on a war footing; fourteen military-frontier regiments, 12,307 on a peace fobting, 53,923 on a war footing; one regiment of Tyrolese jäger and thirty-three battalions of field jäger, 20,251 on a peace footing, 54,463 on a war footing; twelve companies of ambulance and hospital service, 1,150 on a peace footing, 3,376 on a war footing;—total of infantry, 155,578 on a peace hospital service, 1,180 on a peace footing, 3,786 on a peace footing;—total of infantry, 155,578 on a peace footing; on a war footing 597,602. Cavalry: Fourteen regiments of dragoons, fourteen regiments of hussars, and two regiments of lancers, on a reace footing 35,793; on a war footing 58,794. Artillery: Twelve regiments of field artillery, 17,480 on a peace footing, on a war footing 43,836; twelve battalions of footrages and two hytellogy of recentain settliery. footing, on a war footing as,830; twelve nattained of fortrees, and two battalions of monatain artillery, on a peace footing 7,778; on a war footing 18,938;—total of artillery on a peace footing 25,658; on a war footing 62,774. The total of engineers and train on a peace footing is 9,868, on a war footing 45,134. Of miscellaneous establishments, consisting of the commissarint, survey, sanitary, topographical, and other departments, there are 23,858 on a peace footing; on a war footing 33,762. Total of Austrian standing army, inclusive of troops of reserve, 278,470 on a peace footing, 838,700 on a war footing. — The army of the kingdom of Italy is formed by conscription, the term of service being ten years. Should there be an interval of peace in these years, the men are allowed to go on furlough during half the period. Every male subject is liable to the conscription. According to the latest return, this army was thus consti-tuted:— Infantry of the line, 118,85°) on a peace footing, 303,122 on a war footing; bersaglieri, 14,727 trative troops, 4,463 on a peace footing, 8,215 on a war footing; military instruction, 2,964 on a peace footing, and the same number on a war footing;—total, 199,557 on a peace footing, 445,5(4) on a war footing.—The entire strength of the military forces of the North German Confederation amounts to 319,358 men on the peace footing, and to 977,262 men on the war footing.

The forces of Denmark comprise twenty battalions of infantry of the line, five regiments of cavalry, and trades bettering of writings. The total stages have twelve batteries of artillery. The total strength of the army, exclusive of the reserve, is 30,782 men and 1,068 officers on the peace footing, and 47,925 men, with 1,328 officers, on the war footing. In addition, there is a reserve. In the Swedish army there are ive distinct classes of troops: they are-1. The indelta, or national militia, maintained not by the government, but by the landowners, assisted by a cer-tain proportion of the income of the state domains. 2. The conscription troops, which are drawn by annual levy from the male population between the ages of 20 and 25 years. The privilege to purchase substitutes is allowed. 3. The enlisted troops. 4. The volunteers. 5. The militia of Gothland. With the exception of the volunteers, amounting to 40,000 men, there are in the volunteers, amounting to 40,000 men, there are in the army of Sweden 85,000 infantry of the line, 6,000 cavalry, 5,000 artillery, as well as about 48,000 militia.

—Norway possesses a separate army, consisting of 12,000 men on a peace footing, and 18,000 men on a war footing.—The army of Belgium is recruited by conscription, to which every male who has completed his nineteenth year is liable; but substitution is allowed. The war footing of this army is,—Infantry, 74,000; cavalry, 7,903, and 6,672 horses; artillery, 14,513, and 4,050 horses and 152 guns; engineers and train, 2,534 men;—total without officers, 69,70 men. In times of peace the strength of the army is pre-

## Army Agents

numbers 125,000 men without, and 140,000 men with, the reserve.—The Dutch army consists of infantry, 44,591; cavalry, 4,501; engineers, 1,125; artillery, 10,831; the colonial army consists of 12,287 Europeans and 15,182 natives.—The Spanish army, comprising the active army, the provincial militia, and the national guard, was as follows by the official returns —Infantry, 0,890; engineers, 2,368; cavalry, 11,840; provincial militia, 44,926; carabiniers, 12,002; national guard, 10,330.—The forces of Switzerland are divided into four classes.—I. The Bundesanzug, or federal army, which includes all men capable of bearing arms between the ages of 20 and 32. By the articles of the Swiss constitution, each state is oblined numbers 125,000 men without, and 140,000 men with, articles of the Swiss constitution, each state is obliged to furnish at least three per cent. of its population to the federal army. This class contains 85,138 men. the federal army. This class contains 35,138 men.

3. The army of reserve, consisting of all men who have served in the first class, from the age of 33 to
40. Affout one and a half per cent. of the population are taken for this class, which comprises 50,559 men.

3. The Landwehr, or militia, includes all men between the ages of 41 and 45. This class amounts to 64,823 men.

4. The Landsturm, or army of defence, which comprises all men capable of military service from the age of 45 upwards. The number of men in this class arrounts to about 150,000. Total of Swiss federal age of 45 upwards. The number of men in this class amounts to about 160,000.—Total of Swies federal forces, 350,020 men.—The Turkish army is composed of the Nizam, or active troops, and the Redif, or reserve. At the last return the whole numbered or reserve. At the last return the whole humbered about 216,000 men. — Before the war between the Federal and the Confederate states, the United States of North America possessed a very small army, amounting only to about 12,000 men; but during the struggle between the North and South, the Northerners had in the field an army of 600,000 men; whilst, for a long period, the South was not greatly inferior in numbers.—Ref. Martin's Statesman's Year-Book for 1870.

ARMY AGENTS are persons authorized by government to manage the monetary affairs of the different regiments in the army. Every regiment has its army agent, selected by the colonel, who draws money from the War Office, and applies it to the regular expenses of the regiment. Army agents further pay soldiers' remittances to their families, distribute prize-money, and manage the sale and purchase of commissions.

and manage the sale and purchase or commissions.

AEMY LIST is the name of a publication issued monthly by authority of the War Office, and containing the names of all the commissioned officers in the British army, the Royal Marines, militia, yeomanry, and volunteers, with the dates of their commissions, and other information of a like nature. The Annual Marine Little and the commissions of the sale of the sale of their commissions. Army List is a work of a similar kind, published also by authority, and giving "a list of the officers of the army, and of the corps of Royal Marines, on full, retired, and half-pay." The New Army List, published by H. G. Hart quarterly and annually, is a non-official work, but gives much more information, containing, besides the list of officers in the army and militis, with the dates of their commissions, "a statement of

what the dates of their commissions, "a statement or the war services and wemads of nearly every officer in the army, ordnauce, and marines." Amy Schools.—Of late years much has been done in the way of establishing regimental and garrison schools, for the education of our soldiers and their children. In 1889 upwards of 200 schoolmasters, and a like number of schoolmistresses, were so employed; and the annual sum expended in connection with these schools is nearly £40,000. Besides these, there are schools is nearly £40,000. Besides these, there are certain army educational establishments for the instruction of the officers, and for increasing the military efficiency of the men. The principal of these are the Royal Military Academy at Woolwich, the Royal Military College at Sandhurst, the Royal Hibernian Military School, the establishment at Chatham for the instruction of the Royal Engineers, £c., in military field-works samping mining nontroping the and they

## Army-works Corps

are then incorporated as a whole, and submitted to the Treasury for approval. They are then presented the Treasury for approval. They are then presented to the House of Commons, when the various items are to the House of Commons, when the various items are scrutinized, and it may be some of them rejected of reduced. The general plan of the estimates is the same from year to year, comprising the following great headings:—1. Forces; 2. Civil establishments; 3. Supplies; 4. Works and buildings; 5. Educational; 6. Non-effective. The following table gives the estimates of the expenditure under each division of these air head-increases the west from April 1 1889 to March 20. ings for the year from April 1, 1889, to March 31, 1870. The total strength of her Majesty's forces was 1870. The total strength of her Majesty's forces was establishment, leaving 127,396 men and 11,701 horses to be provided for by the estimates:

I.—I	REGULAR	FORCES.

I REGULAR FORCES.		
General staff and regimental		
pay, allowances, and charges	£5,313,800	o sa deligi
Commissariat establishment, services, &c. &c	1,185,600	
vices, and supplies	460,800	
Barrack establishments	512,900	
Divine service	43,800	
Administration of martial law	2,000	3.70 000 000
Hospital establishment	366,800	100
•		£7,885,700
II.—RESERVE FORCES.		
Militia and inspection of re-		The state of the state of
Berve	952,700	
Yeomanry cavalry	89,300	2.5
Volunteer corps	414,000	
Army Reserve force	81,200	10 May 1 44
	<del></del>	1,537,200
III.—STORES.	1,1	
Military store departments		1,150,000
IVWorks and Buildings.		
Expenditure on works at		884,000
V.—VARIOUS SERVICES.		
Establishments for military		
education	158,200	
Survey of the United Kingdom	118,500	
Miscellaneous services	90,600	
Administration of the srmy	223,400	
	<del></del>	590,700
Total effective se	rvices	£12,047,600
VINon-effective Service:	s.	
Rewards for distinguished ser-		100
	27,000	
Pay of general officers	73,000	
Tall non of reduced and va-	1000	
Full pay of reduced and re- tired officers, and half-pay	490 500	
med oncers, and nam-pay	480,500	
Widows' pensions, &c	156,400 22,300	
Pensions for wounds	22,300	
	9.1.400	20
pitals	34,400	
Out pensions	1,239,300	
Superannuation allowances	132,000	
Militia, yeomanry, and volun-	37 000	
teers	17,900	9 109 9//0
	<del></del>	2,182,800
Total		£14,230,400

ARMY-WORKS CORPS .- A suggestion was n 1854, during the Crimean war, that a number of skilled labourers, such as railway navigators, miners, and the instruction of the Royal Engineers, &c., in military field-works, sapping, mining, poutconing, &c., and the schools of musketry at Hythe and Fleetwood.

ARMY RETIMATES are estimates which are prepared in the spring of each year by the War Office, of the purpose of assisting the British army which was obliged to winter outside Sebastopol. There was no proper road between the harbour of Blackava and the probable expenses of everything connected with the tion of these, the Secretary of State for War applies to the railway between the two places first suggested the tion of these, the Secretary of State for War applies to the heads of the various departments under him for the heads of the various departments under him for raised and organized the first body of men who went estimates of their probable requirements, and these others, should be enlisted, and formed into a corps for the purpose of assisting the British army which was obliged to winter outside Sebastopol. There was no proper road between the harbour of Balaclaya and the

men; but Lord Raglan soon perceived the value of their services, and wrote home for reinforcements. At the close of 1855 the Army-works Corps comprised 3,500 men. No drilling nor tedious instructions were necessary to teach these men their duty. They entered upon their work fully acquainted with it; and the orperiment was altogether useful and satisfactory, as showing how an army in action can be materially assisted by ordinary workmen.

Arms grant (Res Ards), an inhabitant of the high-

ARNEE, ar-ne (Bos Arde), an inhabitant of the high-lands of Hindostan, and closely allied to the common manus on rinduction, and closely affect to the common wild buffalo. It is remarkable for strength and courage, qualities admirably seconded by a pair of horns measuring from four to six feet in length, and arching in the form of a bold erescent. In Bengal this animal is known as Arris.

ARRICA, ar'.ni.-kä, in Bot., a gen. of plants belonging to the nat. ord. Composita. The most important spe-cies is A. montana, known by the names of Mountain-tobacco, and German Leopard-bane. It is a perennial tobacco, and German Leopard-bane. It is a perennial herbaccous plaut, found growing in the meadows of the cooler parts of Europe, and also of the western states of North America. The florets are of a yellow colour, tinged with brown. The whole plant, when fresh, possesses a strong and disagreeable odour and an aorid, bitter taste. strong and disagreeable odour and an aorid, bitter taste.
All parts of the plant have striking medicinal properties, but the flowers constitute the part generally preferred. The preparation known as tincture of Arnica, which is obtained by macerating the flowers with alcohol, is now largely employed by the public as an external application for bruises; and notwithstanding the contempt with which its powers have been spoken of by eminent members of the medical profession, it has gradually gained ground among practitioners, and will probably be included with other novelties in the revised Pharmacopeia. The flowers, though not much used internally in this country, have been occasionally employed as a substitute for Peruvian bark, and are said to have proved beneficial in cases of amaurosis and chronic rheumatism. Preparations of arnica are much used by the homeopathists.

AROMA, a-ro-ma (Gr., pleasant perfume), the principle in plants or other substances which constitutes their fragrance. In some plants this resides in a vola-tile oil; but in others the portion containing this prin-ciple cannot be detected. It is of an extremely subtle ciple cannot be detected. ciple cannot be detected. It is of an extremely subtle nature, filling the air of rooms, or even the whole atmosphere around gardens; and, although constantly being imparted for years, -as it may be, for instance, in the case of the musk, so as perpetually to fill the air of a well-ventilated room,—yet never causing to the substance from which it emanates any diminution of The aroma of plants is imparted to oils and

spirits by maceration.

AROMATICS, & ro-mat'-iks, substances, as plants, drugs, and medicines, which emit agreeable odonrs, and are usually characterized by a warm pungent taste. and are usually engracterized by a warm pungent taste. Such are the spices ginger, cinuamon, pepper, balsams, frankincense, &c. They generally contain a peculiar volatile oil, mixed with resinous substances. The animal kingdom furnishes some aromatics, as ambergris, musk, civet, &c. They are employed in the manufacture of perfumery, and in medicine as antispasmodies, &c.

AROMATIC VINEGAR, a very popular perfume, the base of which is acetic acid. One of the best recipes for it is

Concentrated acetic acid ... Otto of English lavender ... 2 drachms. 1 drachm. cloves ... ... ...

1 oz.

camphor

The bruised camphor to be first dissolved in the acetic and the perfuses are then added. After being allowed to stand during a few days, with occasional agitation, the compound is to be strained, after which it is ready for use. The most popular of the aromatic production of the aromatic popular of the aromatic production of the aromatic production. ready for use. The most popular of the aromatic vinegars is that of Dr. Henry, the recipe for which is so follows:—Dried leaves of rosemary, rue, wormwood, sage, mint, and lavender-flowers, each \$\dot\ oz.; bruised nutmeg, cloves, angelica-root, and camphor, each \$\dot\ oz.; concentrated acetic acid, 16 oz. The materials to be macerated for a day in the cloth of the acid the acid that the said than to be added allowing the whole

similar kind, The Art of Perfumery, by G. W. S.

ARROGIO, ar-pedi'-e-o (Ital, from arpa, hsrp), in Mus., signifies reiterated successions of the several notes which compose any chord. The violoncello, viola, violin, and all instruments played upon with a bow, are all the compositions of the several properties of the composition of the compositio are capable of performing an arpeggio; but it is to the harpsichord and pianoforte that its execution more particularly appertains.

ARPENT, or ARPENS ar'-pain(g) (Fr. arpent), an acre or furlong of ground. According to Domesday-book, 100 perches make an arpent. Some account it but half an acre. The old French arpent contained 100 perches,

of 18, 20, or 22 French feet each.

ARQUEBUS, or HARQUEBUS, ar'-kws-bus (Ital. archi-buso, iron bow), was a kind of hand-gun used before the invention of the musket. The carliest hand-guns were fired by applying a match with the hand to the souch-hole. Afterwards a contrivance, suggested by the trigger of the crossbow, was introduced, by means of which the burning match could be instantaneously applied. This was called an aquebus, and is first men-tioned by Philir, de Comince, in his account of the tioned by Philip de Comines, in his account of the battle of Morat, in 1476. On the formation of the Yeomen of the Guard, in 1485, many of them were armed with arquebuses.

ABRACACHA, arra-ka'-ka, in Bot., a gen. of plants belonging to the nat. ord. Umbellifera. It includes one species of great importance, namely, A. esculenta, a plant much a plant much cultivated in the tropical regions of South America for the sake of the root, which is a very valuable article of food. This is about the size of a parsnip, which it somewhat resembles in flavour. It has been recommended as a substitute for the potato, and attempts have been made to cultivate it in Britain, but without any very satisfactory results. The starch obtained by rasping and washing the root is similar to

arrowroot.

ARRACK, ""r"r"k, the name given in eastern countries to any kind of ardent spirit, but which is generally tries to any kind of ardent spirit, but which is generally understood to apply to a spirit made either from rice, or from the juice of a palm-tree. (See Rice, Toddy.) Arrationem Arration-ment (Lat. ad rationem powers; Crd Fr. ad reson, or, abbreviated, a reson, to call to account or answer), in Law, is the calling of the offender to the bar of the court to answer the matter charged upon him. In felonies it is absolutely necessary that the prisoner should attend his trial personally, though it is not so in misdemeanours. The indictment must be read to him distinctly in English although he has had a cony delivered to in English, although he has had a copy delivered to him. He is then called upon to plead "Guilty" or "Not Guilty." If he refuse to plead, the court may order a plea of not guilty to be recorded. (See

ABBEST, ar-rest (Lat. arrestum; Fr. arreter, to stop or stay), it. Law, is the beginning of imprisonment, where a man is first taken and restrained of his liberty by power of the law, with or without the process of some court or legal functionary. Arrests are either in civil or criminal cases, with this difference, that none shall be arrested for any cause of action, suit, or other civil matter, but by virtue of a precept or commandment out of some court; but for treason, felony, or breach out of some court; but for treason, felony, or breach of the peace, every man has authority to arrest without warrant or precept. For contempt of a superior court, the person may be attached or given into the custody of an officer of the court, until the contempt be purged by compliance, or the offended dignity of the court be appeased or satisfied with the punishment undergone. A ciergyman cannot be arrested (except in a criminal matter) in the church or churchyard while attendant there, or in going to or returning from the same for the purpose of Divine worship; and it is a misdemeanour in the party arresting, if he knew the clergyman was on his way to perform Divine service. Barristers, attorneys, and witnesses are privileged from arrest in going to, staying at, and returning from a court or an arbitration in a cause or matter in which they are actually engaged. Peers, by virtue of their numer, cloves, angelica-root, and camphor, each 10z.; described alcohol, 4 oz.; concentrated acetic acid algority, are exempt from arrest in civil cases at all times; and members of the House of Commons are spirit; the acid then to be added, allowing the whole forty days after every prorogation, and forty days to digest during a week. Ref. for several recipes of a before the next appointed meeting. Arrest in all civil cases before judgment is abolished, except the plaintiff can by affidavit show to a judge of a superior court or of a county court, a reasonable presumption for believing that the defendant means to go abroad shortly, believing that the defendant means to go abroad shortly, and to reside abroad; in which case he will grant leave for his arrest by writ of capies, directed to the sheriff. The claim must, however, be £20 or upwards. An action will lie for a malicious arrest. No person can be arrested in a civil case on Sunday. (See Lyquest, Judgment.) Arrest of Judgment.—For defects in substance, appearing plainly upon the face of the record, not amendable nor cured by verdict, the court will in general arrest the judgment. After argument on demarrer, the party cannot move in arrest of iudgment

general arrest the judgment. After argument on de-murrer, the party cannot move in arrest of judgment for any defect or objection of which he might have availed himself on the argument of the demurrer. The motion in arrest of judgment must be made after the exparation of four days from the time of trial, if there are so many days in term; but it cannot be made after the expiration of the term. Defects may be amended. (See Judgment non obstants Verbiller).

ARRONDISSEMENT, ar-rond'-is-mawn(g) (Fr.), a term employed in France to distinguish any portion of and held under the control of civil, military, or ecclesiastical authority. France is divided into departsantical authority. France is divided into departments, which are subdivided into arrondissements, and named accordingly; as the arrondissement of the Justice of Peace, the Maritime Arrondissement, &c. Paris is divided into twelve arrondissements, or mairies, equivalent to the wards of the city of London.

ARROW. (See ARCHERY.)

ARROWHEAD. (See SAGITTARIA.) ARROWHEADED CHARACTERS.

(See CUNBIFORM

Inscriptions.)

Arrowsoot, ar-ro-root, the name given to various kinds of starch used as food by man. True West Indian arrowsoot is obtained from rhizomes or root-stocks of the plant Maranta orundinacea, and is one of the purest and best-known of the amylaceous substances. It forms avery firm jelly with boiling water, and, thus prepared, is a common article of diet for invalids and children. The name arrowroot is derived from the fact of the bruised rhizomes of the plant being employed by the native Indians as an application to the poisoned wounds inflicted by arrows. East-Indian arrowroot is obtained



ARROWROOF PLANT (Maranta arundinacea).

from the rhizomes of angustifolia. Curcuma and is sometimes called cureuma starch. West-Indian plant is, however, cultivated to some extent in the East, and supplies of the true arrowroot are brought from Singapore. Tahitained from the plant named Tacca oceanica, and the substance called Portland arrowroot is extracted the from Arum maculatum, a common hedgeweed in this country. In an inco-cases, the fecula concases, the fecunicists of starch-grains, sists

which are produced in great quantity, before the season of rest, in the succulent rhizomes or root-stocks of the plants. These grains are separated from the cellular risanc, and often acrid juices, by a very simple process, which consists simply in washing the grated root-stocks. Arrowroot is frequently adulterated with potato-starch and refined sugo-flour, sometimes with rice-starch, and the starch of common wheaten flour. The granules of these inferior starches can readily be distinguished under the microscope by their different forms and sizes. (See STARCH.)

ARSENAL, ar'-se-nal (Lat. arx, arcis, a citadel), is applied generally to any place where naval or military applied generally to any piace where naval or military stores are kept, more particularly to a large public establishment where the munitions of war are manu-factured and stored. The great Erglish arsenals are Woolwich, Portsmouth, Plymonth, Deptford, Sheer-ness, and Pembroke. In France, the principal are Cherbourg, Brest, and Toulon.

ARSENIO, ars'-nik (Gr. arsenikus).—The substance which, in commerce, goes by this name, is the oxide of the metal arsenic, or arsenious acid. Arsenic was known in different combinations by the ancients, but has only lately been shown to be of metallic origin. It is, however, so unlike a metal in many of its properties, that certain French chemists consider it as belonging that certain French chemists consider it as belonging to the non-metallic elements. It conducts electricity, and possesses metallic lustre, and is very much allied to phosphorus. Arsenic is prepared in the state of arsenic acid or oxide, by roasting the arsenical sulphide of iron. Metallic arsenic possesses a brilliant grey-lustre, which is unmistakably metallic. It may be reduced to powder in a mortar. When heated in close vessels, it sublimes unaltered; but in a current of air, it absorbs oxygen, and burns with a bluish flame, depositing a white mealy powder. A minute quantity of arsenic is added to lead, to diminish its cohesion, during the manufacture of shot. The only important combinations of arsenic are,—arsenicus acid, AsO<sub>3</sub>, the white arsenic of the shops; arsenite of AsO<sub>3</sub>, the white arsenic of the shops; arsenite of copper, or Scheele's green, a poisonous pigment which ought to be legally prohibited; the Schweinfurth green, ought to be legally prohibited; the Schweinfurth green, which is a double acetate of arsenic and copper; the bisubphide, or realgar, which is used in pyrotechny; and the tersubphide, or orpiment, which is the king's yellow of the artist. Arsenic also forms a terhydride with hydrogen, analogous to the ammonia-like compounds formed by antimony and phosphorus. (For testing for arsenic, see TESTS.) Arsenic forms the connecting link between the non-metallic elements and antimony, which is certainly only a little more metallic than itself. In cases of poisoning by arsenic, freshly-precipitated hydrated oxide of iron, or calcined magnesia, should be at once administered. The inmagnesia, should be at once administered. The influence of a minute quantity of arsenic on the human frame is a very curious question. In Styria, it is a common thing for the peasants to take twelve or thirteen grains per day of white arsenie, to improve their wind. It appears to do them no harm, as long as they relinquish the use of it gradually when they reach 50 or 60 years of age. They begin by taking a single grain per day, increasing the dose until they arrive at their maxing. If the doses are discontinued suddenly. maximum. If the doses are discontinued suddenly, death, with all the symptoms of arsenical poisoning, is

the result. Arson, ar'-son (Lat. ardeo, I burn), at Common Law, is the maliciously, voluntarily, and actually burning the house or outhouse of another man, or wilfully setting fire to one's own house, provided one's neighbour's house is thereby also burnt; and all, not only the bare dwelling-house, but all outhouses that are parcel thereof, though not contiguous thereto, nor under the same roof, as barns and stables, may be the subject of arson. The statute law has made the malicious or wilful setting fire to almost every description of

crous or winth setting the to almost every description of building or property subject to the same punishment as attached to the crime of arson.—See statute 24 & 25 Vict. c. 97, ss. 1 to 10.

ART, art (Lat. are), as distinguished from Science, consists of the truths disclosed by that species of knowledge disposed in the most convenient order for remaining instead of the heat cate for thought. Asset snowing g disposed in the most convenient order for practice, instead of the best order for thought. Art proposes to itself a given end, and, after defining it, hands it over to Science. Science, after investigating the causes and conditions of this end, returns it to Art, with a theorem of the combination of circumstances under which the end desired may be effected. After receiving them, Art inquires whether any or all of those scientific combinations are within the compass of human power and human means, and pronounces the end inquired after attainable or not. It will be obend inquired after attainable or not. It will be observed here, that all that Art supplies is the major premiss, or the assertion that the given aim is one to be desired. The grounds of every rule of Art are to be found in the theorems of Science. An Art can then only consist of rules, together with as much of the speculative propositions (which lose all their speculative look as soon as they come into the artist's hands) as comprises the instillection of these rules. hands) as comprises the justification of those rules. Though Art must assume the same general laws as Science does, yet it follows them only into such of their detailed consequences as have led to certain practical rules, and pries into every secret corner, as well as into the open stores of the household of

### Art and Part

Science, bent on finding out the necessities of which she is in search, and which the exigencies of human life demand. Hence, as Edmund Burke wisely remarks, in his treatise on the Sublime and Beautiful, "Art can never give the rules that make au art." It must always owe them to Science. Whatever speaks in precepts or rules, as contrasted with assertions regarding facts, is Art; and hence it always adopts the imperative mood, whereas Science nearly always adopts the indicative. Science is wholly occupied with declathe mucative. Science is wholly occupied with occu-rations, while Art is wholly engaged with injunctions, that something should be done. Thus, the builder's art desires to have houses, the architect's art desires to have them beautiful, and the medical art desires to cure diseases in the human body.—For further information on this subject, see Mill's Logic, vol. ii. c. xi.; and Dr. Brown's Hore Subsective.

ART AND PART (Lat. ars, cunning, invention; pars, a party in), in Law, is a term used in Scotland and the north of England, when one charged with a crime; committing the same was both a contriver of and

acted his part in it.

ARTANTIE, ar-ion-the, in Bot., a gen. of plants belonging to the nat. ord. Piperacea. The species are natives of the tropical regions of America. The dried leaves of A. elongata regions of America. The dried leaves of A. elongata are much used in medicine. (See MATICO.) The dried fruits of A. adunca are employed as a substitute for pepper. The spikes of fruit of A. crocata are used for dycing yellow.

ATTENISTA, ur-te-mist-i-ii (from Artemis, one of the perpendiction of the perpendiction) in Both according to the perpendiction of the perpendiction.

names of the goddess Diana), in Bot., a gen. of plants belonging to the nat. ord. Compositæ, and comprehending several interesting and valuable species. A. Absinthium, the common wormwood, is an indigenous perennial, often met with in waste places and by roudsides. The flowers are arranged in globular heads, and are of a buff or yellowish colour, blossoming in August. The principal constituents are a volatile oil, a bitter principle called absinthin, and carbonate of potash. The latter was formerly known as "salt of wormwood;" but it possesses no specific virtue other than belongs to carbonate of potash generally : it is still, however, regarded as a patent remedial agent by the agnorant. The dried herb, or flowering-top, under the pame of wormwood, is used as an aromatic bitter tonic, and as an anthelmintic. It is also employed in the preparation of liquetrs. The species A. Abrotanum is the southernwood, a fragrant plant employed on the Continent in making beer. The Persian species A. acetica is said to have the odour of strong vinegar; hence its name. The species A. alba and others are said to serve as nourishment to the herds of the Kirghese and Calmucs. The anthclmintic known by the names Semen-scriphii and Barbotine consists of the flower-Semich-serrom and Darroome consists of the Roma-heads of A. carulescens, a Mediterranean plant. A. chinensis, and other species, are stated by Lindley to yield the Moxa of China. It is prepared from the cottony or woolly covering of the leaves, and used as a cautery, by burning it upon parts affected with gout and rheumatism. (See MOXA.) A. Draenweuler is the tarragon, the leaves of which are used for flavouring vinegar in pickles and salads. A. gallica, termed in France sanguerie or sanguerite, possesses similar properties to the species carulescens. A. indica and madraspatuna, both Indian species, are much used by madruspalana, both Indian species, are much used by the native doctors. A. mutellina and spicata, both Alpiue plants, are said to furnish between them the famous inquor called oreme d'absinthe, which a modern French writer styles "the emerald poison." The substance sold as wormsced, and known under the names of semen-contra, semen-cine, and semen-santo-nicum, consists of the broken flower-stalks, involucres,

nicum; consists of the broken flower-stalks, involuces, and flower-buds of A. contra., paucifora, lercheana, sieberi, and toliuna. It is employed as a vermifuge.

AREKRIOTOMY, ar-te'-ri-o''-o-me (Gr. arteriu, an artery, and temno, I cut), in Surg., is the term applied to the opening of an artery for the purpose of drawing blond, and is distinguished from phlebotomy, or venescation, which is the opening of a vein. In ordinary cases, the latter is always preferable to the former; not sometimes, when it is necessary to take a large quantity of blood from the system very rapidly, as in aborolley, arteriotomy is adopted, and then it is geneapoplexy, arteriotomy is adopted, and then it is generally the temporal artery that is selected.

Autuny, ar'-te-re (Gr. aer, air, and tereo, I keep),

## Artesian Well

is literally an air-duot, and was a name applied by the ancients to certain vessels of the human body, which were believed by them to contain air, from their being were believed by them, to contain an, from the return dening found empty after death. The arteries are those vessels which convey the blood from the heart to all parts of the system. They are membraneous cylindrical tubes, composed of three coats; viz., the external, which is firm, strong, and elastic; the middle, which is firm, attrong, and elastic; the middle, which is muscular, contractile, and brittle; and the internal, which is brittle, smooth, and transparent, and lined with epithelium on the side washed by the blood. The action of the arteries called the pulse corresponds with that of the heart, and is effected by the contraction of their muscular coat and the great elasticity of their outermost one. Besides the arteries which carry the purified blood from the heart to all parts of the body, there is the pulmonary artery, which emerges from the right ventricle of the heart, and carries the impure blood from the heart to the lungs. The other arteries all spring from the aorts. (See Anaromy.) The principal arteries will be found noticed under their respective names.

respective names.

ARTESIAN WILL, ar-te'-zi-in, a well from which water is obtained at a very great depth below the surface of the ground, by boring through strata of various kinds through which water camoot pass, such as clay, to others of a light and povous character, which are charged with water. The flow of water is obtained by hydrostatic pressure. The principles of an artesian well, and the way by which the water is obtained, may be better understood by reference to the accompanying diagram, from which it will be the accompanying diagram, from which it will be presently seen that it would be useless to attempt to bore an artesian well on hills or elevated ground; but that they can only be made with satisfactory results in basin-shaped hollows of considerable extent, the porous strata of which, that contain the water, crop out or come to the surface of the land above the level to which the water is required to rise. Let the figure represent the section of a basin-shaped tract of country, such as the London or Paris basin, and suppose au to be a stratum of clay through which water cannot make its way; bb, an underlying stratum of light



ARTESIAN WELL

sandy formation, or porous chalk-beds, which will contain water; and cc, another stratum impervious to water, like aa. Now all the rain which fails on the surface of the porous stratum at bb, and on all ground above it in elevation, and sloping towards it, from which, if impermeable to water, the rain will trickle down to the porous stratum, will be absorbed by it and held in the same, as the clay stratum as prevents the rising of any springs to the surface of the ground between the points aa, and the stratum cc, of a similar character, prevents the water from oozing away below. In a basin such as that described above, some miles in extent, having impermeable strats lying immediately under the thin surface of the soil, there must necessarily be a deficiency in the supply of water, and it is for these districts that artesian wells are especially serviceable; for if a hole be bored from d to e, the pressure of the water in the parts of the porous tratum bf, bf, above the level ff, will cause the water accumulated below that level to rush through the bore in considerable quantities, and rise to some height above the level gg, the level of the ground at the mouth of the well. Artesian wells are said to derive their name the well. Artesian wells are said to derive their name from the province of Artois, in France, water having been obtained there from wells of this kind from a very early date. There are many in the neigh-bourhood of Vierns, and in the basins of London and Paris; among which may be mentioned those which supply the fountains in Trafalgar Square, and the famous well of Greuelle, near Paris, from which, after boring for eight years, with frequent interruptions arising from the obstructions and accidents that occurred during the prosecution of the work, water was obtained at the depth of 1,800 feet below the surface, a distance of 1,700 feet below the sea-level. The water from this well rushes upwards with such force as to rise 30 feet above the level of the surface, and it is said to have risen at first to four times that height. The temperature of this water never varies, and is about 81° Fahrenheit, or a little more. The French government have caused many artesian wells to be such in different parts of Algeria, round which some of the wandering Arab tribes have settled, and formed villages. The operation is performed by rods from 15 to 20 feet in length, which can be attached to each other by male and female screws. A borifg-tool is fasteneds to the end of the lowest rod, and, to the uppermost one, a lever turned by hand, by which the whole machine is turned round. The machine somewhat resembles a gigantic anger or gimlet, and operates in a similar manner.

ARTHRON, arth-ron, is a Greek word signifying a joint, and, in composition, is used in a number of medical terms; as, arthrosis, an articulation; arthritis, inflammation of a joint, the gout; arthrodynia, pain in a joint; arthroposis, a collection of pus in a joint; arthrodosis, a collection of pus in a joint; arthrodosis, a received into the superficial cavity of another, so as to admit of motion in every direction.

ARTHEODIC, ar-throf-dik (Gr. arthrosis, articulation), in Anat, a term applied to a connection of bones, in which the head of one fits into a shallow cavity in another; by which means motion in nearly every direction is admitted of; as, for example, in the joint between the humerus and the scapula.

ARTHRODIEE, ar-thro-di-se (Gr. arthron, a joint), a term applied to such algae as possess an articulated structure, like Conferva and Oscillatorias.

ARTICHOKE, ar'-ti-choke (Fr. artichaut).—This delicate esculent is the young succellent receptace of the flower-head of Cynara Scolymus, a perennial plant growing wild in the south of Europe, and extensively cultivated in this country. On the continent the artichoke is frequently eaten raw, with salt, pepper, and oil; but in England it is generally boiled before it is sent to the table. (See CYNARA) The esculent tubers of a species of sunflower, Helianthus tuberosam, are known as Jerusalem artichokes; the term Jerusalem being a corruption of the Italian girasole, 'sunflower.' (See ILELIANTIUS.)

Articus, art-ti-kl, in Gram., is a part of speech prefixed to substantives in order to render their meaning more or less defluite. It is derived from the Latin articulas, or Greek arthron, signifying a joint, a term applied by the Greek grammarians to the definite particle, as well as the relative pronoun, as connecting together the parts of a sentence; as in 'I gave you that (or the) book that you asked for; 'the former they called the prepositive article, the latter the postice. The Greek's had only the definite article; the Latins had none, but used, instead, the demonstrative pronouns. In English there are two articles,—the definite the, and the indefinite a or an.

ARTICLE, in Law, signifies a complaint exhibited in the ecclesiastical court by way of libel or declaration. ARTICLES OF THE PRICE are a complaint exhibited

in the courts at Westminster, in order to compel the defendant to find sureties of the peace.

ARTICLES OF THE NAVY are rules and orders made for the government of the royal fleet.

ARTOLES OF WAR are certain regulations incorporated in the annual Mutiny Act, for the government of the military forces of the country, it being considered requisite for the maintenance of exact discipline, that solders who shall mutiny, or stir up sedition, or shall desert her majesty's service, or be guilty of any of the other offences specified in the act, should be brought to more exemplary and speedy punishment than the usual forms of law will allow. For the enforcement of such articles of war, power is given to the crown to convene, or to grant authority to convene, courts-martial, with power to try and punish such offences according to the provisions of the act. There are smilar articles of war issued for the government of the marines and navy; but those applicable to the latter are not included in the annual Mutiny Act.

AUTICLES, THE SIX, in the ecclesiastical history of England, were certain articles of faith imposed by accompany (See ANGLO-CATHOLIC CHURCH)

Caveon.)
ARTICLES, THE THIRTY-NINE, are the articles of religion of the Church of England, agreed upon by the archbishops and bishops of both provinces, and the whole clergy, in the convocation held at London in the year 1562, for the avoiding of diversities of opinions, and for the establishing of consent touching true religion. The substance of these articles was first promulgated in the reign of Edward VI., and formed forty-two in number. Under Henry VIII. as committee had been appointed for the formation of ecclesiastical laws, which was renewed under his successor. It was composed of Crammer, Ridley, and others, who drew up the forty-two articles above referred to, who drew up the forty-two articles above referred to and which were issued by the king's authority in 1553. On the accession of Elizabeth, Parker, archbishop of Canterbury, remodelled these articles, rejecting four of them entirely, and introducing four new ones, and more or less altering seventeen others. The four new ones are the fifth, twelfth, twenty-ninth, and thirtieth, as they now stand. When laid before the convocation of 1562, further alterations were made, and the thirty-ninth, fortieth, and forty-second of King Edward's were rejected. In 1571 the articles were once more revised and ratified. The following is a summary of the several articles:—1. That there is but one true God, and three Persons in the Godhead, of one substance, power, and eternity. 2. That Christ the Sontook upon him man's nature in the womb of the blessed Virgin, uniting the two natures in one person, never of them entirely, and introducing four new ones, and Virgin, uniting the two natures in one person, never to be divided; and was crucified, dead, and buried, to reconcile his Futher to us, and as a sacrifice for sin. 3. That he went down into bell. 4. That he rose again from the dead and ascended into heaven, taking with him his human body. 5. That the Holy Ghost is one in substance, majesty, and glory with the Father and the Son. 6. That the Holy Scriptures contain all things necessary to salvation. 7. That the Old Testament is not contrary to the New. 8. That the three creeds,—the Nicene, Athanasian, and the Apostles,—are to be received and believed. 9, That original sin is the fault and corruption of the nature of every man that naturally is engendered of the offspring of Adam. 10. That in consequence, man caunot, without the grace of God, do what is pleasant or acceptable the grace of God, as what is pieusant or neceptanic to God. 11. That we are accounted righteous before God only for the merit of Jesus Christ by faith, and not for our own works. 12. That good works, the fruits of faith, cannot put away sin, yet are pleusing and acceptable to God. 13. That works done before and acceptable to Got. 15. That works done before justification are not pleasing to God. 14. That works of supererogation, or voluntary works, over and above God's commandments, cannot be taught without arrogance and impiety. 15. That Christ was made like unto us in all things, except in that he was without sin, from which he alone was free. 16. That repentance is not to be denied to such as fall into ain after haptism, or after receiving the Holy Ghost. 17. That God hath from eternity decreed to deliver from curse and dam-nation those whom he hath chosen in Christ. 18. That men can only be saved through Christ; and not, as some say, by the law or sect which they profess, if they be diligent to frame their lives according to that law and the light of nature. 19. That the visible church of Christ is a congregation of faithful men, in which the pure word of God is preached, and the sacraments duly administered according to Christ's ordinance. 20. That the Church hath power to decree rites or ceremonies, and authority in controversies of faith. 21. That things ordained by general councils as necessary to saivation have no strength or authority, unless it may be declared that they be taken out of Holy Scripture. 22. That the Romish doctrines of purgatory, pardons, the worshipping and adoration of images or relies, and the invocation of saints, have no warranty in Scripture, but are rather repugnant to it. 23. That those only can lawfully take upon them the office of public preaching, or ministering the sacraments, who are chosen and called to this work by men having public authority in the congregation so to do. 24. That it is repugnant to the word of God and the custom of the primitive church, to have public prayer,

or to minister the sacraments, in a tongue not understood by the people. 25. That the sacraments are not mere badges or tokens of profession, but rather witnesses and signs of grace and God's goodwill towards us, by which he, working invisibly in us, not only to quicken, but also to strengthen and confirm our faith in him. That there are two sacraments,—baptism and the Lord's suppor; and that those five commonly called sacraments. sacraments, — viz., confirmation, penance, orders, matrimony, and extreme unction,—are not to be counted as such. 26. That the effect of Christ's ordinance is not taken away though ministered by evil but in Ohrist's; and their ministry may be used both in hearing the Word and in receiving the sacraments. 27. That baptism is not only a sign of profession, but also a sign of regeneration, or new birth, whereby they that receive it rightly are grafted into the Church, and the promise of forgiveness of sin and adoption to be sons of God, are visibly signed and sealed. 29. That the Lord's supper is not only a sign of the love that Christians ought to manifest towards each other, but Christians ought to manifest towards each other, but is rather a sacrament of our redemption by the death of Christ; and that transubstantiation is repugnant to the plain words of Scripture. 29. That the wicked, though they do carnally and visibly partake of the Lord's supper, are in nowise partakers of Christ, but rather eat and drink to their own condemnation. 30. That the cup of our Lord is not to be denied to the lay people. 31. That the one oblation of Christ is perfect redemption, propitiation, and satisfaction for all the sins of the whole world, both original and actual: and that the scriffects of masses are blaspheall the sins of the whole world, both original and actual; and that the sacrifices of masses are blasphemous fables and dangerous deceits. 32. That bishops, priests, and deasons are not forbidden to marry. 33. That an excommunicated person ought to be regarded by the faithful as a heathen and publican until he be again openly reconciled by penance and received into the Church. 34. That it is not necessary that traditional deceases he is all places like for the control of the contro tions and ceremonies be in all places alike; for every particular or national church hath authority to ordain, change, and abolish ceremonics or rites of the Church ordained only by man's authority; but that he who, through his own private judgment, doth willingly and openly break the traditions and ceremonies of the Church which are ordained and approved by common authority, and not repugnant to the word of God, ought to be openly rebuked, as he that offendeth against the common order of the Church. 35. That the second Book of Homilies doth contain a godly and wholesome doctrine, as doth the former Book of Homilies, set forth in the time of Edward VI., and are Homilies, set forth in the time of Edward VI., and are therefore to be read in churches. 36. Of consecration of bishops and ministers according to the Book of Consecration, set forth in the time of Edward VI. 37. That the queen hath the chief power in ecclesiastical as well as in civil matters. 38. That the riches and goods of Christiaus are not common; yet every man ought, according to his ability, to give liberally of his goods to the poor. 39. That though vain and rash swearing is forbidden, yet a man may swear when the magistrate requireth, so that it be done in justice, judgment, and truth. judgment, and truth.

ARTICULATA, or ARTICULATED ANIMALS, ar-lik-u-lai-tā (Las. articulatus, jointed), according to the classification of Cuvier, the third great division of the animal kingdom. The great French naturalist subdivided the Articulata into four classes, to which later writers have added four others. The first four of the following classes are those of Cuvier:—1. Annelida, as following classos are those of Cuvier:—I. Annelida, as cleeches, earthworms, &c.; 2. Crustacea, as lobsters, crabe, prawns, &c.; 3. Arachnida, as spiders, mites, secrpions, &c.; 4. Insecta, as butterflies, beetles, flies, &c.; 5. Myriopoda, as centipedes; 6. Cirrhopoda, as barnacles and sea-acorns; 7. Rottiers, wheel-shaped animalcules, aquatic; 9. Entozoa, lowest of the worms, parasites upon or within other animals. (See these words.) The Articulatu derive their names from the fact of their heing composed of segments articulated words.) The Articulata derive their names from the fact of their being composed of segments articulated or jointed together, each segment being formed of one or more rings.

ARTICULATE SOUNDS. (See LETTERS.)
ARTICULATION, ar-tik-u-lai'-shon, in Gram., is a term applied to a consonant, or that portion of a word which can be pronounced by a single movement of the

organs of speech. Hence a good articulation consists in giving every letter and syllable of a word its due pronunciation. Exactness in articulation corresponds to propriety in spelling, and is an object that ought to be aimed after by all. The Greeks and Romans paid particular attention to this subject, which constituted a principal branch of instruction; and the smallest error in pronunciation was regarded by them as disgraceful. An indistinct articulation usually arises from too great precipitancy of speech, or from an improper use of the vocal organs. The latter of these may be cured by attending to the proper position of the tongue, lips, &c., in the formation of each letter; the former

lips, &c., in the formation of each letter; the former is to be got over by continued practice in reading aloud alowly and distinctly.

ARTICULATION, in Anat., is applied to the connection of the bones of the skeleton by joints. (See Anatomy.)

ARTICULE CLERY, artik'-u-ti kle'-ri, are statutes containing certain articles relating to the church and cleryy, made in the 14th Edward III.

ARTICULE ARTICULES ARTICLES OF THE CONTROL OF THE ARTICLES OF THE CONTROL OF THE CO

clergy, made in the 14th Raward 11.

Antificen, ar-tif'-i-ser (Lat. ars, art, and facio, I make), is, literally, one who makes according to art; hence, a skilful workman, a contriver. It is frequently used, however, as synonymous with artisan or mechanic, one who practises manual labour. In this country a mechanic, after serving an apprenticeship, enters at once as a journeyman; but in Germany there intervenes a sort of transition period, during which he has to visit and practise his trade in other places. In many parts of Germany an apprentice cannot obtain his freedom and become a master until he has another a cartier number of reares in following. he has spent a certain number of years in following ne has spent a certain number of years in following his calling beyond his native country. He is furnished with a book, in which his various employers insert certificates of his service and conduct. In his wanderings he is generally assisted and succoured, not only by the trade to which he belongs, but also by the general public. While this system has its evils, it certainly tends to give to the young artisan a greater amount of varied and extensive observation than he could have obtained at home. Latterly, however, the custom has, on account of the evils to which it gives rise, been going out of use; and indeed, from the nu-merous facilities for obtaining knowledge in the present day, there is not the same necessity for it as there was when it was first instituted by the trade guilds in the Middle Ages

the Middle Ages.

ARTHICIAL HORIZON, ar-ti-field-āl (Lat. ars, art, and facers, to make; Gr. arizein, to define), a contrivance by which the altitude of a star, or any heavenly body, is taken by the aid of a sextant or reflecting circle. It is generally made in the form of a circular cop with a flat bottom, about three inches in diameter and half an inch deep, which is filled with unlikeliker on the surface of which a piece of dust is quicksilver, on the surface of which a piece of glass is placed. It is generally protected from the action of the wind by a covering of glass placed in a metal framework. The surface of the quicksilver forms a framework. The surface of the quicksilver forms a plane parallel to the rational borizon (see HORIZON) of the position of the observer, and the augular ele-vation of any object above the true horizon is the angle between the plane of the quicksilver and a line drawn to it from the object, due correction being made for refraction and parallax. To make use of this instrument, the observer must place himself in a position which will enable him to see the object the altitude of which is required and its reflection in the quicksilver at the same time. The angular distance between the object and its reflected image is then measured by means of a sextant, and this result, when corrected for the index error, must be divided by 2, since the reading obtained is double the altitude of the object, as, by the laws of reflection, the image is as much below the plane of the quicksilver as the object itself is shown it, and the contest will express the apparent. is above it; and the quotient will express the apparent altitude of the object observed. Very accurate observations can be taken on land by aid of the artifleial horizon; but it is of little service at sea, owing to the unsteady motion of the vessel.

ARTIFICIAL FLOWERS.—This manufacture has lately

herrical Lowkes.—In manulacture has lately been carried to wonderful perfection, the imitation of natural flowers being so perfect as to mislead even artists. The greatest ingenuity is displayed in the imitation of certain flowers; even a common twopenny sprig consisting of several materials well put together

and arranged. The leaves and petals are generally made of silk or cambric punched out to proper shapes and sizes. These are tinted with a brush and colour, and sizes. These are tinted with a brush and colour, and, if necessary, glazed with gum or sprinkled with fine flock, to imitate the glossy or velvety surface of natural flowers. The ribs, where present, are indented with a warm iron. The stamens and pistils are formed of wire covered with silk, and dipped in gum-water to form the anthers. The stalk is then made of wire. form the anthers. The stalk is then made of wire, coated with green paper, and fixed to the stamens and istil, around which are attached the petals, and, stly, the calyx. Buds are made of cotton or glass alls covered with cambric of a proper colour. The rench excel in this manufacture, and annually export £40,000 worth of these pretty frivolities. Above 4,000 wirls, of different ages, are engaged in London, making blue roses, crimson corn, pink ivy, and other monstrosities, only to be found in the English artificial flower-market. Worse than all, however, the colonsflower-market. Worse than all, however, the colourring matter used for these articles is often nothing less than the deadly poison arsenic. Hofmann and other chemists have shown that the most terrible effects may arise from the employment of these arsenical com-pounds; and it is to be hoped that their use will be speedily discontinued. ARTIFICIAL FUEL. (See FUEL.)

ARTIFICIAL LIMBS, &c .- Ingenious mechanical contrivances for supplying substitutes for those limbs or other organs of the body which accident or misfortune has removed; such as hands, arms, or legs. The skill of the dentist, or the unerring nicety of calculation required by the operator who fixes in an artificial eye, is rather a surgical operation than an anatomical con-trivance; but by artificial limbs is generally meant those combinations of steel framework, screws, springs, cork, leather, caoutchoue, and gutta-percha, which imitate the form, and, to some extent, the motion and practical utility of the real limb. For instance, in 1847, the son of one of Sir George Cayley's tenants lost a hand by accident. Sir George, who possessed considerable inventive talent for mechanical contriv consideration inventive taient for inconsincts contriv-ance, made him an artificial hand, the use of which lessened the severity of his privation. The stump of the boy's arm was introduced into a case or sheath, to one end of which was fixed a spiral spring, and to the other end a bent lever; the middle of the lever was connected with a mechanism of rods which moved the artificial thumb and fingers. By this arrangement the boy had to use his real hand to work his artificial one. By pressing a little button connected with the bent lever, the artificial fingers and thumb opened to receive any object that he might wish to grasp; and when the pressure from the real hand was removed, the grasp took effect without further effort till released by a contrary movement. Afterwards, as it was found inconvenient to take away the real hand from anything else that it had to perform for the purpose of directing the motion of the artificial hand, Sir George Cayley invented an ingenious method of working the mechanical limb by the movement of the shoulder and upper part of the arm.

part of the arm.

ARTHLERY, ar-til-ter-re (Fr. artiller, to fortify), in the most appropriate application of the word, means the camon, mortars, howitzers, and other large pieces for discharging shot and shell by the expansive force of inflamed gunpowder. In a more general sense, it denotes engines of war of all sorts, ancient and modern, by which durts at more shull far are about fourth in

term implies all kinds of missiles employed in warfare, with the machines used in propelling them. The estilest of these military engines were probably used for casting stones of enormous weight. In 2 Chron xxvi. 15, we read of Uzziah, that "he maile in Jerusalem engines invented by cunning men to be upon the towers and upon the bulwarks to shoot arrows and great stones withal." From the writings of Caesar, Cicero, Livy, Seneca, and Tacitus, we gather that the principal engines of artillery of the Romans were the balista, or ballista, for casting stones, and the catapulta, for propelling darts and arrows. Pliny assigns the invention of the balista to the Phoenicians, and the catapulta to the Syrians; but other writers—among them Phito the Syrians; but other writers-among them Plutarch and Diodorus—declare that both machines were taron and Diodorus—deciare that noth machines were invented in Sicily, about the same time as the battering-ram, a date not anterior to E.C. 300. Welearn from Appian, that when the consul Censorinus marched against Carthage, 2,000 engines for propelling darts and stones were surrendered to him. Engines of artillery do not seem to have been known in England earlier than the invasion of the Normans; but the latter appear to have introduced such machines, in the form of contrivances for propelling arrows, at the battle of Hastings. Soon afterwards, inventions for assaulting and defending places became greatly multiplied; and, if the statements of the middle-age chrolings are statements. niclers may be credited, many of these engines posnevers may be credited, many of these engines pos-sessed enormous powers. According to Hemingford, Edward I. employed engines at the siege of the castle of Stirling in 1303, throwing stones of 300 lbs. in weight, Although it can be shown that the explosive force of gunpowder was understood in the East much earlier than the 12th century, the date of its being known to Roger Bacon, yet it was not until long afterwards that firearms superseded the ancient engines of war we have hitherto included as artillery. Colonel Chesney, in his "Observations on Firearms," thus traces the introduction of the new form of artillery into Europe: introduction of the new form of artillery into Europe; —
The Moors, according to Condó, used artillery against
Saragossa in 1118, and, in 1132, a culverin of 4 lbs,
calibre, named Salamonics, was made. In 1157, when
the Spaniards took Niebla, the Moors defended themselves by machines which threw darts and stones by
means of fire; and, in 1157, Abdalmumen, the Moorish
king, captured Mohadin, a fortified city near Bona,
from the Sicilians, by the fame means. In 1280 artillery was used against Cordova, and, in 1306 or 1306,
Ferdinand IV. took Gibraltar from the Moors by means
of artillery. Ibn Nassan ben Bin, of Granada, menof artillery. Ibn Nassau ben Bin, of Granada, monof artifery. Ibn Nassau ben Bin, of Granada, mon-tions that guns were adopted from the Moors, and were used in Spain in the 12th century, and that balls of iron were thrown by means of fire in 1331. Barbour, in his "Metrical Life of Robort Bruce," says that cannon, or "crakys of war," as he terms them, were employed by Edward III. in his earliest campaign against the Scots in 1327. Du Cange asserts that cannon were used by the French at the siege of Puy Guillaume, in 1338; but Rupin, on the other hand, relates, that so unacquainted were the French with these engines of destruction, that four small cannon used by Edward III. at the battle of Cressy, in 1346, contributed, as much by the surprise as the slaughter they created, to the success of the day. The carliest cannon were clumsy and ill-contrived machines, wider at the mouth than at the chamber, and consisting generally of a series of iron bars soldered together lengthwise, and hooped about with iron rings. The projectiles were made of stone. Cannon were first denotes engines of war of all sorts, ancient and modern, by which darts, stones, bullets, &c., were shot forth in battle. (See Cannon, Gurk, Morlar, Ordendard). In the English service, the term signifies the guns and their equipment, the troops serving them, the scientific principles of their construction and employment. Artillery is divided into land artillery and marine artillery. The former is subdivided into field, coast, garrison, and siege artillery. Field artillery accompanies cavalry and infantry, or srue any field-works that may be thrown up; coast, garrison, and siege artillery consist of the heaviest guns that can be brought to bear in each particular case. The term artillery has, since the invention of gunpowder, been restricted to such large ordinance as cannons, howitzers, mortars, and reckets, but including also the restricted to such large ordinance as cannons, howitzers, mortars, and reckets, but including also the weight of the hall they propel. Thus according to the weight of the hall they propel. Thus arons and reckets, but including also the weight of the hall they propel. Thus arons are named at 12-pounder; one that propels a ball of 32 lbs. a 32-troops required for their working, the carriages, ambient of the supplied of the hall they propel. Thus arons are named at 12-pounder; one that propels a ball of 32 lbs. a 32-troops required for their working, the carriages, ambient of the present day, cannon are named at 12-pounder; one that propels a ball of 32 lbs. a 32-troops required for their working, the carriages, ambient of the supplied of the hall they propel.

## **Artillery Company**

VIII., in 1435. The howitzer, an improved form of mortar, was invented by Belidor, and first used at the siege of Ath in 1697. The carronade, the invention of General Robert Medville, was first used about 1779. They take their name from having been first cast at the Carron iron-works. Iron rockets, or, as they are now termed, Congreve, and were employed at the bombardment of Copenhagen. (For an account of the most important of the modern engines of war which come under the head artillery, see ARMSTRONG GUN, WHITWORTH GUN, LANCASTER GUN, &c. For the theory of artillery, see Gunnery. For a description of the various cannon employed in the English and some of the foreign armies, see Ordnance. For a description of the present mode of casting cannon, see CANNON.)

ABPILLERY COMPANY, THE HONOUGABLE, of the city of London, originated about the year 1585, when a number of the citizens, during the fear of a Spanish invasion, voluntarily formed themselves into a company for the defence of the city. When the panic subsided, the company fell into decay; but, in 1611, it was revived by warrant from the privy council, and the about free it myshered 600 volunters. In 1600 in a short time it numbered 6,000 volunteers. In 1640

in a short fine it numbered 6,000 vofunteers. In 1840 the company was presented by the corporation of the City with a piece of ground, near Moorfields, for military exercise. The members are elected by ballot, and pay an annual subscription of one guines to the funds of the company. They protected the Bank of England during the "Gordon riots" in 1780.

ARITLERE PARK is the place in a camp, or the rear of an army, where the artillery is placed. The artillery is drawn up in lines, one of which is formed by the guns, the others by the ammunition-waggons, pontoons, &c.; and the whole is usually surrounded by ropes. This name is also applied to the whole guns, waggons, ummunition, &c., necessary for siege or field waggons, ummunition, &c., necessary for siege or field operations.

ARTILLERY TRAIN, a number of pieces of ordnance mounted on carriages, with all their furniture ready

for marching.
ARTIST, ar'-tist (Fr. artiste), one who is skilled in the exercise of any art, such as painting, sculpture, music, &c.; the professor of any liberal or mechanical art. The term is especially applied to those was follow painting as a profession. In early times, the expression was used to denote a proficient in the seven liberal arts which formed the complete course of study at the universities; namely, grammar, logic, Thetoric, arithmetic, music, geometry, and astronomy.

By Paracelsus it is used to signify a chemist, or rather alchemist. At Vicenza, an old custom existed of allowing any skilful artificer, convicted of a capital offence for the first time, to save his life if he could show himself to be a workman of consummate skill in the exercise of his craft or calling.

ARTOCABPACER, ar'-to-kar-pai'-se-e (Gr. artos, bread, karpos, fruit), in Bot. a nat. ord. of dicotyledonous plants, consisting of 30 genera and about 60 species,prairies, consisting of the general and regions, baring a milky juice, which contains caoutchous, or Indiarubber, dense heads of unisexual flowers, and, generally, fruits of the corosis form. The typical genus, Artocarpus, or Bread-fruit, includes two very important food-producing trees, namely, A. incieu and A. integrifolia. The first species is a native of the Molucas and islands of the Pacific: it yields, the nutritious bread-fruit which supplies the place of corn to the natives of the regions in which it flourishes. This fruit is green, and of the size of a large melon. Several varieties are known, the best being that which is free from all spines on the surface. The nuts found inside the fruit are roasted and eaten; but these are not so highly valued as the fleshy receptacle, which forms the broad of the South-Sea Islanders. When roasted, this becomes soft, tender, and white, resembling the cramb of a loaf; it must, however, be eaten new, as, by lessing, it becomes hard and choky. The bread-fruit tree was introduced by the British government into the West Indies, where it is still enlivated; whence it has been carried to the American continent. The species A. integrifolia yields the Jak, or Jack-fruit, decorated, to illustrate ornamental act; and there is an excellent library in connection with the institution, parts of the East. This is very prickly, and weighs

## Arts, Manufacturing

from 60 to 70 lbs. It has a rather offensive odeur, and is little relished by Europeans; the nets, however, when roasted, are generally liked. The inner wood of the tree is used to dye the robes of the Buddhist priests yellow. The bread-fruit and jack-fruit are good examples of the sorosis, and each affords an instance of a fruit which grows most freely, and becomes best adapted for food if proportion to the absence of seeds. (See Sonosis.) The nat. ord. Attocarpuces includes other interesting genera, which are noticed under the botanical names. (See ANTIARIS, BROSIMUM, PRYTOCREME.) TOCKENE.

ARTS, DEGREES IN. (See DEGREES.) ARTS, FINE. (See FINE ARTS.)

ARTS, MANUFACTURING.—This term is employed to distinguish a certain class of manufactures of a scientific and ingenious nature, from others which only require manual skill and dexterity. The line of de-marcation between the fine arts and the manufacturing arts is undefined, and in many respects they blend together. From the period of the 17th century, science and art have been drawn more closely together, and in later years have made rapid progress, each nutually assisting the other. The establishment of schools of art in connection with manufactures is only of recent date in England; but the manuer in which all classes have aided and supported the various schools of design and mechanics' institutions shows that the nation appreciates the value of cultivating manufacturing art. We see the same thing, also, in the great success which has attended the production of popular works on science in modern times. The discoveries of photography and electro-plating form closer bonds between science and art. For the last closer bonds between science and art. For the last thirty years, the British government has applied annually for a grant in aid of scientific and artistic education, which has been variously applied; but the Museum at South Kensington, which was suggested and corried out by the late raugh lawage and grant of the late raugh lawageted. Attachm at South Kensington, which was suggested and carried out by the late much-lamented Prince Consort, is the most important result of late years. By means of this institution, and others of a like obsracter, a knowledge of science and art is disseminated among the workmen and workwomen of the kingdom. Another step in the same direction is the appointment of eminent sculptors and painters, in order to design models and parterus for manufactures. Although it is only recently that this country has turned its attention to the furthering of manufacturing art, other nations in Europe lave long acknowledged its importance. This Great Exhibitions of 1851 and 1862 by bringing our weakloads in contractivity. 1862, by bringing our workmen in contact with foreign workmen and their work, gave an impulse to our skilled manufactures. In France, more attention is paid to the artistic education of artisans than in any other country, and we see it reflected in all their handicraft. The Conservatoire des Arts et Métiers, in Paris, is a most remarkable institution. It consists of a number of large halls, each of which is devoted to some particular trade, or branch of manufacture, and contains a perfect collection of the raw and the manufactured produce, together with all the implements employed in the process. A lecturer is appointed to each hall, for the instruction of the people. It has been in existence more than sixty years, and was first suggested by the celebrated philosopher Reno Descartes, early in the 17th century. The government is so convinced of the importance of this establishment, that it supports it with an annual grant of 150,000 frances. The selection and arrangement of the objects in these halls are very interesting, since, by exhibiting the implements and muchines that have been used from mediaval times up to the present day, the gradual improvement can be noted at once. In one department, porcelain and china ware in all stages of

undertaking as this, and the Museum of Science and Art at Kensington is a step in the same direction. England, however, took the initiative in the Exhibition engiand, nowever, sook the interest in the Lambition of 1851, and her example was followed by most of the principal nations in Europe, and also by America. The usefulness of such meetings was asknowledged, and now it is felt that if the workman receives sound instruction in science and art, it not only adds to his intelligence and comfort, but also secures the pros-

perity of our manufacturing arts.

Aut-Unions, institutions formed with the object of Aut. Unions, institutions formed with the object of promoting a more liberal patronage of, and a livelier interest on the part of the general public in, the fine arts. The original notion or foundation of syntunious belongs to France, in the days of the first Napoleon. They were alterwards established in Belgium, and, the statement of the state ten years later, were encouraged and adopted in Germany. The art-union of Malines commenced its operations in 1812; that of Munich in 1823. The eminent Alexander von Humboldt, who took great interest in these institutions, recommended their adoption; and his advice was carried into effect in Leipsie, Dresden, Berlin, Halberstadt, Breslau, and other towns and cities, and, in 1833, nearly every important town in Germany could boast of its art-union. Since then, groups of associations, each including several towns, such as Hanover, Cassel, Brunswick, Gotha, Halberstadt, Mag-deburg, and Halle, have been formed for the encouragement of works of the highest class of art; and the influence of these asthetic associations in improving and refining the general public taste, by the collection and distri-bution of modern works of art, has been most powerful and beneficial. From Germany art-unions were intro-duced into England, where they were formed in the hope of offering to artistic genius and talent a higher aim and purpose than mere imitation. Portraits had long formed the principal means of subsistence to the painter. Pictures of Scriptural, classical, historical, or romantic subjects, were uncared for. The public neglected ideal art, and were indifferent to everything but the reproduction of the objects most familiar to them. A witness examined before a select committee of House of Commons in 1845 stated, that before the the establishment of the art-union in Dublin, "in four cars, during the exhibition of the works of the Roval years, during the exhibition of the works of the moyal Hiberuian Academy, 20s. only were expended on the patronage of art." "30s. annually?" inquired the chairman. "No," replied the witness; "30s. was the entire sum expended in the four years." As a proof of the success that has attended art-unions, in 1856 they expended the sum of £1,000,000 stering in the encouragement of art; in addition to which extraordiencouragement of art; in admitton to which extraoran-mary fact, the purchases of private individuals greatly increased. The constitution of art-unions, which, with some few exceptions, is common to all, is as follows:--Every member pays an annual sum, -- in England usually one guinea, — na return for which he receives an acknowledgment, which serves the purpose of a ticket in the lottery, by means of which the pictures, statues, and other works of art purchased with the whole sum thus contributed, are distributed among the different members. A certain amount of the money is generally kept in hand, and applied to the execution of an engraving, a copy of which is presented to each of those members who have drawn a blank in the lottery. This engraving is usually the work of a local engraver. An exhibition of the works of local artists, though lately the majority of associations have admitted those of strangers, takes place once a year. The method of distributing the funds of the unions varies in different places. In London the money itself is distributed by lot, and the holders of prizes are compelled to expend it on the pictures exhibited, the selection being left to it on the pictures exhibited, the selection being left to their own judgment. On the Continent, the whole sum collected for the year is placed in the hands of a committee of gentlemen, elected for their artistic tastes and acquirements, who select works of art, which are distributed to the subscribers by lot. Con-siderable controversy has arisen between the partisans of the two systems, and it may be presumed that each method is best adapted for its locality. On the Con-tinent and in Edinburgh, the members of art-unions prefer to have their prizes chosen for them by compasiderable controversy has arisen between the partisans of the two systems, and it may be presumed that each method is best adapted for its locality. On the Continent and in Edinburgh, the members of art-unions that in Edinburgh, the members of art-unions prefer to have their prizes chosen for them by competent to have the hard the prizes chosen for the prizes chosen for them by competent to have the hard the prize chosen for them by the hard them below the hard them below the hard them by the hard them below the hard them below the hard the

ARTM, air'-use (formerly aron, supposed to be sa ancient Egyptian word), in Bot., the typical gen. of nat. ord. Araces. The only British species is A. macidatus, the common Cuckoo-pint, Wake-Robin, or Lorde-snd-Ladies, and probably the Long Purples of Shakspers. This curious perennial is found growing in shady places, hedge-banks, rough grounds, and groves: The flowers, which come to perfection in April and May, are momecious; that is, the seres are contained in different flowers on the same plant. They are arranged on a succulent axis, terminating in a club-shaped receptacle termed a spadix, of a purple or yellowishreceptacle termed a spadix, of a purple or yellowieb-white colour, and inclosed in a membranous sheath denominated a spathe. The berries are of a fine scarlet colour, and help to adorn our hedges in autumn. They are very poisonous, and the whole plant contains acrid and poisonous juices. The tubers, which are filled with starch, are dried, powdered, and used in France as a cosmetic, under the name of cypress powder. The as a cosmette, under the name of cypress powder. The starch, separated from acrid juices, forms Portland arrowroot, which was formerly prepared in large quantities in the island of Portland, where the plant grows in great profusion. In the fresh state, the tubers are stimulant, diaphoretic, and expectorint, and were formerly used in the form of an emulsion in obstinute rhenmatism.

ABUNDELIAN MARBLES, ar-un-de'-li-an, a collection specimens of Greek and Roman sculpture, mad of specimens of Greek and Roman sculpture, made between the years 1607 and 1614, by Thomas Howard, earl of Arundel and Norfolk. His grandson Henry Howard, who subsequently became duke of Norfolk, presented part of this valuable gathering of the relies of antiquity to the university of Oxford, in 1607, at the suggestion of the celebrated John Evelyn, who, with Mr. (afterwards Sir William) Petty, was engaged by the earl to render assistance in the laborious undertaking. The collection in its entire state numbered 37 statutes 128 houts and 250 pieces of markles bered 37 statues, 128 busts, and 250 pieces of marble bearing inscriptions; besides afters, sercoplagi, and fragments of various kinds, end a cabinet of gens, meduls, and intaglios, acquired at Venice for the sum of £10,000. Lord Arundel left England for Autwerp at the commencement of the civil war between King the commencement of the civil war between king Charles I, and his parliament, taking with him the more portable portion of his collection, such as his gens and smaller pictures. After the death of Charles, a great number of the statues and paintings still remaining in Arundel House fell into other hands at the general confiscation of royalist property ordered by the Commons, and only a small part of the original collection, including the famous Parian chronicle, was handed over to the university of Oxford. The specimens that still remained in the possession of the Arundel family were disposed of at various sales, and some were purchased by Sir William Fermer, whose som became first earl of Pomfret, and were alterwards presented to the university of Oxford, in 1755, by Henrictta Louisa, dowager-countess of Pomfret, when they were placed with the inscribed marbles that had previously come into the possession of that body. The Parian chronicle was acquired by purchase at Smyrns, by Sir William Petty. It contained in its perfect state a chronological table of the leading events in Grecian history, from 1582 B.C. to 264 B.C. A part is lost, and the remainder is much injured and defaced in many places. It is supposed to have been cut in the isle of Paros, about 263 B.C., the period of time at which the record ends,—Ref. Selden's Marmora Arundelliana, 1628; Prideaux's Marmora Ozoniessa, 1676; Chandler's Marmora Oxoniensa, 1763.

ABUNDO, d-run-do (probably Lat. arundo, reed, or from Celtic aru, water), in Bot., a gen. of grasses, the species of which frequently attain a considerable size, and are found in many climates. A. phragmites, the common reed, is a well-known species, the culms being largely employed for thatching and other useful

ABYAN, OF ARIAN, LANGUAGES. (See INDO-GRE-

## Asagræa

tweive connecs, or one pound. The oldest form of the as,—that coined in the reign of Servius Tullus,—bore the figure of either a bull, ram, sow, or boar upon it. Afterwards asses had upon one side the two-faced head of Janus, and upon the other the prow of a ship; whence the phrase made use of by Roman boys whether the phrase made use of by Roman boys whether tossing up,—"Capita ant navim" (heads or ship). In the first Punic way 2814, 12, the the which the second of the phrase way 2814, 12, the second of the phrase which the second of the phrase way 2814, 28 tossing up, "Capita ant navim" (heads or ship). In the first Punic war, 264—241 n.c., the as, which till then had weighed twelve ounces, was coined of the same weight as the sextans, or two ounces; and Pliny informs us, that by this means the republic was enabled to liquidate its debts. Under the dictatorship of Q. Fabius Maximus, 217 B.C., the weight of the as was diminished to one ounce. Previous to the reduction cummissed to one ounce. Frevious to the reduction to two ounces, ten ssees were equal to a denarius, the principal silver coin among the Romans,—that is, to about 54d. English. (See Denarius.)

Assersa, dis-d-gre-d, in Bot., a gon. of plants belonging to the nat. ord. Melanthacea or Colchicacea.

The most important species is A. officinalis, a native of Mexico, and the principal, if not the only source of the Sabadilla, Cevadilla, or Cabdilla of the shops, which consists of the fruits and seeds. The seeds are officinal, and yield the alkaloid veratria, which has been used externally as a rubefacient in rheumatism, gout, and neuralgic affections, and also internally in similar cases, in doses of one-twelfth to one-sixth of a grain. It is a most powerful poison. Sabadilla seeds ave been employed as an anthelmintic. They are called lice-seeds by the Germans; because, when powdered and applied externally, they destroy vermin.

powdered and applied externally, they destroy vermin.

ABRECTIDA, or ASSIGETIDA, is-siz-je-it-id (Persian, asa; Lat. fostidus, fetid), the name of a fetid
gum-rosin, used in medicine on account of its antispasmodic and more or less stimulating properties,
and extensively employed in Persia and the adjacent countries as a condinient, just as garlic and other allied plants are employed in Europe. The umbel-The umbelliferous plant Narther, or Fernia asafatida, yields the greater part of the asafatida of commerce; but, in all probability, other species of Ferula, and also other plants, yield the drug. Royle suggests that Prangos pabularia may be one of the sources. The peculiar,

pabularia may be one of the sources. The peculiar, and, to Europeans, offensive odour of seafactids, is attributed to the presence of sulphur in combination with allyle. See ALLYLE.

ASAPUS, See ALLYLE.

ASAPUS, See ALLYLE.

ASAPUS, See ALLYLE.

Of the obscurity which long rested on the true nature of these fossil crustaceans. In this genus the carapace is wide and much decreased, the widels lobe distinct. is wide and much depressed; the middle lobe distinct; the head-shield rounded in front, and terminating posteriorly in a sharp process on cach side. The eye is compound, consisting of several thousand lenses. (See TRILOBITE.)

(See ABARUM.) ABARABACCA.

ABARDACCA. (See ABARDA.)

ABARDA, &s'-à-rum (Gr. a, not, saron, feminine),
in Bot., a gen. of plants belonging to the nat. ord.

Aristotochiacea. The species A. europaum, a native Aristotochiucea. The species A. europaum, a native of Europe, is a rare plant in the woods of Britain. of Europe, is a rare plant in the woods of Britain. The root which forms the drug asarabacca contains a camphor-like principle, and a bitter principle called asarin, which is combined with gallic acid. It was formerly much employed as an emetic, but has been superseded by ipccaouanhs, which is milder and safer. It is still occasionally used as an errhine,—that is, a medicine to be snuffed up the mose, in headache and ouththalmia, and is supposed. nose, in headache and ophthalmia, and is supposed to be the chief ingredient in the powder sold as cephalic anuff. The species A. canadense, the Canada snakeroot, or wild ginger, is another medicinal plant, the rhizome being used in the United States as a tonic, disphoretic, and aromatic stimulant.

ASERTOS, dis-best for (Gr. asbestos, incombustible), a fibrous variety of hornblende, so soft that it can be spun and woven into fabrics. It is remarkable for being incombustible; and for this reason it was nor peng incombustible; and for this reason it was used by the ancients for wrapping up their dead before placing them on the funeral pile, in order that more of their ashes might be lost. They also used it for napkins, which, when soiled, were passed through the fire. They likewise used it for lamp wicks. It has received but few applications in modern times. Chemically it is a silicate of magnesia and alumins. The localities in which it is found are

### Ascension-Day

numerous. It was so plentiful in Coraica some years ago, that it was used for packing instead of tow.

ASCARINES, ds.kir'-i-dees (Gr. askurico, I jump),
parasitic worms which inhabit the intestines of snimals. They belong to the genus Entozoa, and are ranked in arey octong to the genus Envisor, and are ranked in the order of Numariolea. One of the common estspecies, the A. lumbricoides, which is very like the common earthworm, is found frequently in the intestines of men, and of horses, oxen, &c. They have been observed fifteen inches in length, and they are often the cause of facern diseases which has committee around fatal. The of severe disease, which has sometimes proved fatal. The mouth of this worm is only formed for suction; hence it is unable to injure the coating of healthy intestines. In a very young state, ascarides have never been found either in man or the other animals. Persons laving in damp valleys are said to be most liable to suffer from them. The A. vermicularis, or threadworm, is very common among young children. It is white, and about half an inch long. It infests the lower part of the intestines in great numbers. (See VERMIFUCE, THEELDWORM.)

ASCENDANT, is-sen'-dunt (Lat. ascendere, to rise upwards), a term in Astrol., applied to the first or strongest house in the scheme of any person's nativity. The ascendant is so called from containing the eastern point of the horoscope, or the degree of the ecliptic rising on the horizon at the time of birth. This was imagined to exercise considerable influence on a pers life and career, according to the supposed nature or power for good or evil of the planet or sign of the ecliptic about to rise at that time, and the relative position of these and other heavenly bodies to each other in all parts of the heavens at that moment. (See

ASCENSION, RIGHT, is-sen'-shun (Lat. ascendere, to rise upwards), a term in Astron. The right ascension of any heavenly body is the arc of the celestial equator intercepted between the first point of Aries and the meridian or circle of declination passing through the object, or the distance east from the meridian, passing through the first point of Aries measured on the equinoctial or celestial equator. It corresponds with longitude on the terrestrial globe; and as the position of any place on the earth is deter-mined by its longitude and latitude, so the position of any object in the heavens is determined by its right ascension and declination. (See DECLINATION.) The right ascension of any heavenly body is ascertained by the aid of a transit-instrument and sidereal clock, the the aid of a transit-instrument and sidereal clock, the former showing its passage across the meridian, and the latter indicating the time when the passage takes place. The sidereal clock beats seconds, and is so constructed and regulated, that the hour hand describes a complete revolution in 24 hours from the time of the passage of any star across the meridian to its return to the same point. The heads across the same control of the same con the passage of any star across the meridian to use return to the same point. The hands are set at 0h, 0m, 0s., when the first point of Aries is on the meridian, and the time shown by the clock when any other celestial body passes the meridian is therefore its right ascension, or distance from the first point of Aries in time; and if the time shown be multiplied by 15, the distance in degrees, minutes, and seconds is obtained. Oblique ascension is the arc of the celestial equator intercepted between the first point of Aries and that point of the equator which rises at the same and that point of the equator which rises as the same time with any heavenly body. Ascensional difference is the difference between the right and oblique ascen-sion of any object. The terms oblique ascension and ascensional difference are old expressions, seldom used in the present day: the latter was chiefly applied to the sun, because the sun's ascensional difference converted into time shows how much he rises before or after six o'clock.

ASCENSION-DAY, one of the great religious festivals of the Episcopal as well as of the Roman Catholic of the Episcopal as well as of the Koman Ustnoice church. As its name denotes, it is intended to com-memorate the ascension of our Lord into glory, after his last appearance upon earth. Ascension-day has been observed in the Church from the earliest times, and is believed by some to have been instituted by the Apostles themselves, or their immediate successors. It is held on the Thursday next but one preceding Whit-Sunday; and is hence also termed Holy Thursday. The week in which it occurs is usually called Bogation week, from the rogations (petitions or litenies) which

were anciently used by the minister of each parish in perambulating his district, which he did on Ascen-sion-day, or on one of the three days immediately preceding it.

preceding it.

Ascartoss, is-self-i-ei-zm (Gr. askeo, I exercise),
signifies nowadays those who exercise themselves in
the contemplation of divine things; but among the
Greeks, with whom the word originated, it was applied
to those athletes and wrestlers who were accustomed, by rigid abstinence from all sensual and effeminating indulgences, to harden their bodies for the personal induigences, to inside their boutes for the personal contest in the public games of the country. This is the primary signification of the word; but it soon came, among those with whom it originated, to bear a deflected or secondary meaning. In the schools of philosophy, and particularly among the Stoics and Cynics, it came to be applied to that severe discipline to which those persons subjected themselves, by mas-tering their passions and desires for the sake of that tering their passions and desires are the sake of their ideal virtue which they all sought. From these philosophers it gained a tertiary signification in passing to the Christians. Among them it was applied to all who wrestled with Satan, with the world, and with the flesh, and thus endeavoured to exalt themselves by a severe course of personal renunciation above this world, where they were strangers and sojourners. But the earliest ascetics we read of had an eastern origin. The Brah-mins and other sects in Asia carried this practice to a monstrous extent, since long before authentic history The yogis and fakirs of the present time, the suicides in the sacred Ganges and under the wheels of the car of Juggernaut, are only a repetition, in a civilized age, of what was done by their remote ances-tors long anterior to any authentic record we have of the country. The Buddhists, who generally dwell the country. The Buddhists, who generally dwell considerably to the cust of India, carried the principle of asceticism to a great height. They despised the world: they lived a life of solitude and beggary; they mortified the flesh, and abstained from all uncleanness. And so they do to the present day. The Chinese, the Persians, and even the Egyptians, have contemplated life usually in a much more just way, and have not carried their asceticism to anything like the same ex-treme. In the early centuries of Christianity, the ad-herents of the comparatively new religion were more exemplary for purity of morals than for the practice of ascetic severities. But before long, in Egypt and else-where, they endeavoured to escape from the sinful world in which they lived, and, by fasting and prayer, sought for divine aid around the shores of Lake Marcotis and in other parts of the Christian world. Asceticism assumed a more intellectual shape among the Neo-Platonists of Egypt than it has ever done in any other part of the world. Its greatest names are Philo, the Jew, the father of the system, Plotinus, Porphyry, Iamblichus, and Proclus. Philo has left us a history of it in his De Vitá Contemplativa. Even in the 2nd century of the Christian era we find societies of men and women living together under vows of continence.
Thetendency to outward manifestation and to inward and spiritual life began to decline in Christian communities.
This gave rise to the wholesale system of monasticism, which withdraws men and women from the world, under the mistaken idea that thereby they can promote better the aim and end of human life; and immures them in separate establishments, and within separate inclosures, under the idea that they are there kept away from the evil that is in the world. The Greek church has kept much free from ascetic practices than the Romish one; and even the Mahomedan system has melted to some extent under the thawing tendency of modern civilization. The Waldenses of the 11th century, the Menuonites and the Shakers, the Methodists and the Quakers, and the modern Sisters of Mercy, have all had more or less of an ascetic spirit clinging

Ascians, āsh'-i-āns (Gr. a, not, and skia, shadow), a term applied to those inhabitants of the globe who at certain times of the year have no shadow. Such are the inhabitants of the torrid zone, where the sun being twice a year in its zenith,—in other words, being perpendicular to their heads,—no projecting shadow is thrown.

seas, belonging to Cuvier's order Acephala, without shells. They have two orifices, by means of which they breathe and feed : one is branchial, the other anal. They are encased in a soft leathery tunic, inclosing a second mantle or tunic, which is muscular, and adheres second mantile or tunic, which is muscular, and adheres to the first only near the orifices. Their nature is very spathetic, and they remain fixed to a rock or a piece of seaweed, living upon the animalculae which are drawn in with the water that is constantly passing through their ciliated respiratory organs. The action of the cilia seems to be involuntary. The screes of ascidians are distinct; and their chief nervous centre is airmated between the openings of the muscular tunic is situated botween the openings of the muscular tunic. In 1828 MM. Milne-Edwards and Audouin discovered In 1829 MM. Milne-Edwards and account that an ascidian does not begin life as a fixed animal, but was able to more about like tadpoles, by means of but was able to move about like tadpoles, by means of a vibrating tail. After a time it attaches itself to a plant or rock, and the tail disappears. Many of the ascidians are splendidly coloured, and often cling about seaweed like bunches of strange fruit. They are divided into two classes,—compound and solitary ascidians. (See ZOOPHYTE, POLYPE.)

ASCITER, üs-si'-tese (Gr. askites, from askos, a bottle), a term employed in Med. to denote abdominal dropsy, or dronay in the helly. (See INDERS.)

a term employed in Med. to denote addominal dropsy, or dropsy in the belly. (See DROPSY.)

ASCLEPIAD, äs-kle'-pi-ild, in Ancient Poetry, is the name of a species of verse, so called after Asclepiades of Tragilos, in Thrace, a soholar of Isocrates. He wrote some tragedies, fragments of which still remain. The verse consists of four feet, of which the first is a spondee, the second a choriambus, and the third and fourth dactyls, as in the following line from Horace:—

Mæccinās atāvis | ēdītē | rēgībūs.

ASCLEPIANCEE, as-kle-pi-d-dai'-se-s, in Bot., the Asclepias or Milkweed ord. of dicotyledonous plants, included in the sub-class Corolliflora,—shrubs or trees commonly lactescent, and frequently with twining stems. The order is at once distinguished by a curistems. The order is at once distinguished by a currously-formed five-cornered stigms, and by the grains of pollen cohering in wax-like masses, which, when the anther dehisces, become attached to glands at the angles of the stigma. There are 157 genera and about 930 species, which are mostly tropical, abounding in South Africa, India, and equinoctial America. Some are cultivated in British gardens and bothouses for the cake of the heart fifth or writing flowers the base. Of are cultivated in British gardens and hothouses for the sake of the beantiful or curious flowers they bear. Of these the most familiar are different species of Asclepius, or Swallow-wort, the beautiful and fragrant Stephanoits floribunda, and the climbing Hoya carnosa. Nearly all the plants of this order have acrid juices, which render them stimulating, emetic, purgative, and diaphorotic medicinal agents. The milky juices of many species contain caoutchoue or India-rubber. Some species yield useful fibres, others edible tabers, and one (the cow-plant of Ceylon) a nutritious milk, which is used as food. (See ASCLEPIAS, CALOTROPIS, CYMANCHUM, HEMIDESMUS, GYMNEMA, and MARSDE-MEA.)

ASCLETIAS, ŭs-kle'-pi-ds (Gr. name of Esculapins, the god of medicine), in Bot., a gen. of plants, the type of the nat. ord. Asclepiadaces. The common English name for the gen. is Swallow-wort. The species are mostly American, and many of them poscess powerful medicinal qualities, as one might expect from the generic name. They are herbaceous plants, seldom of a twining habit, with opposite, whorled, or alternate leaves, and flowers arranged in simple umbels between the leaf-stalks. The corolla is five-parted and relieved. The stamens five in number, alternate with reflexed. The stamens, five in number, alternate with renered. The stamens, are in numer, alternate what the lobes of the corolls, and have curious horn-like appendages. The species A. syriaca, Syriau or Virginian swallow-wort, was formerly thought to be a native of Syria, but is now regarded as an American plant. The white acrid juice of this plant contains esoutchout. The seeds are covered with down, which is frequently employed in America for making wadding term applied to those inhabitants of the globe who at certain times of the year have no shadow. Such are the inhabitants of the torrid zone, where the sun being twice a year in its zenith,—in other words, being perpendicular to their heads,—no projecting shadow is thrown.

Acoustants, as-sid-i-ans, a term usually employed to distinguish a genus of molluscan animals, found in all from the stems of A. tenacissma the Jetee or Toalist the same of the stems of A. tenacissma the Jetee or Toalist the same of the stems of A. tenacissma the Jetee or Toalist the same of the stems of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of A. tenacissma the Jetee or Toalist the same of the

goose fibres are obtained. The root of A. tuberosa is much esteemed by the American doctors, particularly by those styling themselves eclectice, as a disphoretic and expectorant. The last-named plant, which is commonly known as the batterfly-weed or pleurisyroot, is frequently cultivated as an ornsmental gardenflower. In Arabia the young shoots of A. stipitacea are eaten like assurance. are eaten like asparagus.
Ash. (See Franklys.)

ASE. (See Farxive.)
ASE. (See Farxive.)
ASE. (See Farxive.)
ASERS, (See Farxive.) tion of cupels for assaying purposes. (See ASSAYING.)
The ashes of the Boghead mineral (which see) consist principally of silicate of alumina, and are used in the manufacture of Dahlke's patent silicated carbon-filters. (See FILTERS.)

Ashlan, or Ashlen, ash'-lar (Ang.-Sax.), a term in Masonry, applied to stones, whether rough, as when taken from

the quarry, dressed. or when used for the facing of walls, which may be plain, tooled, orrusticated. In Nicholson's Ar chitectural Dictionary, laring is used to signify the

ASHLAR. operation of bedding the slabs of stone employed for facing brick or rubble walls; and asklering as a technical term in Carpentry for the short pieces of upright quartering used in garrets to cut off the acute angle between the floor and the sloping rafters of the roof.

ASHORE, histor, in Mar., a term used to signify on land, as opposed to aboard. A ship is said to be

ashore when she has ran upon the ground or on the sea-coast, either by accident or design.

ASH-WADNESDAY is the name given to the first day of Lent, from the Roman Catholic ceremony of strewing sense on the head as a sign of penitence. The ashes used on this day are said to be those of the palms conservated on the Palm-Sunday before. The ashes are first conservated on the alar, then sprinkled with holy-water, and afterwards strewed on the heads of the priests and the assembled people, the officiating priest repeating the words, "Remember that thou are dust, and shalt return to dust." The ceremony is said to The ceremony is said to have been introduced into the Church by Pope Gregory

service is appointed to be read on this day, containing the owners denounced against imponitent sinners.

ASIATIC SOCIETIES, dis-bli-bl'-bl, pre certain societies that have been formed for investigating the lanties that have been formed for investigating the languages, literature, history, antiquities, &c., of Asia. Some of these exist in Asia, others in Europe. The oldest society of this kind is the Bataviaasch genootschap van Kunsten en Wetenschapen, founded in Batavia in 1731. It was speedily followed by the Asiatic Society of Calcutta, which was founded by Sir William Jones, for the purpose "of inquiring into the history, civil and natural, the antiquities, arts, sciences, and literature of Asia." The first volume of its pro-

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ceedings was published in 1788, under the title of the Asiatic Researches, and the series was continued up to vol. xx., published in 1836. In 1832 the society issued vol. is of the Journal of the Asiatic Goelety of issued vol. is of the Journal of the Asiatic Society of Bengal, a work which is continued down to the present time. In 1804 the Literary Society of Bombay was instituted, under the presidentship of Sir James Mackintosh, and was followed by the Literary Society intosh, and was followed by the Literary Society of Madras. The first Asiatic Society founded in Europe was the Société Asiatique of Paris, which, in 1822, commenced the publication of the Journal Limitique, a work which still appears regularly. In 1823 the Royal Asiatic Society of Great British and Ireland was founded, and in 1824 received a royal charter: since 1834 it has regularly issued a Journal of Transactions. In 1845 the German Oriental Society, Decische Morgeniändische Gesellschaft, was instituted at Leipsie: it publishes annually a journal of proceedings. sic: it publishes annually a journal of proceedings. In 1812 an American Oriental Society was founded at Boston. The most recent of this class is the Societé Asiatique, established at Constantinople in 1852. Most of these societies, besides their journals, publish, from time to time, translations or editions of oriental works,

Asp, dsp (Lat. aspis), a name confined by naturalists to the Vipera aspis, a vonomous snake, peculiar to the European Alps, but commonly applied to several species of poisonous serpents. The asp is often mentioned by both Greek and Roman writers; but the most common and celebrated would seem to be that called by the Arabs Haje Nascher. This animal measures from three to five feet in length, is of a dark green colour, marked obliquely with bands of brown. The haje is marked obliquely with bands of brown.

closely allied to lo, or spectacled snake of India. Forskoel, a Swedish naturalist, who has written on the animals of Egypt, tells us that the jugglers of Grand Cairo have the art of taming the haje, taking care, however, to de-prive it of its poisoned fangs, though even then they avoid its bite when irritated. The habit which this scrpent has



of erecting itself when approached, made the ancient Egyptians imagine that it guarded the places it inhabited, and accordingly they have represented it on their temples sculptured on each side of a globe.

their tempies sculptured on each side of a globe,
ASPLARGUE, as-pār-ā-pus (probably from Gr. sparasso, I tear), in Bot., a gen. of plants belonging
to the nut. ord. Liliucea, the Lily family. The
species are herbacoous, or shrubby plants, growing
wild in the southern parts of Europe and in Africa.
A. officinalis, the common asparagus, has long been
cultivated for the sake of the young succulent shoots
called furice which form a much setterned to

called turios, which form a much esteemed article of food. In the wild state the shoots are slender and tough, but by cultivation they are obtender. The ancient Romans were well acquainted with this The ancient Romans were well acquainted with this delicate culinary vegetable; and Pliny mentions a variety which grew near Ravenna, producing shoots so large that three weighed upwards of a pound. It is now cultivated in all the temperate regions of the world, and to a very great extent near London, Paris, and Vienna. In no part of Europe is it grown to such of Europe is it grown to such perfection as in the market-gardens round London. The asparagus of Mortlake is par-



ARPARAGUS.

ticularly large and succulent, and has long been prized by epicures. On the continent, great pains are taken in preparing the soil for this plant, by forming exca-vations, and filling them with layers of turf, hones, wood-chirts spand, loam, and fresh manure; but though plantations on such beds last longer than those formed by English gardeners, they do not yield better shoots; and it gas justly be questioned whether they are equally profitelist to the cultivators. There are many local varieties of asparagus, but they may all be re-garded as slight modifications of two well-marked sorts, namely, the red-topped and the green-towned. In the ticularly large and succulent, and has long been prized namely, the red-topped and the green-topped. In the namely, the reactopped and his green-topped. In the histonen gardon asparagus is generally grown in beds four fact broad, and in rows a foot or eighteen inches apart, with the space of nine inches between every two plants in the rows. The plants are either raised seed where they are to remain, or raised on a seed bed the preceding year, and transplanted. The value of the crop depends on the soil being dry, sandy, well trenched, and powerfully manured. The trenches should be from two and a half to three feet deep. During the winter the beds are covered with dung or litter, to protect the shoots from the frost; in spring, this covering is raked off into the alleys and dug in, while the beds are stirred with a fork to admit the air, heat, and rain to the young shoots. Asparagus from seed may be cut the third year, is in perfection during the fifth, and will continue good for ten or twelve years. The season for cutting is from the middle of April to the middle of June. Asparagus is often forced, generally by placing the roots on dung or tan-beds, but sometimes by covering the beds with dung. The ear-liest crops are obtained by the first mode, but the roots are lost. The culinary proparations of asparagus are few, the delicate flavour being easily overpowered. It is best boiled alone, and served on toast with melted butter. It is sometimes introduced into soup, and into delicate made dishes. Asparagus-shoots contain a peculiar crystalline principle, to which the name asparagin has been given: this has a specific action on the urinary organs, and its properties have caused asparagus to he popularly employed as a lithic. In medicine, the shoots, roots, and flowering stems of A. officinalis are occasionally employed as diuretics. The roasted seeds have been used as a substitute for coffee. The young shoots of the species A. tenuifolius, A. acutifolius, and A. albus, are enten in the south of Europe. — Ref. for recipes, Mrs. Becton's Book of Household Munagement.

ABPARAGIN, as pār'a-jin, a crystalline body, pro-cured from the young shoots of the asparagus, from the roots of the marsh-mallow and liquomice, and from other plants of a similar nature. The juice is expressed and evaporated, and the brown impure crystals are redissolved and treated with animal charcoal. On

being recrystallized, the asparagin forms in perfect octahedra or rhombic prisms.

ASPARTIC ACID, üs-par-tik.—An acid obtained from asparagin. When an aqueous solution of asparagin is heated under pressure, aspartate of ammonia is formed, which, if heated with baryta, forms the aspartate of that earth: the baryta is then precipitated by sulphuric acid. On evaporation, the aspartic acid crystallizes in thin rectangular tables.

ASPEN. (See POPULUS.)

ASPEN. (DER FOYLUS.)
ASPENULA, its.perul-lä (diminutivo of Lat. asper, rough), in Bot., a gen. of plants belonging to the nat. ord. Galiaceae, the Madder family. The species A. odoruta, the woodruff, is one of the most fragrant plants found in our woods: it contains the natural perfume to mittal abounts have given the natural perfume found in our woods: it contains the natural periume to which obemists have given the name of coumaris. A. cynauchicha, another indigenous species, is commonly called Quinsy-wort, on account of its supposed value as a remedy in sore throat.

ASPHAIT, ASPHAITE, or ASPHAITUM, is fall (Gr. asphaltos), a bituminous substance, found in the tertiary strata in different parts of the earth, evidently produced forms and by the action of heat. It is much used as a

rrom coal by the action of heat. It is much used as a parement when mixed with certain proportions of lime, and, gravel, or pounded stone. It is insoluble in alcohol, but is readily dissolved by turpentine, with which it forms a cearse varnish. From being found on the shores of the Dead Sca, it was formerly called or the shores of the Dead Sca, it was formerly called "Jewe" pitch." The finer sort, dissolved in turpentine, as much used by artists; but is apt to crack under the least displacement, by law, amounts to an asportation or carrying away.

Ass. ass (Lat. asinus; Fr. dne, for asse; Ital. asino), (Equus asinus), an animal too well known, at least in a domestic state, to need description here.

It is found wild in the same parts of Asia as the horse, from coal by the action of heat. It is much used as a

influence of variable temperature. Asphalt pavement was first introduced into this country by Mr. Charlege, who obtained the asphalt from Seyssel, in the Jara Mountains. It has not succeeded in London, being a support to the more than the support of the support speadily worn out by the enormous traffic. Asphait, when distilled, gives rise to numerous products, one of which, the so-called parafin oil, has lately risen to great commercial importance. Coal-tar is artificial

asphalt. (See BITUMEN, PETROLEUM.)
ASPHALTIN, as-falt'-in, a black substance, dissolved out of asphalt by oil of turpentine, insoluble in alcohol.

and ether.

Asthodelus, üs'-fo-de-lus (Gr. a, not, sphalle, I supplant), in Bot., a gen. of plants belonging to the nat. ord. Liliacea, the Lily family. It includes several beautiful perennials, with fleshy finger-like roots and upright annual stems covered with long leaves. The yellow and white asphodels, A. Luteus and A. aibus, have long been cultivated in Britain as garden-flowers. Immense tracts of land in Apulia are covered with the letter spaces which affords are on purpolar party to the latter species, which affords good nourishment to the In ancient days it was sacred to Proservine.

and used in funeral devenumies.

ASPHYXIA, &-fx-i-d (Gr. a, not, and sphusis, pulsation), literally signifies cessation of pulsation, and is used in Med. to denote that state of body and is used in Med. to denote that state of body during life in which the pulsation of the heart and arteries cannot be perceived. In asphyxia, the action of the lungs is suspended, and the blood no longer undergoes that purifying process so necessary to life. Hence the body becomes allled with impure blood, the powers of sensation and voluntary motion are sus-pended, and, if the proper means of restoration are not resorted to, death will speedily ensue. Asphyxia may be produced by various causes; as by whatever prevents the necess of air to the lungs, as strangulation, drowning, choking, &c.; or whatever interferes with the action of the nerves that are concerned in respiration, as paralysis, cold, stroke of lightning, &c. It may also be produced by breathing an impure or a too rarified atmosphere. (See Drowning, Strangulation, Suffocation, &c.)

ASTIDIUM, as-pid'-i-um (Gr. aspidion, a little buckler), in Bot., a gen. of ferns (which see). The fronds of the species A. fragrans possess aromatic and slightly bitter properties, and have been used as a substitute for tea.

ASPIDURA, ils.-pi-du'-ra (Gr. aspis, shield, oura, tail), in Geol., a gen. of fossil star-fishes, so named from the buckler-like arrangement of the bony plates which protect the arms. They are peculiar to the muschelkulk of Germany, and are closely related to the exist-

Asprants, de'-pi-rait (Lat. spiritus asper, harsh breathing), in the Gr. Gram., is a name given to a certain mark or accent (thus ') placed over the initial vowel of certain words to indicate that it is to be pronounced roughly or harshly, as if preceded by an &. All words beginning with a vowel have either a rough or soft breathing,—the spiritus asper or the spiritus lenis (thus'), because a word beginning with a vowel can only be distinguished in the pronunciation from the preceding word by in some measure drawing the breath. Certain consonants are likewise called aspi-

breath. Certain consonants are likewise called appirates, from the harsh breathing entering into their pronunciation: these are  $\phi$ ,  $\chi$ ,  $\theta$  (phi, chi, theta).

Asplenium, as -ple'-ni-um (Gr. a, not, splen, spleen), in Bot, a gen. of ferns, included in the sub-ord. Polypodiese. Many species are common in Great Britain, being known as spleen-worts. They were formerly used in medicine, but have now fallen into disuse. A. Ruta-muraria is popularly known as wall-rue. A. Trichomanes is an elegant little forn, common nocks and old walls. it is often utilizated in cases on rocks and old walls: it is often cultivated in cases and on garden rockwork.

ASPORTATION, ds-por-tai'-shon (Lat. ad, to, and porto, I carry), in Law, is the carrying away of goods. Thus, in all felonies, there must not only be a taking, but a carrying away: cepit et asportavit was the old law Latin. But the least displacement, by law, amounts to an exercisting or asswring away:

and it is here that we find it make the best figure in a state of domestication. In these countries it would seem that the ass was tamed before the horse; and to this day, in the East, asses are far more generally used as beasts of burden and draught than horses. There, howsver, instead of being despised and neglected, cars is taken to cultivate the breed, by crossing the finest specimens. Even the wild as is procured for this purpose. "The asses of Arabia," says Chardin, "are, perhaps, the handsomest animals in the world. Their coat is smooth and clean: they carry the head and it is here that we find it make the best figure in are, perhaps, the handsomest animals in the world. Their coat is smooth and clean; they carry the head clevated, and have fine and well-formed legs, which they throw out gracefully in walking or running. They are used only for the saddle, and are imported in vast numbers into Persis, where they are frequently sold for 400 livres, and, being taught a kind of easy ambling pace, are richly caparisoned, and used only by the rich and luxurious nobles." The ass is, properly speaking, a mountain animal. Its hoofs are long, and turnished with an extremely hard rim, leaving a hollow in the centre, by which means he is enabled to tread with more security on the slipperty sides of hills and craggy places. Its most general colour is mouse-colour, with a blackish stripe strending along the spine to the tail, and crossed by a similar stripe over the shoulders. tail, and crossed by a similar stripe over the shoulders. The female goes with young eleven months, and seldom produces more than one foal at a time.

ASSAFETIDA. (See ASAFETIDA)
ASSAI. (See EUTEFFE.)
ASSAIS INATION, "is-sais-is-nai-shon (Etymol. uncertain), is strictly the murdering a person for hire. The term is also applied to killing by treachery or sudden

Assassins, as-sas'-sins, those who kill, by treachery and violence, persons unprepared for defence. The word assassin is said to have originated from a certain prince of the family of Arsacidæ, popularly called Assassins, who lived in a castle between Antioch and Damascus, and trained, in blind obedience to his communds, a number of young men, whom he employed in murdering the princes with whom he was at emity. According to Colonel Chesney, the Assassins, or Ismail, still hold their chief seat at Kulat-el-Masryad, in Persia, and have several strongholds in the mountains of Tripoli. They are called Assassins from their immoderate use of haschischah (henbane), which produces an excitement amounting to fury. The first chief and law-maker of this singular tribe was Hassan Ben Sabah, to whom the Orientals gave the name of Sheikh-el-Jebelz, but who was better known in Europe as the Old Man of the Mountain, a wily impostor, who made funatical and implicit alaves of his subjects, by imbuing them with a religion compounded of that of the Christians, the Jews, the Magi, and the Mahometans. The principal article of their belief was that the Holy The principal article of their belief was that the Holy Ghost was embodied in their chief, and that his orders proceeded from the Deity, and were declarations of the Divine will. They believed assassination meritorious when sanctioned by his command, and courted danger and death in the execution of his orders. In the time of the Crusades, they mustered to the number of 50,000. So great was the power of the sheikh, or chief, that the averagins of every quarter of the close of 50,000. So great was the power of the sheath, or chief, that the sovereigns of every quarter of the globe secretly paid him a pension; and Philip-Augustus, king of France, understanding that the sheikh had ordered his assassination, instituted a new body-guard, distinguished for their courage and activity, called sergens d'armes, who were armed with bows and arrows and brass clubs; and be himself noter ventured in public without a club loaded with gold or iron. The Knights-Templars alone dared bid deflance to this terrible and subtle foe. Among the victims of their daggers was Courad, marquis of Montferrat, who was regulared in the market place at Twee in 1102 al. daggers was Corrad, marquis of Montferrat, who was murdered in the market-place at Tyre, in 1192, although some historians have attributed the crime to Richard I. For a long time this fearful sect reigned in Persia and on Mount Lebanon. Holagoo, or Hulaku, a Mogul Tartar, in 1254, dispossessed them of several of their strongholds; but it was not till some years after that they were completely extirpated by the Egyptian forces sent against them by the great suitan Bibars.

to another, whether from malice or wantonness; as by to another, whether from malice or wantonness; as by striking at him with or without a weapon, though the party striking him misses his aim. So, drawing a sword; throwing a missile with intent to wound or estrike; presenting, agun at a person within the distance to which it will carry, or pointing a pitchfork at a person standing within reach; holding up one's fist at him in a threatening or insalting manner; or with such other circumstances as denote, at the time, an intention (coupled with a present ability) of using actual/foleace against his person. There are many other acts which will in law amount to an assault: but they are too will, in law, amount to an assault; but they are too numerous to be inserted in a work of this nature. For an assault, an action for damages will lie, or the aggressor may be indicted at the quarter sessions, or proceeded against by summons or warrant of justices of the peace.

Assault, in Mil. Language, is a sudden and general; attack made by a besieging army to obtain possession

of a fortified post.

Assavine, as-sai'-ing (Fr. essayer, to try), a quanti-tative analysis performed for the sake of discovering the amount of one particular constituent in a compound The term is generally applied to the determination of gold or silver in alloys of these metals; but it is also used to denote any process for determining the commercial value of any substance by the separation of its valuable portion. Thus lichens and indigo are assayed for their colouring matter, galls and oak bark for their tannin, and ores for their metal. The assaying of gold and silver is generally performed by the process of cupelling. Bone-ash is mixed with water, made into a little cup and dried. This is called the careful and has the cup, and dried. This is called the cupel, and has the property of absorbing oxides when they are combined with oxide of lead in a state of fusion. Silver is assayed by mixing it with a certain quantity of lead, determined by the amount of impurity suspected to exist in the alloy. The mixture is melted in the capel in a current of air, until the whole of the lead is converted into oxide, which dissolves the other impurities, and carries them down with it into the cupel, the silver being left behind in a pure state. Silver alloys are also assayed by dissolving them in nitrie acid, and precipitating the silver in the form of chloride by a standard solution of chloride of sodium. This method is now adopted in the English, French, and Belgian mints, as well as in those of the United States. Gold is generally assayed by the process of quartation. It is mixed with three times its weight of silver, and nine times its weight of lead, and expelled as described above. The whole of the impurities are thus got rid of, and an alloy of silver and gold remains. This is above. The whole of the impurities are thus got rid of, and an alloy of silver and gold remains. This is beaten into thir plates, which are thrown into nitric acid, which dissolves out the silver and leaves the gold untouched. The large amount of silver is added to prevent any particles of that metal existing in the gold from being protected by it from the action of the acid, and remaining undissolved. For the assaying of the other metals,—Ref. Percy's Metallurgy.

Assembly, ds.sem'ble, is a term formed from the French assemble, which signifies literally the meeting together of a number of persons in one place for the

together of a number of persons in one place for the same object or design. In a more limited sense, it is applied to important meetings of a political or eccla-siastical nature. These have usually other names, under which the more important of them will be found noticed; as, councils, convocations, synods, comitia,

ASSEMBLY, NATIONAL, was the name assumed, on 17th June, 1789, by the commons, who formed the third estate of the general assembly convoked by Louis XVI. of France on 5th May, 1789. They constituted themselves a national assembly, to which the destroy of the problem and cleave afterwards adhered. deputies of the nobles and clergy afterwards adhered mardered in the market-place at Tyre, in 1192, although some historians have attributed the crime to Richard I. For a long time this fearful sect reigned and framed a constitution, whence they are also termed the Constituent Assembly. They dissolved on the action Persia and on Mount Lebanon. Holagoo, or Huckey and the Mogul Tartar, in 1264, disposessed them of several of their strongholds; but it was not till some several of their strongholds; but it was not till some years after that they were completely extirpated by the Egyptian forces sent against them by the great Assayirs, as-sold (Lat. assultus, from Fr. assailer, and the seminatof regal power, which ended in the overtone sessant, assail, fall upon), in Law, is an attempt or offer, with force and violence, to do a corporal hurt

# Assembly of Divines

September 21st, 1792, having first summoned a national convention, which met on the same day. This last was invested with sovereign power to decide the fate of the mongrehy, and to introduce a new form of gogernment. ASERMELY OF DIVINES, WESTMINSTER, was an assembly of 121 olergymen and thirty laymen, distinguished for learning and piety, summoned by an ordinance of parliament in 1632 to meet at Westminster. If or settling the government and literary of the settling t ster, "for settling the government and liturgy of the Church of England, and for vindicating and clearing the said church from false expersions and interpreta-tions, to There were also four clerical and two lay representatives from the Church of Scotland. The representatives from the Church of Scotland. The first-meeting of the Assembly took place on the 1st July, 1643, and the last on 22nd February, 1649, during which they had met 1,163 times. The chief ruits of their lubours were.—1. An humble advice to parliament for ordination of ministers and settling the presbyte-rian government; 2. a directory for public worship; 3. a confession of faith; 4. a larger and shorter cate chiam; 5. a review of some of the Thirty-nine Articles.

Among the more distinguished members of this assembly were Usher, Saunderson, Lightfoot, Selden, Gataker, Greenhill, Arrowsnith, Reynolds, Calamy, and Twiss. The four Scotch divines were Henderson, Gillespie, Rutherford, and Baillie.

"Assimply, THE GENERAL of the Church of Scotland, is the highest ecclesiastical court of Scotland, which meets annually at Edinburgh in the month of May, and sits for about ten days. It consists of representatives, clerical and lay, from the several presbyteries of the adultable of the several presbyteries of the church, and a few other members. Its delibera-tions are presided over by a moderator, elected annually; and there is also present at its sittings a royal commissioner, representing the crown, but who takes no part in its proceedings. It forms the court of takes no part in its proceedings. It forms the court of appeal from the presbyteries and synods. Since the disruption in 1843, the Free Church of Scotland has also its general assembly, which likewise meets annually at Edinburgh in May, and otherwise resembles the other, except that it has no royal representative.

Assubly, Unlawful (Fr. assembler, to flock together). An unlawful assembly is the meeting of three or more persons to do an unlawful act, whether they do it or not.

ASSINT, as-sent' (Lat. ad, to, and sentio, I think), in Phil., is that act of the mind by which we accept something as true. It is the work, not of the understanding, but of the reason; and is free, when it is not the unavoidable result of evidence; necessary, when the withholding of it involves a contradiction.

Assent, Royal, Tark by which bills that have passed the Houses of Parliament become law, and without which they are null, constitutes one of the highest prerogatives of the crown. It is no mere form, but a prerogatives of the crown. It is no mere form, but a bond fide exercise of legislative functions, though there has not for many years been an instance of its being withheld: the last is said to have been in the reign of Queen Anne. The royal assent may be given by the sovereign in person, robed, crowned, and seated on the throne in the House of Peers, with the Commons standing at the bar, or by commissioners appointed for that special purpose, and for that single occasion. Of late years, except in the case of bills augmenting the royal income, the practice has been to give the royal assent by commission; but, in the former case, the sovereign usually prefers a personal manifestation of thanks. The commissioners are usually three or four of the great officers of state. The royal assent to each bill is amounced by the clerk of parliament in Norman-French. Having read the title, he says, if it is a bill of supply,—Le roi (or la reine) remercie ses loyal subjects, accepte leur bénévolence, et ainsi le seute; if any other public bill,—Le roi le seut ; and if a private bill,—Soit fuit comme il est desiré. Should the sovereign bill,—Soit fatt comme u est acesre. Snould the sovereign refuse assent, it is in the form of Le roi (or la reine) s'atricera. In the case of acts of grace or amnesty which originate with the crown, and which are signed by the sovereign before being laid before parliament, and are only read once in each house, the clerk administration of the partial through a follows: dresses the throne as follows: Les Prélats, Seigneurs, et Commons en ce present Parliament assemblés, au nom de tout vous autres subjects remercient très humblemen votre Majeste, et prient à Dieu vous donner en sante conne vie et longue.

## \*Assignes

Assurrow, as-ser'shon (Lat. 1d, to, and sero, I join), is a term employed in Logic to denote the affirmation or denial of something.

Assessed Taxes, de-seed, are certain taxes raised upon houses, servants, horses, carriages, dogs, ac, under various acts of parliament. The date of their first introduction has been variously stated, and their nature and amount have varied according to the exi-

Assers, in matters of law, string by him on the cench.

Assers, &-sets (Fr. assez, enough), in Law, are either real or personal. Where a man has lands in fee-simple, and dies seized thereof, the lands which come to his heir are assets real; and where he dies possessed of any personal estate, the goods which come to his executor or administrator are assets personal. Assets are also divided into assets per descent and assets inter maines. 1. Assets by descent are lands which descend to the heir of a person dying seized thereof, and owing specialty or simple-contract debts. In that case, the estate is considered as assets to be administered in a court of equity for payment of the debts, the specialty debts having preference. 2. Assets inter maines are where a man indebted makes executors, and leaves them sufficient to pay his debts and legacies; or where some commodity or profit arises to them in right of the testator, which are called assets in their hands. This term is also applied com-mercially to any available property for the payment

of a man's debts.

Assignto, "is'-se-en'-to (Span., treaty), is a term specially applied to a treaty between the Spanish government and some other nation, by which the former, in consideration of certain payments, grants the latter a monopoly of supplying the Spanish colonies in America with negro slaves from Africa. As early as the reign of Charles I. of Spain, a treaty of this kind was concluded with the Flemings. Similar compacts were entered into with the Genoese (1580), Portuguese (1696), and with the French Guinea Company (1702), which then took the name of the Assiento Company. In 1713 the celebrated Assiento treaty with in was concluded at Utrecht, and was made over by the government, for thirty years, to the South-Sea Company. One of the conditions of this treaty was, that the company had a right to send yearly to these Spanish colonies a vessel of 500 tons, laden with all sorts of merchandise. The misunderstandings that arose out of this led to a war between the two countries in 1739. At the peace of Aix-la-Chapelle, in 1748, the company had their rights for the remaining four years quaranteed to them; but they relinquished them at the convention of Madrid, in 1750, in consideration of a sum of £100.000.

Assignat, as seen-ya (Lat. assignatus, assigned), the name of the paper currency issued by decree of the National Assembly of France, with the approbathe ABROMAI ASSEMBLY OF FRANCE, with the approperium of the king, April 1, 1799, and so called from the national property being assigned as security. Atfirst, 400,000,000 francs were issued; but, a few months later, 800,000,000 more were issued, and subsequent issues increased the number to about 45,000,000,000 francs.

increased the number to about 45,000,000,000 francs. The consequence was that they became of almost no value, and at length, in 1796, they were withdrawn from the currency.

Assigner, de-si-ne' (Lat. assignatus, from assigno, ad and signo, I mark or sign), one who is assigned or appointed by another to do any act or perform any business. It also signifies one who takes any right, title, or interest in property. by an assignment from title, or interest in property, by an assignment from an assignor, or by act of the law. Assignees are by deed or in law. An assignee by deed is when a lessee deed or in taw. An assignee by deed is when a lessed of a term, og the owner of personal property, sells or assigns the same to snother; that other is his assignee by deed. Assignee in law is he upon whom, by law, the property devolves, without any appointment of the person; thus, an executor is assignee in law to the testator; and the persons upon whom the title to

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### Assignee of a Bankrupt

and disposal of a bankrupt's estate devolves, is an assignce in law of the bankrupt, by virtue of the statute which vests the property in him on his appointment

Assigned of A BANKRUPT. In order to convert the estate of a bankrupt into money for division amongst the creditors, an assignee or assignees are spointed. In the first instance, an official assignee is appointed by hallot by an officer of the Court of Bankruptcy, who, immediately on the adjudication of bankruptcy, takes possession of the estate, and retains possession of it until the appointment of a creditors' assignee. The creditors' assignee is chosen at the first meeting of the creditors assomes is enosen at the mrss meeting or one creditors under the bankruptery or an adjournment thereof, by a majority in value of the creditors who have proved their debts; and, upon his appointment, all the estate of the bankrupt, both real and personal, is divested out of the official assignee and vested in him. The powers and duties of such assignees are regulated by "the Bankruptcy Act, 1861."

Assignment, de-sine-ment (Lat. assignatio), in Law, is the transferring and setting over to another of some

right, title, or interest.

ASSIMILATION, &-sim-i-lai'-shon (Lat. adsimilatio, from ad, to, and similis, like), the act of organized bodies, by which they convert foreign substances into their own proper substance, by which food is converted

their own proper sanstance, by which their own into nutriment. (See NUTRITION.)

Assizs, distinc' (Lat. assessio; Fr. assis, part. past from the verb assoir, to sit).—The term, in its present acceptance, implies a court, place, or time when and where the writs and processes, whether civil or criminal, are decided by judge and jury. The counties, for the purpose of holding the assizes, are divided into eight circuits, and judges are assigned by commission to hold their assizes twice a year in every county, except London and Middlesex. The judges sit by virtue of four several authorities. 1. The commission of the peace.

2. A commission of oyer and terminer, directed to the judges and gentlemen in the county, by which they are empowered to hear and determine treasons, felonies, and misdemeanours, by whomsoever committed.
3. A commission of general good delivery, directed to
the judges and clerk of the assize associate, to try every prisoner in the gaol committed for any offence what soever; but none but prosoners in gaol, and to discharge such against whom no bill is preferred or found. 4. A commission, or writ of nies prius, which is a consequence of the ancient commission of assize being annexed to the office of justices of assize, by the Statute of Westmir ster, the second, 13 Edw. I. c. 30, by which the judges are empowered to try all questions of fact issuing out of the courts at Westminster that are ract issuing out of the courts at westminster that are then ripe for trial by jury, and in which the venue is laid in the county. These commissions are accom-panied by writs of association, by which certain persons are directed to associate themselves with the justices and serjeants, that a sufficient supply of commissioners may not be wanting. But, to prevent the delay of justice by the absence of any of them, there is also issued a writ of si non omnes, directing that, if all cannot be present, any two of them (a justice or serjeant being one) may proceed to execute the commis-sion. In law the assizes are but as one day, and the entry of every proceeding at them refers to the area day of assize.

ASSOCIATION, de-so'-si-ai'-shon (Lat. ad, to, and socius, a companion), is a union of persons or a society formed for mutual assistance, or for the joint carrying out of some definite object. The value of combined effort in carrying out objects where individual exertions would utterly fail, is very manifest. Many undertakings, in which it would be impossible for individuals to embark, we see carried on with success around us by means of associations. More particularly is the term applied to a union of individuals for the accomplishment of great social, political, or scientific objects.
Association is one great feature of civilization, and is ons of the most marked characteristics of the present age. "Men have learned," says Dr. Channing, "what wonders can be accomplished in certain cases by wonders can be accomplished in Certain cases by union, and seem to think that union is competent to mything. You can scarcely name an object for which come institution has not been formed. Would men spread one set of opinions and crush another,-they

## Association of Ideas

make a society. Would they improve the penal code or relieve poor debtors,—they make societies. Would they encourage agriculture, or manufactures, or scines,— they make societies. Would one class encourage ey make societies. —they make societies. Would one class encourage horseracing and another discourage travelling on a Sunday,—they make societies." But, while combinations may be mighty engines for good, they also may be made great engines for evil; as, where they attempt to put down opinions, whether true or false, by mere force of numbers, and thus interfere with or subvertible that freedom of thought on which all truth depends. (For associations for the nursous of controlling the (For associations for the purpose of controlling the rate of profits or of labour, see COMBINATIONS.) Associations, too, are often injurious in interfering with free thought and action among the individual members; as, in order to joint co-operation, it is necessary for each to abandon a portion of his own individual views and adopt those of the majority of his co-associates. They are for the most part passive bodies, guided solely by the will and management of a few individuals among them.

ASSOCIATION. AFRICAN. (See AFRICAN ASSOCIA-

TION.)

ASSOCIATION OF IDEAS, in Mental Phil., is the name given to that principle of the human mind by which certain ideas,certain ideas,—thoughts, feelings, or emotions, become connected together in such a way, as that they afterconnected together in such a way, as that they are wards tend to recall or reproduce one another. A good illustration of this is given by Coleridge, in his Biographia Literaria. "Seeing," says he, "a mackerel, it may happen that I immediately think of gooseherries, because I, at one time, ate mackerel, with gooseberries as the sauce; the first syllable of the latter word being that which had co-existed with the image of the bird so called, I may then think of a goose. In the next mo-ment, the image of a swan may rise before me, though I had never seen the two birds together. In the first two instances, I am conscious that their co-existence in time was the circumstance that enabled me to recollect them; and equally conscious am I, that the latter was recalled by me, by the joint operation of likeness and contrast. So it is with cause and effect; so, too, with order." Various philosophers have attempted to define these laws of mental association. According to Aristotle, they are three,—resemblance, contrast, and contiguity. Hume, who has generally been followed by modern philosophers, makes them resemblance, contiguity, and causation. Some have endeavoured. again, to reduce all the phenomena of association to one great law. The first attempt of this kind was made by Augustine, who said that thoughts that had once co-existed is the mind, are afterwards associated toge-ther. Sir William Hamilton states, that all the laws of association may easily be reduced to two, --simultaneity, and resemblance or affinity; under the former, including thoughts that are in the mind together, or in immediate succession; under the latter, all that have such a connection existing between them as that the thought of the one involves the thought of the other. These two he then reduces to one, which he calls the law of redintegration, or totality, including, in the first place, those thoughts which arose at the same time, or in immediate consecution, and in the second, those thoughts which are bound up into one by their mutual affinity. "Thoughts or mental activities having once formed parts of the same total thought or mental activity, tend, ever after, immediately to suggest each other." It seems evident that all the phenomena of mental association may be reduced to one great law,—that of contiguity, by which ideas that have been in the mind together, or in close succession, ever after manifest a tendency to recall or reproduce each other. In persons of lew ideas—the unsaturated or ignorant—this principle is very marked; Shakespeare's Mrs. Quickly is an admirable instance of this, as she narrates with a naming ninuteness the various incidents that bappened at the time when Sir John Falstaff made her a promise of nurriage. When, however, the mind has become possessed of a number of ideas, those that have been frequently before it become associated in various ways with numerous other ideas; and here we observe a law of mind analogous to the law of attraction in matter, by which an idea, instead of recalling all the ideas with which it may have been associated, which would result in endless confusion, selects only certain

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That some, rather than others, are selected, of them. of them. That some, rather than others, are selected, depends upon a variety of circumstances; as, the frame of mind of the individual at the time, their recentness, or the frequency or length of time they may have been associated together. Another principle of association is that of a part suggesting a whole, or a whole one or more of its parts. Most of our ideas are made up of a number of others, any one of which may suggest the whole idea, or the whole idea may suggest one or more of them. Then paper may suggest whiteness or smoothof them. Thus, peper may suggest whiteness or smoothness, or any of these may suggest paper. In like manner, a word may be resolved into its component parts ner, a word may be resolved into its component parts or syllables, any one of which may suggest other words of which it forms a part. In this way, one word suggests another word having the same primal orderminal syllables, and hence the rhythmical terminations of the lines in poetry make it much more easily remembered than prose; and the alliteration so frequent in proverbs renders them casy to be recalled. It seems that by this principle of mental analysis the law of similarity or resomblance may be activated, the mind as it were similarity may be a this index the mind as it were semblance may be explained; the mind, as it were, separating an idea into its component parts, till it obtains one feature which exactly corresponds to a feature that goes to make up another idea. One idea may suggest another idea with which it had never previously been associated: this is done by means of a third idea common to both. Thus, Hannibal may suggest Napoleon, though they may have never been as sociated together in the mind, from their having both crossed the Alps under similar circumstances. intermediate idea is here evident; but frequently it is not perceived, though in every case its influence may be traced. To this same principle, we think, may be referred contrast, or that tendency of the mind to be referred contrast, or that tendency of the mind to proceed from one idea to its contrary; as, from virtue to vice, from light to darkness, from riches to poverty; there being, in every such case, an intermediate idea common to both, of which the one denotes an abundance, the other a deficiency. It is upon the association of ideas that memory depends. (See Mirmoux.) ASSONANCE, 28'-80-mince (Lat. ad., to, and sono, I sound), is a term used in Poetry and Rhet, to denote that the words of a phrase or verse have the same sound

that the words of a phrase or verse have the same sound or termination, yet without making proper rhyme. This is commonly a fault in English, but the Romans sometimes used it with elegance; as \_\_'' Militem com-paravit, exercitum ornavit, sciem lustravit."

ASSONANT RHYMES, "is-so-nant (Lat. ad, to, sono, I sound), is a term applied to a kind of verse common among the Spaniards and Portuguese, where the vowels

only are required to rhyme.

Assumption, iis-num's shon (Lat. ad, to, and sumptus, taken), is the name of a festival celebrated by the Homan Catholic and Greek churches on the 15th of August, in honour of the miraculous ascent of the Virgin Mary into heaven.

ASSUMPTION, in Logic, is the name given to the minor or second proposition in a categorical syllogism. It is sometimes also applied to the consequence drawn from the propositions of which an argument is com-posed. Thus we say the premises are true, but the assumption is captious.

ASSURANCE, LIFE. (See INSURANCE.)

Assuran Architecture, as-air-i-an.—It is impossible to give any detailed account of the style of architecture adopted by the Assyrians; but from the architecture acopted by the Assyrians; but from the important discoveries made by Botta at Khorsabad, and Layard at Kouyunjik, we are enabled to form some idea of the general features that characterized the buildings they raised as temples for their gods and palaces for their kings. It appears that when a site for any structure of great size and importance had been determined on, the first thing that was done was to raise an enormous mound, several acres in super-ficial extent, and from twenty to forty feet in height: they did this to obtain an imposing elevation for their buildings. The country through which the Tigris and Euphrates take their course is perfectly flat, and their Empirates take their course is periectly flat, and their palaces, which seem to have been low in proportion to their length and the extent of ground they covered, would have appeared dwarfed in height, and comparatively insignificant, if they had been raised on the lard of the soil itself. These satisficial platforms were not merely heaps of earth, but were systematically constructed of sun-dried bricks, with an outer facing of sive structures than the soil of the country mixed with

hard calcareous stone, brought from the distant mountains, and out in regular blocks. The dimensions of the mound of Khorsabad, which is supposed to have formed the north angle of the city of Ninevels, may be given here to show the immense extent of these constructions, and the labour and time which must bave been expended in piling them together it was formed of two rectangles, in the shape of the letter T, that which is represented by the transverse part being 975 feet long and 442 feet broad, rising 20 feet above the level of the plain; while the other, on which the palace stood, was 650 feet long and 553 feet deep, being 10 feet above theseurisce of the lower platform. The superficial area of the two rectangles was nearly 18 zores. Botta states the height to have been from 40 to 50 feet. The mound at Konyunik was 7,800 feet in circumference, and its area more than four times as large as that of Khorasbad. Access to these terraces was gained by flights of broad must have been expended in piling them together Access to these terraces was gained by flights of broad low steps adorned with sculptured figures; and the low steps adorned with sculptured ngures; and the platforms themselves were undoubtedly gardens, like the famous hanging gardens of Babylon, built by Nebuchsdnezzar for his wife Amytis, which rose one above another on terraces supported by piers and arches, until they equalled the height of the outer walls of the city. The buildings raised on these mounds of the city. The buildings raised on these mounds were quadrangular in form, with portals in each facade, flanked with soulptured winged bulls of great size. The walls were of brick faced with panels or slabs of gypsum, adorned with figures in bas-relief larger than life. The pavement of the apartments consisted of sun-dried or kilu-baked bricks, but the consisted of sun-dried or kiln-baked bricks, but the principal passages were floored with broad flags of stone. The state rooms in these palaces were of great size, many in the palace of Khorsabad being about 118 feet long, and from 22 to 33 feet in breadth; while at Kouyunjik, an apartment was discovered which was 200 feet long and 45 feet broad. The walls of Assyrian cities were of enormous thickness, being, in some cases, 45 feet in width; they were lofty, and were surmounted by square towers at intervals, with battlements for the protection of the archers who were engaged in defonding any beleaguered town. The walls of their palaces were also of great width, being as much as 16, 18, and even 21 feet in breadth; galleries are supposed to have been gonstructed on the top of are supposed to have been constructed on the top of these broad walls by raising rows of dwarf columns on these broad walls by raising rows of dwarf columns on the inner and outer edge, and adding a flat terraceroof plastered on the upper surface. There are no windows in any of the palaces that have yet been discovered, and it is conjectured that they must have been lighted by apertures in the roof, which must have been flat, and formed of horizontal beams supported on rows of columns placed at intervals in the rooms below: a flooring, or rather ceiling, of word was afterbelow: a flooring, or rather ceiling, of wood was after-wards added, and covered with layers of sun-dried bricks. The openings in the roof would probably be surrounded by open parapets, or rows of columns sur-mounted by a similar kind of rooting. Such a method of construction would afford protection from the rain as well as sufficient light and good ventilation; and the strong glare of the summer sun could be moderated by the use of curtains. The immense thickness of the walls would render the rooms cool in summer and warm in winter. It must be remembered that the above description of the method used for roofing these buildings is, to a great extent, hypothetical; but all the Assyrian palaces that have been explored bear traces of having been destroyed by fire; and this could not have been the case unless a considerable quantity of wood had been used in their construction in the manner above indicated. Layers of bitumen were spread between the earth and the bricks and stones which composed the pavement, and also placed behind the alabaster slabs with which the walls were coated, to prevent injury arising from damp. Semicircular-headed openings in buildings represented on some of the bas-reliefs show that the Assyrians were acquainted

chopped straw and hardened by exposure to the sun. All is life and animation in every part of their build-ings; not a plain unsculptured slab is to be seen. They introduced rich colouring into their decorations; and from the fragments found on the floors, and among the heaps of rubbish that fill the rooms, it appears that the brick walls above the carved slabs were faced with enamelled tiles of the richest hues, and that these alabaster panels were set in a brilliant bordering of figures and arabesque patterns common to Eastern architecture. This colouring was most probably carried through the enrichments of the ceilings and the wooden columns that supported them. No stone columns have hitherto been discovered in any of the palaces that have been mentioned above, and they do not seem to have been introduced into Assyrian architecture of the age to which the cities of Nineveh and Babylon belong. Simple in conception and design, massive in construction, and elaborate in ornamenta-tion, the architecture of the Assyrians derived its chief grandeur and imposing appearance of stability and power from the broad base and lofty piles of successive terraces on which their public buildings were always eracted.—Ref. Bonomi's Nineseh and its Palaces.

Assyrian Sculpture.—Although the architecture

of the Assyrians was simple enough, yet this people reached a high pitch in the excessive richness of their sculpture. They seldom made statues or representations of the human form or animals in a complete and per-fect state, but confined themselves to sculpture in basrelief, embossing figures on the surface of the slabs of marmoriform gypsum, with which the sides of their rooms and passages were coated. These bas-reliefs were intended to be pictorial representations of the manners and customs of the people, and, more par-ticularly, of the history of the nation, giving an account of the remarkable events in the reign of any monarch, very much in the style of the Bayeux tapestry, allow ance being made for the difference of material. Or some of these gypsum panels, which are about nine feet high and from three to nine feet broad, carefully joined to present a continuous surface round the walls of any room or passage, some royal personage is represented, attired in richly-ornamented robes, with a tiars on his head, surrounded with a numerous retinue of priests, warriors, eunuchs, and attendants; on others, the attack and defence of a fortified city is depicted, the pursuit of a flying foe, the torture and death of captives, pursuit of a flying foe, the torture and death of captives, and all the varied episodes of war; while banquets, the chase, lion and bull huuts, and the arts of peace, form subjects with which those already mentioned are occasionally interchanged. On some, the cagle-headed figure of Nisroch, and those of other Assyrian deities appear. Some of these are represented with four wings, and accompanied by what is termed the sacred tree; the priests are generally represented with the symbolic flower, apparently taken from this tree, in one hand. The jambs of the portals of their palaces and chambers were assully carried into the figures of winead bulls. were usually carved into the figures of winged bulls and lions with human heads; the head, fore-legs and fore part of the body as far as the shoulders being enside of the block which formed the jamb. One great peculiarity about these figures is, that they are repeculiarity about these figures is, that they are re-presented with firelegs, that they may appear complete, whether viewed in front or at the side. A figure of a man fifteen feet in height was found between bulls of this sort flanking the portals of the palace of Khorsabad; it was strangling a lion apparently in mortal agony, and was supposed to represent "the mighty hunter" Nimrod himself. Representations similar to the figure m the annexed engraving are frequently found on the bas-reliefs at Nimroud and Khorsabad: that from bas-reliefs at Nimroud and Khorsabad: that from which the engraving was copied was found at the latter place, the only perfect figure remaining in the court in which it was discovered. Bonomi imagines it to be "a diviner or magician, one of the four orders of Chaldeans mentioned in Daniel (ii. 2), of whom it was the custom for the kings of Assyris to require the interpretation of dreams." The figure seems to be that of a priest, with the hair and heard carefully dressed, and the head bound with a fillet or circlet, with resettes in front and at the sides. It carries the symbolic flower in its left hand, while in the right it bears a wild he goat or ibex, similar in form to those which are found in the

mountains that surround Mesopotamia. The long flowing robe is adorned with deep fringes and orna-mented borders, and the short tunio which appears below

it is trimmed in a similar man-ner. Bonomi expresses his belief that these Chaldeans and priests were the sculptors and painters of the time. All the specimens of Assyrian sculp-ture that have been found show that they were faithful observ-ers of nature, although they were not sufficiently good draughtsmen to accomplish faithfol reproductions of all they saw around them. The predominance of representations of battles and victories, and crueltics practised to-wards their pri-soners taken in



ASSYRIAN SCULPTURE.

war, furnishes ample proof that they were a proud and imperious people, valuelorious, and boastful, as, indeed, we learn in Holy Scripture; and this is supported by the arrogant character of the cunciorm

ported by the arrogant character of the cunciform inscriptions accompanying their sculptures, which have been deciphered by the skill and ingenuity of Grotefend, Rawlinson, and others versed in oriental languages and literature.—Ref. Bonomi's Ninecch and its Palaces; Buried City of the East.

ASTER, ds'-ter (Gr., a star), in Bot., a gen. of plants belonging to the nat. ord. Compositæ, and containing a great number of species, growing in all parts of the world. One species only, A. Tripolium, the seaterwort, is a native of Britain. Some of the asters are favourite garden-flowers; namely, the New England aster (A. Nova Anglia), the Michaelmas daisy (A. Tradescardi), and the China aster (A. chinensis). The last is the most valued, and is one of the most showy annuals in cultivation. It was brought from China in the early part of the 18th century, and an immense last is the frost variety, and an immense number of varieties, exhibiting great diversities of form number of varieties, exhibiting great diversities of form and colour, have been developed by British and conti-nental florists. The genus Aster has lately been split into six or seven distinct genera, which together form the tribe Asteroida.

ASTERACEE, äs-ter-ai'-se-e, the name given by some botanists to the Composite order of plants. (See COMPOSITE.)

COMPOSITE.)

ASTREISK, de'-ter-isk (Gr. aster, a star), is a mark in the form of a small star (\*), placed over a word or sentence to refer the reader to the margin, or elsewhere, for an explanation, quotation, or the like.

ASTRISM, de'-ter-ism (Gr. aster, a star), a group of stars, a term formerly applied to the collection of

any heavenly bodies forming an entire constellation, and used instead of that expression. It is now taken

and used instead of that expression. It is now taken to denote any small cluster of stars, whether forming part of a constellation or a distinct group.

ASTERN, ö-stern', in Mar., any distance behind a ship, as opposed to shead, which signifies before her; thus, if south is ahead, or on the line to which the stem is directed, north will be astern. It also signifies to act the hindin or at the hinder part of a ship, or towards the hinder part; as, 'to go astern.'

ASTEROIDS, de'ter-oids (Gr. aster, a star, and eidos, like), a number of small planets revolving between the orbits of Mars and Jupiter, four of which were discovered in the first decade of the present century, and the remainder since 1845. They are sometimes called planetoids, an expression meaning 'like a planet,'

which conveys a better idea of their character, in contradistinction to fixed stars; and estra-sodiacal planets, because their orbits, unlike those of the larger planets, are not confined within the zodiac. The larger planets, are not confined within the zodae. The entire number discovered up to the present time (1870) is ninety. Flora, the eighth in order of discovery, is nearest to the sun, with a mean distance of 209,170,000 miles; and Euphrosyne, the thirty-first, the most distant, being about 300,000,000 miles from the centre distant, being about switch, which into the centre of our solar system. The great space that intervenes between the orbits of the planets Mars and Jupiter led Kepler to imagine that there must be a planet revolving between them which had hitherto escaped observation through the smallness of its size; and this supposition was subsequently strengthened by the discovery of a formula known as Bode's law (see Bone's Law), by which the respective distances of the planets from the sun were represented by certain numerical values, the approximate truth of which is shown by reference to their actual mean distances.

ASTERCLEPIS, ās-ter-o-le-pis (Gr. aster, star, lepis, scale), in Geol., the star-scale, a gigantic fossil ganoid istate, in tool, the star state, a grant to sai gatout fish of the Old Red sandstone, so unused from the starshaped markings on the strong plates which protect the head. The structure of this creature is minutely described in Hugh Miller's work "Footprints of the

Creator: or, the Asterolepis of Stromness.

ASTROPHYLLITES, de'ter-of'-ldies (Gr. aster, star, phullon, leaf), in Geol., fossil plants found abundantly in the Coal-measures, Lias, and Oolite, characterized by star-like whorls of narrow leaves surrounding the jointed stems, as in the existing genera Hippuris

and Equiretum.

and Equisclum.

ASTHA, isth'-mā (Gr. asthmazo, I breathe with difficulty), in Med., is a disease of the lungs, characterized by difficulty of breathing, which comes in paroxysms, accompanied by a wheezing noise and a feeling of tightness across the chest. The fit occurs most frequently during the night, suddenly awaking the patient from sleep, who is obliged to assume an upright posture, to prevent suffocation, and to struggle and trust for health with the neverture of continues which must for breath while the paroxysm continues, which is usually for two or three hours. Though a terrible, it is seldom, in itself, a fatal disease. It is frequently it is seldou, in itself, a fatal disease. It is frequently hereditary, or it may arise from some inflammatory affection of the respiratory organs. Among the other causes that may give fise to it, are dwelling in a noist or impure atmosphere, cold, indigestion, mental anxiety. The paroxysms are generally preceded by languor, flatulency, headone, sichness, a feeling of anxiety, and a sense of tightness and fulness about the chest. Physicians usually distinguish three kinds of asthma,—the humid, dry, and spasmodic, according as they are, or are not, attended with cough and expectoration. During the paroxysms, gentle aperients and anti-spasmodic medicines are recommended. A and anti-spasmodic medicines are recommended. and anti-spasmodic medicines are recommended. A blister on the chest, bathing the feet in warm water, a cup of hot coffee, or the smoking of stramonium, are frequently of use. To prevent the return of a paroxysm, the exciting causes are to be avoided; the bowels to be kept gently open, the food to be light and nourishing, sudden changes of temperature to be avoided, regular and moderate exercise to be taken, and a change of climate or of situation to be tried. As regards this last, it has been found that some have here less subject to asthme in the courter others in been least subject to asthma in the country, others in the centre of a town.

ASTREA. (See CORAL, MADREPORE.)
ASTREA, ds-fre'-d, the name of one of the asteroids or planetoids revolving between Mars and Jupiter. It

being generally found at the junction of the shaft of a column with the capital and base. The Egyptians sometimes divided their columns into sections by clusters of astragals surrounding the shaft at intervals. It is generally plain, but sometimes careed to repre-sent reeds bound together with a ribbon, leaves, and beads of various forms. It Gunnery it is a moulding encircling a cannon about six inches from its mouth.

ASTRAGALUS, äs-träg'-ü-lus (Gr. astrayalos, a die), in Anat., is the name of the ankle-bone, or first bone of the foot, upon which the tibis moves. It is so called from being shaped like the die used by the ancients in

their games.

ASTRAGALUS, in Bot., a gen. of plants belonging to the nat. ord. Leguminosæ, sub-ord. Papilionuceæ. More than 250 species have been described, and most More than 250 species have been described, and most of them are hardy plants, either shrubby or herbaceous. The best-known British species are A. hypoglottis, the purple milk-vetch, and A. glycyphyllos, the inquorice-vetch. The species A verus, A. gummifer, A. creticus, and some others, furnish gum-tragacanth, or, as it is frequently termed in the shops, gum-dragon. Tragacanth exudes naturally from all parts of the above plants, or from wounds made in the stems. It is used by British manufacturers for stiffening crape and other light fabrics, and by the perfumers for making bandoline. In medicine it is employed for its demulcent and emolient properties and as a vehicle demulcent and emollient properties, and as a vehicle for the exhibition of more active substances. A. boöticus, an annual species, is cultivated in Hungary, Germany, and other parts of Europe, for the seeds, which are roasted, ground, and used as a substitute for. or an improver of, coffee.

ASTRAL SPIRITS, as'-tral (Gr. astron, a star : Lat. ASTRAL SPIRITS, & Later and (Gr. astron, a star; Later spiritus, a spirit), spirits that were supposed by those who studied demonology and witchcraft in the 15th century to hold the first place among demons and spirits of evil. The Chaldeans, and those who worshipped the stars and fire in the early ages of the world, believed that every object in the heavens possessed an animating spirit, as the human body possesses a soul. In the Medieval times the notion arose that these spirits were sither feller enterly or the spile of soul. In the Mcclawai times the notion arose that these spirits were either fallen angels, or the souls of the dead, or spirits deriving their origin from fire, whose location was the air. They were thought to exercise an influence for good or evil on every member of the human race. Paracelsus and the old alchemists

or the human race. Faracelsus and the old alchemists believed that every one had an astral spirit peculiar to him.—Ref. Chambers's Encyclopædia.

ASTRINGENTS, äs-trinj'-ents (Lat. ad, to, and stringo, I tie fast), substances which have the property of contracting or drawing together the muscular fibre, and which are employed medicinally for the purpose of absolving fluxes humanylage and distribus. The of checking fluxes, hemorrhage, and diarrhea. drugs most commonly used as astringents are alum, accetate of lead, catechu, oak-galls, and rhatany-root.

Most vegetable astringents contain tannin.

ASTROCARYUM, &-to-kair'-i-um (Gr. astron, a star, kuruon, a nut), in Bot., a gen. of palms, including about sixteen species, all natives of tropical America, and remarkable for the formidable spines with which the stems, lcaves, and other parts are armed. The fruits of A. Tucuma and A. aurumuru are eatable. The species A. valqare, the Tucum-palm, is cultivated by the Indians of the Amazon for the sake of the epidermis of the unopened leaves, which they make into dermis of the unopened leaves, which they make into strong and fine thread by twisting thin strips together. Beautiful hammocks are made of this tucum thread. The tucum-palm is much more lofty than the tucumapalm.

was discovered by Hencke, an amateur astronomer, at Driesen, in Germany, Dec. 8, 1845. (See Asterbands) Asteolable, if taken, a moulding, the section of which is a complete semicircle, projecting from a perpendicular dismeter, so called from its resemblance to the project state upper ends and bases of the shafts of columns, and the tended which they used for the same purpose. It is the most simple of all mouldings, being the only the old Greek astronomers to take the altitude of the start, so called from its resemblance to the project at the upper ends and bases of the shafts of columns, and from the entablatures of the Ionic, Corinthian, and Composite orders of architecture, and also in Roman Doric. It is the most simple of all mouldings, being the only one that can project from a plane surface without the aid of a fillet. Its chief use seems to be to bind the aid of a fillet. Its chief use seems to be to bind the different parts of columns and entablatures together,

# Astrology

the term was used to signify a projection of the circles of the sphere on a plane surface, which is now called a planisphere. (See PLANISPHERE.)

planisphere. (See Printsphere.)
Astrology, de-trul-ope (Gr. astron, a star, and logos, a word or discourse), an expression literally meaning the doctrine or science of the stars, but especially taken to signify the art of forcelling future events, and the good or evil fortune likely to befall any man during his lifetime, from the aspect of the however and the relative position of the planets and other heavenly bodies at the time of his birth. This art, which is commonly understood by the torm astrology, is properly called judicial astrology; for, in the early ages of the world, astrology included the science of astronomy, as well as the art of making predictions from the motions of the stars; the early predictions from the motions of the stars; the early predictions from the motions of the stars; the early astronomers, or rather astrologers, making astronomical observations entirely for the sake of acquiring an fusight into futurity, as they imagined. The history of the rise and progress of astrology is nearly the same the fine and progress or astrology is nearly the same as that of astronomy. Its decline may be dated from the time of Copernicus, who showed that the sun was the centre of our solar system, and not the earth, as it had been formerly supposed; and, although this is no argument against the truth of the science, yet the fact that all calculations with regard to the motion of the heavenly bodies had hitherto been based on erroneous suppositions, was mainly instrumental in disabusing the minds of men generally of any reliance that they had previously placed on the deductions derived from the exercise of the art. All astronomers, including Kepler himself, up to his time, have been more or less infected with the idea that their science gave them the power of foretelling events that were about to happen; and remarkable instances have occurred of the verification of astrological predictions; but no one, on reflection, can assert in earnest that the aspect of the heavens at the time of birth can have the slightest influence on a man's character, disposition, and fortunes. If it were so, all who are horn at the same moment (and it is cal-culated that about sixty births occur throughout the world every minute) must necessarily run the same career; and consequently all those who were born at the same time as the emperor Napoleon or the duke of Wellington should have met with similar fortunes. Although at the present time all the people of Eastern nations are believers in astfology, especially those who profess the Mahomedan faith, it is astonishing that this pretended science should even now be practised in England, and that so many are credulous enough to purchase almanacs and other works which profess to foretell coming events, and even to place reliance on the statements put forth in them. The practice of astrology was universal among the Oriental nations at a very early age; and, although its origin is involved in obscurity, it may probably be attributed to the Chaldeans. The Hindoos and Chinese have always attached the greatest importance to it, and the Arabs sedulously cultivated the art, as well as the astronomers who flourished in Egypt before and after the birth of our Saviour, at which period it is considered to have been introduced into Western Europe. The Jews practised it after the return from the captivity in Babylon. It appears that the Greeks were the only ancient nation that gave no credence to the revelations of its professors. As many expressions are met with in the works of our old English authors and dramatic writers which are unintelligible without some idea of the broad outlines of the science, it may not be out of a very early age; and, although its origin is involved the broad outlines of the science, it may not be out of clase to give a brief sketch of its leading principles and the manner in which it was practised. The heavens above and below the horizon were divided by imaginary solve and below as followers were that by magnary oricles, drawn through its north and south points, into twelve equal parts, which were called the twelve houses of heaven. They were numbered in order from the division in the east immediately below the horizon the civision in the east immediately below the horizon which contained the part of the heavens about to rise into yiew. The lines of division were supposed to remain immovable, so that every part of the heavens passed through each house successively once in twenty-four hours. The term horoscope was given to the point of the scriptic about to rise. The first house was palled the accordant, it was the first house point of the scapace bout to rise. The invasion was called the ascendant: it was the strongest, and also known as the house of life; the second was the house of riches; the third, of brethren; the fourth, of 150

#### Astronomy

parents and relatives; the fifth, of children; the sixth, of health; the seventh, of marriage; the eighth, of death; the ninth, of religion; the tenth, of dignitise (this houserwaked next in importance to the first); the eleventh, of friends; the twelfth, of foes. To each division one of the heavenly bodies was assigned as its lord, who was most powerful in his own house. The position of a planetein any house was its distance from the boundary circle or cusp of the house measured on the zodiac; and the part of the zodiac which chanced to be in each house was a point which especially demanded the attention of the astrologer in his consideration of the aspects of the various divisions. The relative position of the heavenly bodies in the different houses at any particular moment was called a theme; and to east the nativity of any one was to form a plan of the heavens in the manner above indicated at the moment of birth.—Eq. Sibly's Occult Sciences; English Cyclopadia—Arts and Sciences.

ASTROLOMA, às rho-lo-mà (Gr. astron, a star, and lobos, a pod), in Bot., a gen. of plants belonging to the nat. ord. Epacriacee. The species A. kumiyas yields the Tasmanian eranberry. This fruit is about the size of a blackcurrant, but is of a green or yellowish colour, sometimes tinged with red, and consists of a viscid apple-flavoured puby, inclosing a large seed. The flowers are of a beautiful scarlet.

ASTRONOMY, astron-o-me (Gr. astron, a star, no-mos, law, rule), the science which gives us an insight into the wonderful construction of the universe, and makes us sequainted with the motions and relative positions of the heavenly bodies. It may be considered as consisting of two great divisions,—practical astro-nomy and theoretical astronomy. Under the former may be classed the labours of the astronomer in his observatory, surrounded by instruments of various kinds, that have been brought to the greatest perfection by the accumulated experience of a long series of years, acquired by the careful observation and research of human intellect of the first order; while under the latter must be placed the calculations of the mathe-matician, who can correct, by computation, the slight errors to which observations made by the best instruments are always liable, and determine the distance, shape, size, orbits, and even weight, of the numerous celestial bodies, as well as the occurrence of celipses and other phenomena, and construct tables of the rising and setting and other ephemerides of the sun, moon, and planets for years in advance, such as those which are found in the Nautical Almanac, for the instruction and guidance of sailors, who find them of the utmost value in determining the position of their vessels and their course from one part of the world to another. Fractical astronomy requires an intimate knowledge of the construction and working of the various instruments by which observations are made, Notices of these are to be found under their respective headings. (See Circum, Sidereal Clock, Equaheadings. (See Circle, Sideneau Cools, Tonial, Transit-Instrument, Pendunce, roblat, Transit-Instrument, Pendudum, Telescore, &c.) Theoretical astronomy, which includes, with the operations of the mathematician, that branch of the science which has been called physical astro-nomy, or the consideration of the observations of astronomical phenomena so that the causes of these astronomical phenomena so that the causes of anome phenomena may be discovered, and the laws of nature which influence them may be deduced, is also treated under the names of the principal subjects which particularly belong to it. (See ADRHATION, GRAVITATION, GEODESY, LIBRATION OF THE MOON, PARALLAY, PER-CESSION OF THE EQUINORS, REFLACTION, TIDAL THEORY, &c.) Definitions of astronomical terms, and the nature of the heavenly bodies, as far as the limited power of man has hitherto been able to determine power of man has hinerto been able to determine them, are also given in their respective places. (See ASTREOIDS, COMPTS, MOON, PLANDER, FIXEN STARS, SUN, SOLAR SYSTEM, ZODIAC, &c.) The early history of astronomy is involved in considerable obscurity; but of all the sciences that have occupied the research of man, it is certainly the most ancient. The minds of the first inhabitants of the earth were doubtless conditioned to the search of the place. soon directed to the wonderful recurrence of the phenomens of day and night; the sun in the fall biase of his meridian glory, now scorching the eastern plains with the intensity of his heat, now welled with mists and clouds that hid for a season his welcome light and

warmth from those who, after a while, ignorantly worshipped his very presence. The changes in the pole moon, gliding over what was imagined to be a rault of saure crystal studded with countless stars, from the silver streak of the horned crescent to the broad shield of her orb at the full, would also be noted with wonder and amazement. Men would soon begin to remark the regularity of these changes, as well as the motion of some stars and the apparent immobility of others; and then records of these observations would be made, and the first link forged of the long chain of discoveries, smong which those of Tycho Brahe. would be made, and the first interest to the long chain of discoveries, among which those of Tycho Brahe, Copernious, Calileo, Kepler, and Newton are the most important, reaching to the addition of member after member to our planetary system, and the great im-provements in the science which have been made and are stills making in our own times. The Chaldreans are, perhaps, the first nation that cultivated astronomy, although the Chinese, Hindoos, and Egyptians equally claim to take rank as the originators of the science. The Greeks, also, were efficient astronomers, and did much for its advancement; they also have the merit of having followed up their observations for the sake of the science itself, while all the above-named people applied it to furnish means of inquiry into the future, and (with the exception of the Chinese, who made it subservient to state purposes), closely connected it with religious, or rather superstitious observances. It with religious, or rather superstitious observances. It may not be out of place to note briefly the claims of the contending nations to the honour of having originated the science. The Chaldman priests observed and placed on record the rising and setting of the celestial bodies, and eclipses of the sun and moon, from a very remote period, as it is stated by Diodorus; they understood the Metonic cycle (acc Metonic Cycle); they used the clepydra, or water-clock, to mark the lapse of time, and the gnomon and hemispherical dial, for determining solstices and the positions of the sun respectively. Alexander the Great. tions of the sun respectively. Alexander the Great, according to the old writers Simplicius and Porphyry, found at Babylon a list of eclipses from 2234 B.C., more than 1,900 years before the conquest of Babylon by that monarch, and sent them to Aristotle. The astromax monarch, and sent them to Aristotle. The astro-nomer Ptolemy mentions a few of these in his writings, the earliest of which is dated 720 n.c. They are, as may be imagined, but roughly made, the time being given in hours only, and the part of the diameter eclipsed within a quarter of an hour; but they happen to be the earliest recorded observations on which any dependence can be placed; and, by comparing them with observations of his own time, Halley was led to the discovery that the moon moves round the earth with greater rapidity now, than in the early ages of the world. The division of the celiptic into twelve equal parts (the twelve signs of the zodiac), and that of the day and night into twenty-four hours, are ascribed to the Chaldmans. The Chinese records of astronomical observations claim to go back to the year 2857 B.C. Nothing of importance is noted in them; a bare list of eclipses of the sun and the appearance of several comets is all that is given. That they were notoriously incorrect fully appears from the circumstance that many eclipses mentioned in this record have been remany eclipses mentioned in this record have been recalculated, and not one prior to the time of Ptolemy can be verified with anything approaching exactness. The Chinese were acquainted with the Metonic cycle and the motions of the planets; but they knew nothing about the precession of the equinoxes until about 400 a.n. The Hindoos rest their claim on a series of observations known set he "Tables of Tirradore," which are assumed to date from the year 3102 n.c., the beginning of the iron age of Hindoo mythology, when a extraordinary conjunction of the sun and moon and an extraordinary conjunction of the sun and moon and all the planets is said to have taken plane. These tables are telieved by competent judges to have been fabricated from data derived by the Hindoo astronomers from the Greeks and Arabs. It is, however, fair to add that there are many who contend that they were compiled from actual observations made by the Mindoos themselves, although commenced at a much later date than the epoch assigned for the beginning of the record. There is much in them that is correct; the earth, and the angalar obliquity of the celiptic technical they appear to be in many points a mean between the tables of an eminent Arabian philosopher, Albategnius, and those of Ptolemy, which seems to furnish in the time of Ptolemy. But the muster mind of the

atrong presumptive evidence of their compilation from these authorities. The Greeks derived their astrostrong presumptive evidence of their committation from these authorities. The Greeks derived their satro-nomical knowledge from the Egyptians in the first place; but the Egyptians have left no records of their observations. The pyramids, which are placed exactly north and south, are supposed to have had some satro-nomical use; and it has been amater of doubt whether the division of the zodiac should not be rather attri-heted to the Econolisms than the Chuldens With buted to the Egyptians than the Chaldmans. buted to the Egyptians than the Chaldwaus. With the Greek philosopher Thales, who flourished about 640 n.o., the real and reliable record of facts connected with the history of astronomy may be considered to commence. Thales is said to have predicted a total eclipse of the sun, which happened at the time he had forefold; but it is a question whether his success in this instance was purely accidental or accomplished by the aid of the Chaldwan Saros. (See Sanos, Chaldwan.) He was the first to show that the earth was a sphere, and not a plane surface, as the ancients imagnetic states of the chaldwan sarbers, and not a plane surface, as the accidents imagnetic states. a sphere, and not a plane surface, as the ancients imagined; and he also gave the Grecian sailors some idea gined; and he also gave the Greenin salors some idea of shaping their course by the stars. Pythagoras, who flourished about 500 B.C., did not consider the earth to be the centre of the universe, but, as it was afterwards shown by Copernicus, that the earth and other planets revolved round the sun. The only improvements and additions to the science before the Alexandrian school, which flourished in Egypt under the Ptolemies some 200 years later, are the introduction the Ptolemies some 200 years later, are the introduction of the Metonic or luni-solar zycle, of nineteen years, by Meton, 432 n.c., which was improved by Calippus about a hundred years afterwards; the first computation of the year of 3652 days, by Eudoxus of Cridius, 370 n.c.; and the idea of the daily revolution of the earth upon its axis, which was taught by Nicetas, a philosopher and astronomer of Syracuse, although the notion is said to have occurred to Anaximander some cennotions said to naveoccurred to Anaximanuer some cen-turies before, who also asserted that the light afforded by the moon was caused by the reflection of the sun's rays from that body. Hitherto everything connected with the science had been vague and unsatisfactory, rays from that nouy. All the second had been vague and unsatisfactory, mere guesses at truth,—guesses which, in the majority of cases, fell very wide of the mark; but with the astronomers of the Alexandrian school, a regular system of observation was commenced. The paths of the planets in their orbits were determined; the relative positions of the fixed stars clearly laid down, and the constellations or clusters of stars in various regions of the heavens, that had been grouped together and denoted by fanctivi outlines of figures of beasts, and burds, and human beings, referring, in many cases, to subjects connected with the old Greek mythology, were duly mapped out and catalogued. The first to subjects connected with the old Greek myshology, were duly mapped out and catalogued. The first Alexandrian school of philosophy may be considered to have existed for 175 years, from the time of Timocharis and Aristyllus, who flourished about 300 B.C., to the death of Hipparchus of Bithymia, the greatest of all the astronomors that lived before the Christian era. The second school commenced with Ptolemy, about 130 A.D., and ended with Pappus and Theon of Alexandria, early in the 5th century, when the Goths Alexandria, early in the 5th century, when the Goths had crossed the Mediterranean, and extended their ravages into Egypt and Northern Africa. The most celebrated astronomers in the first of these Alexandrian schools were Tinocharis and Aristyllus, whose joint observations proved of as much importance to Hipparchus as the rough records of eclipses observed at Babylon were to Halley, enabling the clever Greek to discover the precession of the equinoxes. Contemporary with these was Euclid, better known to us as a new three things in the confitted mathematician, but whose name must not be omitted here, since his clear and logical reasoning must have done much to pare the way for future discoverers, particularly those who turned their attention to the theory of the science. Some years later came Aristarchus of Samos, remarkable for being the first who attempted to ascertain the magnitude of the earth and its distance from the sun and moon, he was also in its distance from the sun and moon; he was also as believer in the Pythagorean theory, that the earth revolved round the sun. Another celebrated astronmer of this school was Eratochenes, who also turned his attention to the determination of the magnitude of the certific and the graphs ability of the certific and the graphs ability of the certific and the certification of the certific and the certific and the certification of the certific and the certific and the certification of the certific and the certification of the certific and the certification of the certification of the certific and the certification of the certification of the certification of the certific and the certification of the certifica

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Astronomy Alexandrian astronomers was found in Hipparchus of Bithynia, who flourished from 160 to 125 s.c., the Newton of his age. He made a catalogue of 1,081 stars, determining the latitude and longitude of each, which is the first list on which any reliance can be placed, as those attributed to Eratosthenes and others are devoid of bearings by which they can be recognized and iden-tified. He fixed, with greater approximation to exact-ness than any of his predecessors, the length of the year, and demonstrated the inequality of the sun's motion. He made most important discoveries respect-ing the moon, determining her mean motion, her apogee and perigee, her parallax, and inclination of her orbit. He calculated eclipses, and discovered the precession of the equinoxes, as it has been remarked; and he was the first who gained an insight into the principles of plane and spherical trigonometry, or measurement by triangles. He also used right ascen-sion and declination for determining the places of the stars; but afterwards fixed their positions by latitude and longitude in preference, applying this method to ascertain the relative situations of places on the earth, storement the relative situations of places on the earth, thereby rendering as great a service to the science of geography as he had to that of astronomy. We may well wonder when we consider how much this old astronomer effected, and that all he did was done without aid from those instruments and appliances which prove such powerful auxiliaries to modern re-search. From the death of Hipparchus to the time of Room the death of Hipparchus to the time of Ptolemy, a period of about 250 years, no astronomer of eminence is met with, and no discovery of any practical utility was made. Ptolemy followed closely in the footsteps of Hipparchus, substantiating or altering the various theories which his predecessor had propounded. Among his chief discoveries were the libration of the moon and the refraction of light. He made a catalogue of the stars, based, most probably, on that of Hipparchus, with the positions corrected by the improvements he had been enabled to effect: he also invented a planetary system known as the Ptolemaic system (see Prolemaic System), which was generally considered to be the true principle of the motion of the universe, until Copernions revived and extended the system originated by Pythagoras. He wrote at great length on astronomy and mathematics, as well as on other sciences, embodying the result of his observations and his various dissertations in a work called "Megale Syntaxis," or the Great Collection, and, by the Arabs, the Almagest. (See Almagest). His successors, with the exception of Pappus, who wrote a commentary on his works, and Theon of Alexandria, were men of little or no note. After the death of these philosophers, the second school of Alexandrian also invented a planetary system known as the Ptoleandria, were men of little or no note. After the death of these philosophers, the second school of Alexandrian philosophy may be considered to have ceased, or, perhaps, to have languished until its total destruction by the Araba, then called Saracens, about the middle of the 7th century. Fortunately, the Arabs preserved the writings of Ptolemy, and, in the year 762 A.D., comcommenced a diligent prosecution of the study of the science, under the fostering encouragement of the Arabian caliphs; and although astronomy under the Arabian caliphs; and although astronomy under the Arabian caliphs can be also be any great discoveries. the Araban caupus; and although astronomy under the Araba was not extended by any great discoveries, yet the careful observations made by these people led to the correction and more accurate determi-nation of many elements of the science that had been sought out by the inquiring minds of the old Greek astronomers. The most distinguished old Greek astronomers. The most distinguished of the Arabian satronomers were Albategnius, or Al Batani, who flourished about 880, Ebn-Yunis, and Abul-Wefa. The first-named of these found out the motion of the sun's apogee. (See Anomalism Yrah.) He also made corrections in the calculation of the precession of the equinoxes, and advanced to a great extent in the knowledge of trigonometry, making use of sines and versed sines. Ebn-Yunis, who lived 1000 A.D., left many tables and results of observations, and was the first to employ subsidiary angles in his calculations. Abul-Weia, who lived at the same time, did

to the world in 1270; while Uleg Beg, a grandson of Timour the Tartar, made observations at Samarcand about the year 1433, and constructed the most correct catalogue of stars that had appeared up to his own time. This prince was as eminent as a geographer as he was as an astronomer. From this time, however, the study of astronomy has gone down among Asiatic nations; their knowledge of the science being solely kept up for the sake of the assistance derived in the prosecution of the study of astrology. In the early part of the 19th century, the attention of European nations was again turned to astronomy. Frederick II., emperor of Germany, ordered a translation of the Almagest to be made during his reign; and Alphonso X., king of Castile, collecting a great number of the most notable astronomers of the age about him, caused a set of tables to be compiled in the year 1263; which are known as the Alphonsine tables. (See Alonsins catalogue of stars that had appeared up to his own are known as the Alphonsine tables. (See Alonsing or Alphonsine Tables.) It was this monarch who was so puzzled by the intricacies and anomalies of the Ptolemaic system, that he gave vent to the remark, that if he had been consulted at the creation of the universe, he would have managed things far better and much more simply. From this time until 1500, nothing is worth recording in the history of astronomy. Copernicus was then twenty-seven years of age, and, attracted by the interest attaching to the study of this science, entered on his laborious researches with the eager and ardent thirst for fame and knowledge so common at his period of life in minds like his. The result of his investigations was a table of the notions of the planets, and a work on the Revolution of the Heavenly Bodies, in which he endeavoured to show the fallacy and error of the system of Ptolemy, intro-ducing in its place what has since been known as the Copernican system (see Coresina to the interest of the motion of the universe. He met with great opposition in the promulgation of his views; and his theory was not esteemed at its true and proper value, because he was unable to answer certain prior to the contract of t tain objections that were made to it, which have since been fully explained away. For thirteen years he boldly contended for the truth of his system; but he died, worn out in mind and body with the wearing toil died, worn out in mind and body with the wearing toil of thought and anxiety, a few weeks after his great work had been given to the world in a printed form. Many astronomers, of all climes and countries, laboured and wrote during the time that clapsed between the death of Copernicus and the year 1600; but of all these the most famous was Tycho Brahe, born 1540. Commencing the study of astronomy at a very early age, he soon determined to devote his life to the propertying of the science, and in 1550 ke here, his prosecution of the science; and in 1582 he began his observations on an island in the Baltic, near Copenonservations on an island in the Datic, near Copera-bagen. He did not adopt the system that had been suggested by Copernicus, but substituted a theory of his own, known as the Tychonic System, in which he asserted that the earth was the centre round which the sun moved, but that all the other planets which the sun moved, but that all the other planets moved round the sun, continually circling about him as he moved onwards in his course round the earth. This theory of Tycho Brahe was received more favourably than that of Copernicus, as there was no argument against it that could not be answered; and it explained all the phenomena of nature fully as well as the theory it was intended to supersede. In addition to the invention of the Tychonic system, he effected great improvements in the instruments then in use. He produced a catalogue of the fixed stars considerably more accurate than any which had preceded it, and made the first table of refractions. He also added greatly to what was already known of the motions of the moon, discovering the moon's variation and annual the moon, discovering the moon's variation and annual the moon, discovering the moon's variation and annual equation (see Equation, ANNUAL), the changing motion of her nodes, and the inclination of her orbit. He improved his tables by neglecting what was called the trepidation of the precession of the equinors, and made very important researches into the nature, course, and distance from the earth of comets, which were previously imagined to be atmospheric bodies. lations. Abul-Weis, who lived at the same time, did much for the improvement of trigonometry, using tan much for the improvement of trigonometry, using tan course, and distance from the sarth of somets, which gents, co-tangents, and secants, in addition to the sines and versed sines of Albategnius, and left tables of the cosine was introduced by Gebir, a Spaniard, some years later. Kepler and Galileo; the former of whom was born In Perzis astronomy had not been neglected. Nasir, 1571, died 1630, and the latter born 1563, died 1943c, eddin compiled tables of observations, and gave them

astronomy to the middle of the 17th century. Building astronomy to the middle of the 17th century. Building on the discoveries of Tycho Brahe, and his own investigations of the orbit of the planet Mars, Kepler was led to the conclusions demonstrated in what are called his First and Second Laws (see Kepler's Jaws), that the courses in which the planets move round the sun are ellipses, having the sun as one of the foci, and that the areas of the orbits are proportional to the times of revolution. His Third Law, that the squares of the periodic times of the planets are proportional to the cubes of their relative distances from the sun, was enumoisted in 1618, nine years after the discovery of cubes of their relative distances from the sun, was enundated in 1618, nine years after the discovery of the first and second laws. Kepler did much to establish the system of Copernicus, and to answer the arguments that had been previously urged against it. Hi last work was the compilation of the Rudolphine Tables, jublished about four years before his death. During the life of Kepler two inventions involved. During the life of Kepler, two inventions, invaluable to the prosecution of the science, were made. The telescope was first constructed in Holland by an optician named Lipperhey; and logarithms were invented in Scotland by Napier of Merchistoun, from whom the clever and gallant Napiere, that have made themselves famous in our own times, were lineally descended. Galileo greatly improved the original telescope, making one which magnified to the extent of a thousand times. one which magnified to the extent of a thousand times. With the aid of this instrument, he soon discovered the satellites of Jupiter, the ring of Saturn, and the phases of Venus resembling those of the moon, as well as the hills and valleys on the moon's surface. He also asserted the truth of the system of Copernicus, which drew on him the displeasure of Paul V., the monarchriest of Rome at that time; and, in the subsequent reign of Urban VIII., in 1633, subjected him to the tender mercies of the familiars of the Holy Inquisition, who wrested from him a recantation of the views he had so ably advocated. It will be impossible to do more than glance rapidly at the salient points in the growth of the science which appear previously to the among of Sir Isaac Newton. Gassendi, in 1631, had watched the transit of Mercury across the disc of the sun; Descartes, an eminent mathematician, had pubsun; Descartes, an eminent mathematician, had published his Cartesian theory; Vernier had invented an instrument, which bears his name, to determine the smallest subdivision of space (see VERNIER); Norwood had measured the meridian from London to York with great accuracy; Gascoigne, Auzout, and Picard had, independently of each other, applied the telescope to the quadrant, and the micrometer to the telescope; Huyghens had constructed the first pendulum clock, and Moreton had made use of the pendulum to assist him in his observations of the differences of the right him in his observations of the differences of the right ascension of the heavenly bodies; Gregory, in 1663, had constructed a reflecting telescope; and Cassini, with many other valuable discoveries, had ascertained the period of the rotation of Jupiter, and compiled the earliest tables of the satellites of that planet. Newton, who was born in the year in which Galiled and the desired that planet. Newton, who was form in the year in which Galleo died, was now twenty-four years old, and had already conceived a notion of the theory of gravitation, to which he is said to have been led by a train of thought arising from the observation of the fall of an apple. (See GRAVITATION.) It was many years before he could satisfy himself of the truth of his speculations, and determine the laws on which his wonderful dis covery rested; but he ultimately published it in his Principia, in 1687. By observations of the comet of 1680, Newton found that, in accordance with the laws propounded by Kepler, the orbits of comets about the sun were elliptic. He also invented fluxions, deterpropounded by Asserting the also invented fluxions, determined the form of the earth, and showed the influence of the moon upon the ebb and flow of the tides. In 1609 he constructed his first redicting telescope. He ended his useful life as an astronomer, mathematician, and philosopher, in 1727. Contemporary with Newton were Halley and Flamsteed, who held the post of first astronomer royal in the Observatory at Greenwich, founded in 1675. Flumsteed was as eminent a practical astronomer as Newton was skilled in physical estate. astronomer as Newton was skilled in physical astronomy. In 1880 he determined the laws of the moon's annual equation; and fourteen years later, in conjunction with Newton, he commenced a series of observations for the improvement of the theories then held respecting the moon's motions, and the laws which

Newton had arrived at respecting the reflection and refraction of light. He made a long catalogue of stars, in which important additions were made to stars, in which important additions were made to those that had already been published, and many series of astronomical observations, which were given to the world in his valuable *Historia Celestis*, which was brought out six years after his death. His successor Halley, who had made researches in the southern hemisphere at St. Helens, discovered the accelerated mean motion of the moon by the sid of the eclipses recorded at Babylon, and preserved in the Great Col-lection of Ptolemy. He also added considerably to our knowledge of the revolutions of comets and their our knowledge of the revolutions or gomes and mature. He was succeeded in his turn by Bradley, who discovered the aberration of light in the year tha Newton died; thus giving incontrovertible proof of the truth of the Copernican system, by determining the fact of the earth's annual revolution round the sun. (See ABRERATION.) It is impossible to give anything approaching to a clear and detailed account of the dis-coveries that recorded and better the sun. covories that succeeded each other with great rapidity from the death of Newton to the close of the 18th century, and the list of honourable names that added these tury, and the list of honourable names that added these discoveries to those of their predecessors, by their skill, perseverance, and research. In 1731 Hadley invented the quadrant; in after-years Bradley observed the phenomenon of nutation. Lacaille, Euler, D'Alembert, and Cassini produced valuable tables, and extended the valuable researches that had already been made in the theories of the motions of the planets, pression, rutation libration, and the advancing water of the planets, pression, rutation libration, and the advancing water. of the sun's apogee. Maskelyne, the fourth astro-nomer-royal, originated the Nautical Almanac in 1767. In 1781 Herschel discovered the planet Uranus, and Laplace calculated the elements of its orbit. Six years after, Herschel constructed his 40-foot telescope, with which he discovered two of Saturn's satellites and the rotation of his ring, as well as the satellites of Uranus, He also found that the Milky Way consisted of closelyare also assign that the minsy way consisted of closely-serried groups of countless stars, and that the motion of the satellites of Uranus was retrograde. The astro-nomical habours of the 18th century may be considered to be closed with the catalogue of nebulæ and clusters. of stars found by Herschel, and the commencement of the great work of Laplace, the Méchanique Céleste. Among the other notable inventions of the same century must be noticed the chronometers constructed by John Harrison, a mechanic of Foulby, near Pontefract, for which he received rewards that had been offered by parliament, amounting to about £25,000. In the opening years of the present century the discovery of the first four asteroids (see ASTERDIDS) between the orbits of Mars and Jupiter was made by Piazzi, Olbers, and Harding; and since that time no less than sixty-five have been added to this group; fully substantiating the idea entertained by Kepler, in consequence of the un-due space intervening between the orbits of the pridue space intervening between the orbits of the primary planets above mentioned, that one or more smaller ones must exist having their path between them. In 1846 the planet Neptune was discovered by a Freuchman named Le Verrier; but the credit of the discovery really belongs to Mr. Adams, of the university of Cambridge, who had acquainted Mr. Challis, professor of astronomy at that seat of learning, with the results of his investigations a twelvementh before the publication of the calculations of Le Verrier. This planet was first seen in the field of the heavens by Mr. Challis soon after he had learned the suspicious entertained of its existence by Mr. Adams; but M. Galle, of Berlin, was the first to place his observations of the newly-discovered heavenly body on record. In 1859 a new primary planet, having its orbit between Mercury and the Sun, was found by a physiciannamed Lescarbault: to this the name of Vulcan was approprintely given. Among the principal astronomical priately given. Among the principal astronomical publications of the present century may be enumerated Piazzi's Catalogue of the Stars, the most complete that we have; Herschel's Catalogues of Stars and Nebuse, and Brisbane's List of the same. Lubbock's researches on the Lunar Theory and his star maps are equally important; and the numerous publications of Airy, Laplace, Challis, and Lalande. Among the principal instruments constructed since the year 1980 may be noted Troughton's Mural Circle, put up at Greanwich in 1812, and the telescope erected at Parsonstown, in

Ireland, by the earl of Rosse. (See TELESCOPES.) Ref. English Cyclopædia—Arts and Sciences; Chambers's Encyclopædia; Lardner's Handbook of Astronomy.

and Museum of Science and Art.

and Museum of Science and Art.

ASTLUM, A-si-lems (Gr. a, not, and sulas, I roh), a sanctumy or piace of refuge to which criminals might fly for safety, and from which it was considered the greatest impiety to take them by force. The Israelites, by God's own appointment, set apart six cities as oities of refuge, to which those guilty of any unpremeditated offence might fly and find protection. The altar of burnt offering was also considered as a place of refuge. Among the Gregks, Thebes and Athens each claimed to have established the first asylum; that at Thebes by Cadmus, that at Athens by the descendants of Hercules. Romithe established an asylum at Rome, between the Romulus established an asylum at Rome, between the two groves on the Capitoline hill. The temples, altars, status, and tombs of heroes, were also anciently regarded as asylums, the temples being held as the most sacred and aviolable refuge. Under Constantine the Great, all churches were made asylums; and by the Grest, all churches were made asylums; and by the younger Theodosius, the privilege was extended to all courts, gardens, walks, and houses belonging to the churches. In 681 the synod of Toledo extended the limits to thirty paces from every church. At length these asylums led to such abuses, that they were generally abolished. (See Sanguaries). The term asylum is now applied to certain institutions whose object is to allaries the condition of the bling deed court is to alleviate the condition of the blind, deaf, and

damb, lunatios, and the destitute.

ASTMPTOTS, de'-im-tote (Gr. asumptotos, not falling together), in Geom., a line which approaches continually nearer and nearer to some curve, whose asymptote it is said to be, without ever meeting it. It is a property

appertaining to the hyperbolic curve.

ATAXIA, a-tax'-i-a (Gr. a, not, taxis, order), storm used in Med. to denote want of regularity in the

expmptoms of a disease or in the functions of the body.

ATCHEVEMENT, in Herald. (See ACHEVEMENT.)

ATELES, itt-e-less (Gr., incomplete), in Zool., a gen. of American monkeys, of that division of the Quadrumans termed Sapajons. The most distinctive characters of the arrangements of the grant area. characters of the genus are, long, slender, but powerful prehensile tails; fore-hands almost entirely without thumbs, or possessing only the merest rudiment of the organ,—whence the name of the genus; a dental system which, in common with all fae American Quadrumans, which, in common with an ene American Quadrumana, consists of two molar teeth more than are possessed either by man or by corresponding genera in the Old World. Other prominent characters of the ateles are round small heads, limbs remarkably long and slender, corpulent bodies. These characteristics have obtained corpulent bodies. These characteristics have obtained for the genus the name of spider-monkeys. Possessing nor the genus the name or spiner-monkeys. Nessessing neither cheek-pouches nor callosities, they are, in these respects, nearly allied to the real ages. Their entire physical conformation fits them to an exclusively arboreal life. Their mode of locomotion upon the earth is slow, awkward, and uncertain. Sometimes they grawl slong in a vacillating fashion, by using their lover forwarms as contiches; separatines they are long fore-arms as crutches; sometimes they urge themselves forward by poising themselves upon their hind-legs, and making use of their long arms and tail as a means of balancing themselves in this, to them unusual position. Naturalists and travellers relate derful stories of their docility, intelligence, many wonderful stories of their docility, intelligence, and affectionate disposition. Unlike the common monkey, they are grave even to melancholy, are neither flokke nor mischievous, and, in a domesticated state, are capable of exhibiting the strongest attachment towards a kind owner. Acosta, in his "History of the West Indies," gives the following anecdote of a quata, one of the apecies of the genus: he says, "They sent the quata to the tavern for wine, putting the pot in one hand and the money in the other. They could not nearly went the noney out of his hand before his not possibly get the money out of his hand before his pot of wine was full. If any children met him in the street, and threw stones at him, he would put his pot down and cast stones among the children, till he had assured his way. Then would he return to carry home his pot; and, what is more, although he was a good bribber of wine, yet he would never touch it till leave was given him. The genus Ateles comprehends the following account. onoper of wine, yet he would never rouch it in leave was given him. The genus Ateles comprehends the following species:—1. Ateles paniscus, or quata; 2. Ateles marginatus, or chuve; 3. Ateles uter, or cayou; 4. Ateles Belsebus, or marimonda; 5. Ateles melano-

cheir; 6. Ateles aracknoides, or brown quata; 7. Ateles hypoxanthus, the mono or miriki; 8. Ateles subpentadactylus, or chameck.

dactylus, or chameck.

Amelies Nationaux, or National Workshoffs, a-tel'-è-ai adr-i-o-no. — Since the year 1845, it was the custom in France, during severe winters, or in times of distress caused by stagnation of trade, to open temporary wogsahops, in order to give employment to labourers who were out of work. These workshops were called Ateliers de Charité, until the year 1848, when the provisional government of the resulting reconned a year unmber of these establishments. year 1888, when the provisional government of the re-public reopened a rast number of these establishments, under the name of Ateliers Nationaux. They were under the control of a department called "The Commit-tee of the Government for the Workmen;" they were all, however, badly organized, and failed calamigonaly. The principle on which they were conducted was, that every workman should have a living provided for him on a fixed scale. The result was, that workthen soon left private employers and entered the national workleft private employers and entered the national workshops. The numbers who flocked in soon became alarming. More than 100,000 men enrolled themselves, and insubordination soon began to show itself. Danger was imminent, and the National Assembly ordered the dissolution of the Ateliers Nationaux; an act which became the pretext for the terrible insurrection which ensanguined Paris in June, 1848.

A TEMPO, or A TEMP, a-tem-po, in Mus., a term signifying 'in time; of similar signification with a battata, and, like that expression, seldom used but when the regular measure has been designedly interrupted. When there has been some short relaxation in the time, a temp or a tempo denotes that the performer must return to the original degree of movement.

must return to the original degree of movement.

A TERMO CIUSTO, in Mus., a term signifying in equal and just time; an expression generally applied to the manner of performing a steady sound movement,—a movement less directed to the feelings than to the judement, more scientific than impassioned.

judgment, more scientific than impassioned.
ATHARSHAN (See BRETLE and SCARBEUS.)
ATHARSHAN CREED, ülh-ä-nal'-shi-än, a formulary
or confession of faith, said to have been drawn up by
Athanasius, bishop of Alexandria, in the 4th century,
to justify himself against the calumnies of his Arian
enemies. That it was really composed by this father
seems more than doubtful; and modern divines generally concur in the opinion of Dr. Waterland, that it
was written by Hilary, bishop of Arles, in the 5th
century. It is certainly very ancient; for it had become so famous in the 6th century, as to be commented
upon, together with the Lord's Prayer and Apostics'
Creed, by Venantius Fortunatus, biship of Poitiers.
It was not, hawever, then styled the Athanasian Creed,
but simply the Catholic Faith. It is supposed to have It was not, hawever, then styled the Athanasana Creed, but simply the Catholic Faith. It is supposed to have received the name of Athanasius, on account of its agreeing with his doctrines, and being an excellent summary of the subjects of controversy between him and the Arians. The true key to the Athanasian Creed lies in the knowledge of the errors to which it was opposed. The Sabellians considered the Father, Son, and Mark Sabellians considered the Father Son, and and sabellians considered the Father Son, and and sabellians considered the Father Son, and and sabellians considered the Sabellia opposed. The Sabellians considered the Father, Son, and Holy Spirit as one in person; this was "confounding the persons:" the Arians considered them as differing in essence; this was "dividing the substance;" and against these two errors was the creed stance: and against these two errors was the creed originally framed. The most exceptionable part of the creed is what is termed the "damnatory clauses:"—"Whoseever will be saved, before all things it is necessary that he hold the Catholic faith; which faith except every one do keep whole and undefiled, without catholic faith of the contraction of the c except every one do keep whole and undeffled, without doubt he shall perish everlastingly. And the Catholio faith is this,—that we worship one God in Trinity, and Trinity in Unity, neither confounding the persons nor dividing the substance." This creed is appointed to be read in the Church of England on certain days; and, regarding the "dannatory clauses," the commissioners appointed in 1688 to review and correct the littery and the thick there there have been described. the liturgy, say that they "are to be understood as relating only to those who obstinately deny the sub-stance of the Christian faith."

ATHERISM, all-the-izm (Gr. a, without, these, God), a word of comparatively modern invention as applied to that system of belief which professes to discard the extraction of the contract of istence of a deity. Many persons, both in ancient and modern times, and on very various grounds, have had the name of atheist applied to them; but it may be

# Atheling

justly questioned whether any same man ever adopted such a principle. No doubt many men have repudiated altogether the ordinary ideas of the Deity, both as to his character, and as to the methods of establishing the proof of his existence; and in a comparatively ignorant age, or among a comparatively ignorant race of people, such persons would very likely be set down as atheists by those who did not understand their peoplis renets. Again, such atheists as those among peculiar tenets. Again, such athelets as those among the Greek philosophers, as Leucippus, Democritus, and Protagoras, who went mainly upon the assumption that they had no proper idea of such an existence, were not really so far from certain modern Christians as might be imagined. From Kant to Dr. Mansel, of Oxford, philosophers like Sir William Hamilton have maintained what is commonly called speculative atheritations. maintained what is combined year and speaked active attempts their opponents, who profess to hold on by the dogmatic view of the existence of Deity, and who believe they can demonstrate his being. Everybody at all acquainted with the question knows that no demonstrate in the property of the property o all acquainted with the question knows that no demonstration,—no è priori proof,—of such an existence is possible, inasmuch as no notion can be formed of a higher generality than infinitude, to serve as the major premiss on which this alleged syllogism can rest. And hence, while no demonstration of such a being can be offered, ample speculative proof of his existence can be inductively reached. Without doubt, vulgar prejudice has had much to do with the atheism of many convent thinkers. From Scoreta downwards, but the minent thinkers, from Socrates downwards; but the Frenchmen of the 18th century made a boast of this creed, and vaunted it openly in the streets, as well as advocating it secretly in the closet. The remark of Lord Bacon was quite true, that though a smattering of philosophy might lead a man into atheism, a deep draught of it will assuredly bring him back to the

driught of it will assuredly bring him back to the belief in a God and in a divine providence. Atheling, Etheling, or Etheling, ith'-ling (Sux. athel- or ethel-boren, noble-born), a term employed in the Saxon period of our history to denote a particular kind of nobility. The atheling was originally a nobleman who possessed a certain amount of free lands, and was thus distinguished from the nobleman who owed service to the king, or held his lands under servitude. As, however, the king's retainers gradually acquired a supremacy over the landholding freemen, it is probable that the title atheling was transferred from is probable that the title atheling was transferred from is promise that the title attheming was transferred from the one to the other. This title was also applied to the eldest son of the reigning monarch, or the heir-pre-sumptive to the throne, to whom some believe that the term was confined. Lands were usually given to the atheling while still in his minority; probably in order to give the athel dignity.—Ref. English Cyclopædia— Arts and Sciences.

ATHENEUM, ath-e-ne'-um (Gr. athenaion), in Antiq., a public place frequented by professors of the liberal arts, and where rhetoricians declaimed, and the poets read aloud their works. At Athens these aspoets read aloud their works. At Athens these assemblies first took place in the temple of Minerva (in Gr., Athene),—whence the name. The Athensum at Rome was founded upon the Capitoline hill, by the emperor Adrian. It was a school or college, furnished with a complete staff of professors for the several branches of study. Like its Athenian prototypes, this establishment was frequented by the Roman orators, poets, and other learned men, who there declaimed their compositions, the emperors themselves frequently honouring the assembly by their presence. At a subtheir compositions, the emperors themselves frequency bonouring the assembly by their presence. At a subsequent period, another celebrated athenaum was erected at Lyons. These institutions, generally, appear to have retained their high reputation until the 5th century. At the present time, the term has been revived as a name for certain establishments connected with learning, as well as for clubs and libraries. It is also the title of three weekly literary journals; one published in London, one in Paría, and one in Germany.

### Athwart

of England; upon the eastern coast of England, well as in certain parts of Ireland, they are also to met with. At Brighton the atherine is called the sa



ATREBINE

smelt; and in several market-towns of England when the smelt is unknown, the atherine is commonly sold under that name.

under that name.

ATHEBOSPZEMACEE, āth'e-ro-sper-mai'se-e, in Bot., the Plume Nutmeg family, a nat. ord. of dicotyledonous plants in the sub-class Monochlamydee. There are but three genera, namely, Atherosperma and Dorphoro belonging to Australia, and Laurelia to Chili. Only four species are known, and these are all handsome and fragrant trees. Each produces fruit, consisting of a number of schemia inclosed in the tube of the calvy, and having naviatant stries which have grown into and having persistent styles which have grown into feathery awns. The achieving of Laurelia have an odour very similar to that of the common nutmeg. Atherosperma moschata furnishes valuable timber, also an aromatic bark, which is used in some parts of Australia as a substitute for China tea.

tralia as a substitute for China ten.

ATHLYTES, āth-leets' (Gr. athletai), were those persons who, among the Greeks and Romans, contended for prizes (athla) at the public games, in boxing, wrestling, running, leaping, and throwing the disc. Unlike the agouistes, who only pursued gymnastic exercises as a means of improving their health and bodily vigour, the athleta devoted their whole lives to preparing for the contests at the public games. For these they were trained with the utmost care. They were constantly undergoing a course of the most several were constantly undergoing a course of the most severe exercise, in a gymnasium set apart for the purpose, under the superintendence of the gymnasiarch. An officer named the aliptus directed their diet, which, although regular in its nature, was enormous in quantity. They usually slept for a very long time. At first the athletes, when struggling for the prize, wore a girdle round their loins; but algerwards they contended in a nude state. Before commencing wrestling encounters, their bodies were covered with sand, that they might grasp each other the more firmly. In other games they were anointed with oil by the aliptus. An athlete who gained the prize at either of the four great public games,—viz., the Olympian, Istamian, were constantly undergoing a course of the most severe. an athete was gamed the brise a cluser of the tour great public games,—viz., the Olympian, Isthmian, Nemean, or Pythian, was received by the state to which he belonged with the greatest honours. A breach was made in the city walls specially to allow of his entrance in a chariot drawn by four white horses. his entrance in a chariot drawn by four white horses, On entering within the city, he was conducted to the temple of the presiding deity, where hymns were chanted in his praise. A successful athlete was absolved from the payment of taxes; often his status was set up in a public spot; and in battle he fought in a distinguished place. Athletes were, it is stated, introduced from Greece into Rome by M. Kulvins, at the alease of the Alease of the Takinn rear 186 M of They excelled. the close of the Ætolian war, 186 B.C. They speedily became highly popular; and, under the emperors, their contests were admired by the nation to a degree bordering upon passion. Under Noro an enormous number of athletes lived in Rome, where, however, they were hirelings, and lived separately, forming, by themselves, a distinct corporation. The athlete were an entirely different class from the gladiators. (See CLADIATORS.)

Among the Greeks there were no gladiators.

ATHWAET, a-thworf, in Mar, across the line of aship's course; as, "a fleet was discovered standing athwart our course,"—that is to say, steering across our way.

Athwart-hawse is the situation of a ship when she is many.

Atherina, &th'-e-rin (Lat. atherina), a gen. of fishes, formerly classed with the Mullet fam., but now separated from them. They rarely exceed six inches in lougth, and have a rather flat upper jaw. Some possess, but given the subject of the fight of a cannon-bull, very small teeth, while others are entirely toothless. all the known species have a silvery stripe on each state of from one ship across the line of another's All the known species have a silvery stripe on each to side of the body. In the Mediterranean they are very numerous, and they also abound on the southern coast from side to side, or in that direction.

#### Atlantes

ATLANTES, OF ATLANTIDES, &t-lan'-toes (Gr. Atlas),

ATLANTIDES.

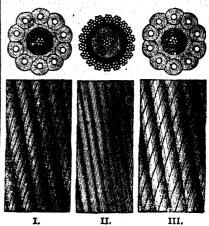
in Arch., a name given by the Greeks to male figures used instead of columns or pilasters to support entablatures. The name was derived from the idea of Atlas bearing the heavens on his shoul-ders. The Egyptians were in the habit of attaching colorsal figures of this kind to the columns of their temples, which probubly suggested the use of them to the Greeks. These figures are some-times called Telamones or times called Tenamones or Persians. In the modern architecture of Italy, At-lantes are frequently to be seen, supporting the en-tablature above the entrance of a great building. When female figures are made use of for the like

purpose, they are termed rides.) In Astron., the Caryatides. (See CARYATIDES.) In Astron., the name Atlantides is applied to the Pleiades, seven stars representing the daughters of Atlas, supposed to have been turned into a constellation after death.

have been turned into a constellation after death.

ANLANTIO TELEGRAPH, at-lön'-tik (Lat. atlanticus;
Gr. telos, far, distant, and graphein, to write).—
The success of various attempts to send messages
by electric agency through cables lying under water
for short distances, induced Professor Morse, of
New York, to suggest the possibility of uniting
England and America by a submarine cable, laid from
shore to shore throughout the Atlantic Ocean. In
1845, Mr. J. W. Brett registered an association, under
the name of the General Oceanic Telegraph Company,
to carry out the object above mentioned, and to connect England with the continent in various parts. The to carry out the object above mentioned, and to con-nect England with the continent in various parts. The latter part of his design was successfully accomplished in 1851, and public attention was, in consequence, again directed to the junction of England and America by similar means of intercommunication. Newfound-land had already been united to the mainland of America by submarine cable; and, in 1856, the Atlantic Tellegraph Company was formed with the design of Telegraph Company was formed, with the design of laying a cable between St. John's, Newfoundland, and Valentia, in Ireland, along the bottom of the Atlantic in its most shallow part, which had been pointed out for the purpose by Capt. Manry, and called by him the Telegraphic Plateau. Pecuniary assistance was guaranteed to the company by the respective govern-ments of Great Britain and the United States, and ments of Great Britain and the United States, and both powers agreed to furnish ships for taking out the cable and placing it in its destined bed. On Aug. 5, 1837, H. M. S. Agamemnon and the United States frigate Niagara, with the cable on board, commenced operations at Valentia. The cable broke twice, and the vessels returned to England after the failure of the second attempt. Another trial, in the month of June, second attempt. Another trial, in the month of June, 1858, was frustrated by a violent storm; but on the 29th of July, the parts of the cable in each vessel were united about the middle of the Atlantic, and the ships parted company, the Agamennon for Valentia, and the Niagara for Trinity Bay, Newfoundland. On Aug. 5 both ressels had arrived at their destination without railed to and a phase of summing the street three controls. accident, and a chain of communication was thus completed between the great commercial nations of the Eastern and Western hemispheres. Unfortunately, Eastern and Western hemispheres. Unfortunately, early in September there was a perceptible difficulty in the transmission of signals, which continued to increase until they became totally unintelligible, and the cable soon afterwards became entirely usaless. In 1860 a new company was formed; the Great Eastern was engaged to lay down 2,300 miles of wire, and upon July 15, 1865, the vessel sailed from the Thames for Valentia, under the command of Captain, afterwards Sir James, Anderson. The Great Eastern commenced paying out the cable, but telegraphic communication between Valentia and the vessel ceased on August 2. This interruption was from the Thames for Valentia, under the command of Captain, afterwards Sir James, Anderson. In the cable is 37,163 knots, weighing 4,727 tons; of the telegraphic communication between Valentia and the vessel ceased on August 2. This interruption was

due to defective insulation. The sparatus on board the Great Eastern for raising the wire proving insuf-ficient, the vessel returned to the Medway, where it anchored on Aug. 19, 1865. In July of the follow-ing year a fourth and successful attempt was made by the Great Eustern, and a new calle was laid between Valentia and America. After completing this task, the vessel proceeded to hall up the lost cable of 1865. On Sept. 2, 1866, the oable was grappled, after ten unsuccessful attempts, the bight brought on board the



Great Eastern, a splice effected, and, sbortly afterwards, telegraphic communication by means of two wires was carried out between this country and America. The dimensions and weights of the three Atlantic cables are as follows:—First Atlantic. Length, as laid, 2,022 knots; copper conductor 7-wire strand, weighing 107 lb. per knot, diameter 0.093 in.; covered with gutta-percha, weighing 200 lb. per knot, diameter 0.738 in.; served with tanned hemp and covered with 18 strands of seven bright charcoaliron wires, 0.028 in. diameter; total diameter of cable, 0.62 in.; weight of cable in air per knot, 21.7 cwt.; in water, 18:3 cwt. Second Atlantic.—Length when corplete in 1866, 1,806 knots; copper conductor 7-wire strand, weighing 300 lb. per knot, diameter 0.114 in.; covered with gutta-percha and Chatterton's compound, weighing 400 lb. per knot, diameter 0.464 in.; served with wet tanned hemp covered with ten bright steel wires, each inclosed in fire tarred Manilla hemp strands,—diameter of each wire, 0.036 in.; diameter of strand, 0.28 in.; diameter of cable, 1.125 in.; weight of cable per knot, in air, 35° cwt.; in water, 14 cwt. Third Atlantic.—Length as laid, 1,858 knots; similar to 1865 cable, except that the ateel wires were galvanized and the Manilla strands were not tanned, but left white; weight in air, 31 cwt.; in water, 14¢ cwt.; breaking strain, 8 tons. Appended are three drawings made to scale, which show the relative proportions of the three Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic cables. In July, 1869, a cable across the Atlantic Great Eastern, a splice effected, and, shortly after-12 ton per knot, in water its specific gravity is about 15 cwt.; and in regard to strength it will bear a strain

ATLAS, ill-lis, a name given to any number of maps collected in the form of a volume, probably because old works of the kind had a figure of Atlas bearing the world on his shoulders engraved on the title page Boucher imagines the name to be derived from the

Boucher imagines the name to be derived from the German atlass, satin, because maps were usually printed on soft paper with a glossy surface like satin.

Allas, in Anat., is the name of the first vertebra, so called either from the Greek verb atlac, I sustain, or from Atlas, who was fabled to support the world upon his shoulders. It differs from the other vertebras upon his shoulders. It differs from the other vertebres in having its body small and thin, and its foramen very large, being in form somewhat like a ring. It is connected above with the condyles of the occipital bone, and receives the tooth-like process of the second cervical vertebrs from below, the former admitting of moving the head up and down, the latter from side to

ATMIDOMETER, it-mi-dom'-e-ter-(Gr. atmos, vapour; metron, a measure), an instrument, the invention of Mr. Babington, used to ascertain by measurement the evaporation from water, snow, or ice. Its construc-tion is as follows:—Two hollow copper or glass bulbs tion is as follows:—Two hollow copper or glass bulbs are connected by a contracting neck, the lower bulb being weighted by shot or mercury. Upon the upper bulb is placed a scale marked to show grains and half-grains, above which is a small metal pan. On immersing this instrument in water, and distilled water being slowly poured into the pan, it is made to sink until the zero of the graduated atem is brought to a level with the cover of the vessel in which the water is contained. This stem rises as the water in the pan evaporates, the amount of evaporation being marked on the scale. ATMOLYBE. di-molif-zer (Gr. atmos. vapour: lusis.

ATMOLYSER, il-mo-li'-zer (Gr. atmos, vapour; lysis, a loosing), an instrument devised by Mr. Graham, the master of the Mint, to illustrate the application of diffusion through a porous septum as a practical analytical nusion through a porous septum as a practical analytical method of separating mixed gases. The apparatus is thus constructed:—The stalk, about two feet long, of a Dutch tobacco-pipe, having an internal diameter of about 2:5 millimètres, is fixed by means of perforated corks within a glass or metallic tube some inches in length, and about an inch and a half in diameter (w, i), as in the construction of a Liebig condenser. Another quill tube (v) is inserted in one of the end corks affording the means of communication between corks, affording the means of communication between the annular space and the vacuum of an air-pump. The external surface of the corks and those portions of the pipe-stem which project outside the tube should be coated with varnish, to render them impermeable to air. A vacuum is next obtained within the large outer tube, and the mixed gas is then made to enter



and pass through the porous tobacco-pipe. A portion of the gas is drained off through the porous tube and or the gas is trained on through the porous tine and pumped away, whilst snother portion passes on through the other extremity of the clay tube, where it may be collected. The stream of gas diminishes as it proceeds. The lighter gas is drawn most largely into the vacuum, leaving the denser gas in a more concentrated state to pass away through the exit end of the clay tube. The more slowly the mixed gas is moved through the tube, the larger will be the proportion of light gas which has been drawn off into the vacuum, and the more concentrated will the heavy gas become. The rate of flow of the mixed gas can be regulated by discharging it from a gas-holder or drawing it into a gas-receiver under ascertained pressure. In his communication to the Royal Society, Mr. Graham gave the following, among other results:—A mixture of 1 measure of cygen and 2 of hydrogen was passed at the rate of cygen and 2 of hydrogen was passed at the rate of giltres per hour; 0.45 litre of the mixed gas was collected. Before traversing the atmolyser it contained 0 39.3, H 66.7; after traversing the apparatus it contained 0 90.7, H 9.3. The result of this experipumped away, whilst another portion passes on through

ment was very striking, as the mixture before traversing the tube was explosive, but after its passage through the porous aperture it cassed to be so, and a lighted taper burnt in it as in pure crygen. (See Diraverox or Casses).—Ref. Graham On the Molecular Mobility of Guese, published in the Transactions of the Royal Society for 1863.

ATMOLYME, M. mol. is for, atmost veryour, here, a

Royal Society for 1863.

ATHOLYSIS, itt-mol'-s-sis (Gr. atmos, vapour; lysis, a loosing), a method of separating the constituent gases of a compound gas—as, for instance, atmospheric air—by causing it to pass through alporous material such as graphite. It was first made known by Mr. T. Graham, master of the Mint, in 1863.

ATHOMERER, itemon'-s-ter (Gr. atmos, vapour; metron, a measure), an instrument for measuring the quantity of water evaporated under given circumstances. If it were not for the variety of causes which influence the process of evaporation at the earth's surface, an atmometer would be a simple instrument. face, an atmometer would be a simple instrument. A lace, an atmometer would be a simple instrument. A quantity of water, after being weighed, would have to be exposed in a measured vessel to the action of the atmosphere; the difference in weight, after the experiment, would give the amount of evaporation. But meteorological and other causes so affect vaporous exhalations at the surface of the earth, that no accurate atmometer has hitherto been constructed.

Amosphere, it mos-feer (Gr. atmos, vapour, and sphaira, sphere), the name given to the gaseous envelope of the earth. It partakes of the rotatory motion of our planet, and would remain unmoved relatively to terrestrial objects, were it not for local circumstances, which produce winds, and are constantly disturbing its equilibrium. The composition and most of the chemical properties of the atmospheric ocean are described mical properties of the stonespheric ocean are described in another portion of this work (see AIR); but some additional particulars may be given here. It has been calculated that the atmosphere contains 2,551,586 billions of pounds of oxygen, and that the yearly consumption of this single gas by men and animals (see RESPRATION), together with the quantity abstracted in the ordinary processes of combustion, must amount to two and a quarter billious of pounds. Thus, in a hundred years, the consumption of exygen would only reach 220 billions of pounds,—that is, not even the ten thousandth part of the whole. Carbonic acid exists in the atmosphere in very small proportion. At ordinary elevations there are only about two gallons of this gas in every 5,000 of air, or around part of the whole. It increases, however, as we ascend; so that, at heights of 8,000 or 10,000 feet, the proportion is nearly doubled. By the second increased quantity is very small; and yet the presence of carbonic acid in the atmosphere is essential to the existence of vegetable life on the surface of the earth. (See VEGETABLE KINGDOM.) surface of the earth. (See VEGETABLE KINGDOM.)
Carbonic acid is being continually produced by the
respiration of animals, the processes of combustion,
and the decomposition of organic substances; so that and the decomposition of organic substances; so that there is no danger of the supply required by growing plants ever falling short. Boussingault has estimated that the quantity of carbonic acid produced in Paris every twenty-four hours amounts to nearly a hun-dred and six millions of cubic feet. The atmosphere, as a chemical agent, acts principally by oxidizing bodies exposed to its influence, more especially metals. The amount of animonia, one of the products of the decomposition of animal substances, averages from 1 part to 6 in every 10,000 parts of air. Sulphuric acid and sulphuretted hydrogen, products of the combustion of coal, are found in proportions varying from 0 to 42 parts in 10,000. Hydrochloric acid is also found of moisture in the sir increases its chemical effect. It varies according to weather and locality. The chemi-cal influence of the air is seen in the disintegration of the hardest granitic and felspathic rocks, which gradually crumble away under its action, forming the kaolin or China clay of the potter. The combined effects of or Luma ctay of the potter. The combined effects of air and moisture on magnesian limestone are wofully apparent in the condition of the new Houses of Parliament. Wood decays when exposed to the air by slow combustion at ordinary temperatures, or eremacausis, as it is called by Liebig. A certain amount of moisture and heat is necessary in this case, as perfect dryness and a temperature below freezing-point arrest this slow oxidation or decay. Linen damped and

exposed to the air gradually leass weight; the carbon of the fibre uniting with the oxygen of the air to form carbonic acid. After a time, the fibres become so disintegrated, that they fall to powder, or become rotten. Motals for the most part rust, or become converted into oxide, in moist air; giving rise to precisely the same compound, as if they were burnt in the fire. Iron is easily rusted; hence it is galvanized, —i.e., covered with a coating of zime or tin, these metals having much less affinity for oxygen. The decay of iron is much sided by the presence of another metal. Thus the lead by which railings are attached to stonework sets up a galvanic action as soon as it is wetted; Thus the lead by which railings are attached to stone-work sets up a galvanic action as soon as it is wetted; the result being, that the iron decays very quickly at the point where it joins the lead. The action of the air on metallic paints containing lead is very marked; they become speedily tarnished by the absorption of sulphur. Even glass is affected in this way, lead-glass especially becoming covered with a film of oxide or sulphide, from prolonged exposure to air and damp. Gold, aluminum, and one or two other metals, remain metarnished by exposure is in the liter seen be. untarnished by exposure to air; but silver soon be-comes covered with a film of sulphide. From the above facts, the reason for gilding, plating, and painting metals and wood is made apparent. The painting metals and wood is made apparent. And atmosphere exercises an immenso pressure on the whole surface of the earth. At the ordinary sea-level this pressure equals nearly 15 lbs. on every square inch. On ascending above the sea-level, the pressure dimi-On accending above the sea-level, the pressure diminishes; and, on descending below,—in a coal-mine, for instance,—it increases. The atmospheric pressure was first determined in 1643 by Torricelli, a pupil of Galileo. (See BAROMETEE.) By virtue of the expansive force of air, it might be supposed that the molecular world covered color with the molecular world covered colors. sive force of air, it might be supposed that the non-cules would expand indefinitely into space; but, in proportion as the air expands, the expansive force decreases, and is further weakened by the low temperature of the more elevated regions; so that, at a certain height, an equilibrium is established between the expansive force which separates the molecules and the action of gravity which draws them towards the earth. It is therefore concluded that the atmosphere earth. It is therefore concluded that the atmosphere is limited. From the weight of the atmosphere and its gradual decrease in density, and from the observation of certain phenomens of twilight, its height has been estimated at from thirty to forty miles. At that height the air is extremely rarefled; and, at the height of sixty miles, it is assumed that there is a perfect vacuum. Recent observations made by Liais, a Franch agant in the two large to have because. a French savant, in the tropical zone, have, however proved that the atmosphere extends to a much greater height,—in fact, to between 198 and 212 miles. The pressure of a column of air upon the upper surface of a body is balanced by the expansive force of the air acting upon the under surface. Thus, the weight of the air supported by the hand can only be made sensible by placing the hand can only be made sensible by placing the hand over the mouth of the open receiver of an air-pump, and removing the sustaining air.

With a piece of bladder



MAGDEBURG HEMISPHERES.

the receiver, the crushing force of the atmo-sphere may be illustrated in a very striking manner. As soon as a tolerable vacuum is produced in the receiver by working the air-pump, the bladder is depressed by the weight of the atmosphere above it, and finally bursts with loud report, caused by the sudden entrance of the air. Of the many forms of apparatus which have been devised to demonstrate the existence of the atmospheric pressure, none equal the Maqde-

tied over the mouth of

which are ground to fit closely, and well greased. One of the hemispheres is provided with a stopcock, by which it can be screwed on the air-pump or to an ex-heasting syringe, and the other is provided with a handle. As long as the hemispheres contain air they can be separated without any difficulty, for the external can be separated without any dimensity, for the external pressure of the atmosphere is balanced by the elastic force of the air in the interior; but when the internal air is pumped out, the hemispheres cannot be separated without a powerful effort; and, as this is the case in whatever position they are held, it follows that the atmospheric pressure is transmitted in all directions. atmospheric pressure is transmitted in an uncettons. The average pressure at the sea-level is usually taken at 14.6 lbs. avoirdupois on the square inch, or just sufficient to support a column of mercury 30 inches in height; hence a column of 60 inches will be equal to two atmospheres, a column of 90 inches to three, and so on. It is customary to estimate the four of steam and other fluid pressures by dimensioner—that is in and other fluid pressures by atmospheres,—that is, in round numbers, at the rate of 15 lbs. per square inch for every atmosphere. (For information respecting other points connected with the atmosphere, see Airs, FLUID, ACOUSTICS, METEOROLOGY, DRW, RAIR, TEMPERATURE, WIND, AREMOMETER, BAROMETER, HYGROMETER, RAIN-GAUGE, THREMOMETER.)—Ref. Ganot's Physics.

ATMOSPHERE OF THE PLANETS.—From a great variety of analogous circumstances proving the common origin of the earth and the other heavenly bodies, there is strong reason for believing that many, if not all, of the planets are surrounded with gaseous envelopes or at-mospheres. It is not, however, assumption alone that leads to this opinion; the telescope reveals to us such changes in the appearance of many of the planets as can only be accounted for by the fact that they have can only be accounted for by the fact that they have atmospheres. Mars, Jupiter, and Saturn have, in this way, been proved to possess a transparent atmosphere, varying at different times and places, like that of our own planet. Upon the earth, air is essential to the existence of living beings, and there is a probability almost amounting to a certainty, that the other worlds revolving round our sun have inhabitants, whose exist-tence is supported by an atmosphere equilar to existrevolving round our sun have inhabitants, whose existence is supported by an atmosphere similar to our own. The varied distances of the planets from the sun, and the vast difference in the amount of heat received by each, present the greatest difficulties when we try to imagine the inhabitants of these far-off spheres. Neptune only receives \$\frac{1}{2}\sigma \text{That}\$ of the heat which we receive, while Mercury and Venus must receive much more than we do. However, it has been argued by scientific philosophers, that the diathermanous nature of the carth's atmosphere is such, that it regulates the amount of heat transmitted to us from it regulates the amount of heat transmitted to us from the sun; the temperature being in proportion to the the sun't the temperature being in proportion to the height of the timosphere. Similarly they argue, that according to the height or depth of the atmospheres surrounding the other planets, their mean temperature might be the same as our own. Mr. Hopkins, of Cambridge university, calculated, that if the planet Mars had an atmosphere of 15,000 feet higher than that of the earth, the average temperature would be similar to ours; and if the atmosphere of Venus was 20,000 feet less than that of the earth, the same effect would be produced. Schroeter calculated that the atmospheres of Ceres and Pallas were 668 and 465 miles, respectively, in height. (See PLANERS and RADIANT HEAT.)

ATMOSPHEBICAL CLOCK. (See CLOCK.) ATMOSPHERIC ELECTRICITY. (See ELECTRICITY, ATMOSPHERIC.)

ATMOSPHERIC.)

ATMOSPHERIC ENGINE, ill-mos-fer'-ik, an engine in which the piston is raised by the force of the steam which is admitted at the bottom of the cylinder. As soon as the piston reaches the top of the cylinder, which is open, the steam is condensed, and the piston is forced down by the pressure of the atmosphere. These engines are but rarely used in the present day.

ATMOSPHERIC RAILWAY.—Several plans have, at various times, been devised for producing locomotion by means of atmospheric pressure. Most of these.

by means of atmospheric pressure. Most of these, when brought into action, have been found to be commercial failures. The most successful of these Surg kemispheres, invented by Otto Guericke. This well-known arrangement consists of two hollow copper known arrangement consists of two hollow copper knispheres, of a to 42 inches diameter, the edges of years by Messrs. Clegg and Samuda, but eventually

abandoned in favour of steam. The line was very steep in some parts, and, one terminus being much higher than the other, the carriages performed the return journey by the force of their own gravity. The method of working was as follows:—A tube 15 inches in diameter was laid the whole length of the line. in diameter was faid the whole length of the line. Along the top of this tube was a slit covered by a flap of leather, strengthened by two pieces of iron. Within the tube was a piston, to the centre of which was fixed a piston-rod. To the end of this rod farthest from the piston was attached the connecting-bar of the carriage, which passed npwards through the slit in the tube. The flap being opened at a distance of say four fect from the piston, did not interfere with the air-tightness of the portion of the tube before the piston. To the connecting-bar of the carriage was fixed a little rollow which closed the flan as soon as the connecting-To the connecting-bar of the carriage was nice a little roller, which closed the flap as soon as the connecting-bar passed, and a heater at the same time glided over the flap, melting the composition of wax and tallow with which it was soaked, rendering the tube once more air-tight for another carriage. The piston was set in motion by exhausting the air before it with a powerful pump worked by a steam-engine. A line was also laid between London and Croydon; but it has and the week London and Croyon; but this been long abundoned. A scheme is alloat for the conveyance of parcels by atmospheric pressure. In this case, the tube is intact, and the box containing the articles to be forwarded is attached to the piston. The great objection to this mode of locomotion is the great objection to this inductor technical is see obvious waste of power, the same stationary engine being kept at full work whether the load is large or small. The liability of the flap or valve to get out of order was very great, a small stone or bit of stick falling into it during the passage of the train being enough to prevent a vacuum being formed when next required. The advantages, however, are also great. The impossibility of collisions, the ease with which The impossibility of commons, the case with which gradients are traversed, obvisting the necessity of cuttings or embankments, are benefits that are scarcely neutralized by the disadvantages stated.

ATMOSPHERIO STOMES. (See AEROLITES.)

ATOMIC TREORY, ATOMIC WEIGHT, intomicik (Gr.

a, not, temno, I cut) .- Every body is supposed to cona, not, cents, of turknown size, form, and weight, which being infinitely hard, cannot be further subdivided. The atoms of elements are simple, those of compounds are compound. No atom has ever been seen, even by the most powerful microscopes, although particles of the control of the contro bodies less than survey of an inch in diameter have been discerned by their sid; the forms of atoms are, therefore, unknown. Although the actual size and weight of the ultimate atoms of bodies cannot be ascertained, it is easy to discover their relative size and weight. For instance, it is found by experiment that weight. For instance, it is found by experiment that one grain of hydrogen combines with eighty grains of bromine to form a definite compound, and never in any other proportion; it is therefore supposed that the number of atoms of each body is the same, but that the weight of each atom is as I to 80. This is borne out by the fact that bromine is exactly 80 times as heavy as hydrogen, a cubic inch of one uniting with one cubic inch of the other. The numbers and 80, therefore, represent the weight of the atoms or the atomic weights of these bodies; and it follows that 81 is the atomic weight of the compound formed by their union. These numbers are also termed the chemical equivalent or combining proportion of these substances. All the other elements have their combining proportions or adomic weights, and are subject to the same laws as hydrogen and bromine. It often happens that double, troble, and quadruple atoms of one ele-ment will unite with a single atom of another element to form a compound; for instance, the following compounds of mitrogen and oxygen occur :-

> Nitrogen, 14 grains; Oxygen, 8 grains. 16 ... 2.7

24 14 22 ... 24 \*\* 32 40 14 99 14 83

Here we find one atom of nitrogen uniting with a single, double, treble, quadruple, and quintuple atomatoxygen, and merer in any other proportion,—N. 15 to O. 6, or N.14 to O. 7, for example. This is called the doctrine of defimite proportions, and is a consequence of the theory of

stoms of a constant size and weight laid down above. It was first put forth by John Dalton, of Manchester. It has been said above, that the atoms of the essue body are of constant size; but it happens in several sizes that the atoms of different bodies are of different sizes. Thus, though it is found that one cubic inch of hydrogen unites with one cubic inch of hydrogen unites with one cubic inch of hydrogen unites with one cubic inch of carbon and iron unite in chemical combination. There is great diversity in the relative sizes of elementary atoms, those of six in the relative sizes of elementary atoms. eity in the relative sizes of elementary atoms, those of carbon being only half the size of those of iron. The weight of an atom of carbon would be 6, and that of an atom of iron would be 28; but the quantity of carbon would only take up half the space of the quantity of iron. It has been found that bodies with the same of iron. It has been found that bodies with the same combining volume sures strongly in their properties. Iodine, chlorine, and bromine, are very similar in their reactions; and there are several other groups of elements formed on the same basis. (See Around Volume.) To sum up, atomic weight is the relative weight of the atoms of bodies, or, which is the same thing, the proportion in which they unite. Reasoning on this theory, tables have been constructed of the atomic weights of all the elements, the atomic weights of all the elements, the atomic weights atomic weights of all the elements, the atomic weights of compounds being evidently the sum of the stomic weights of their constituents. Hydrogen has been taken as the unitary body by English chamiets, from being the lightest of all known substances. The continental chemists have taken 100 parts of oxygen as the standard number. This latter arrangement, by increasing the figures in each number, renders it much ess convenient to work with the continental than with the English scale.

Atomic Weights, Combining Proportions, or Chemical Equivalents, of the Elements.

Name.	Hydrogenanl.	Oxygen=100
Aluminium	13.672	170.9
Antimony	129.03	1612.9
Arsenio		937.5
Barium	68-64	859'03
Bismuth	212.86	2050-75
Boron		196-2
Bromine	79.97	999.62
Cadmium	55 74	696.76
Coesium		1605
Calcium		251.31
Carton		75
Cerium		575*
Chlorine		443.67
Chromium		328-38
Cobalt		365 65
Copper		395 6
Didymium		600
Erbium		000
Fluorine		237:5
Glucinum		87.12
Gold		1229 16
Hydrogen		12.5
Ilmenium		75.0
Iodine		1585-99
Iridium	98 56	1232-08
		350.5
Iron		990.9
		1294 64
		61 66
Lithium	6.53	158 14
Magnesium	12.65	344 68
Manganese		1251 29
Mercury	100:10	
Molybdenum		<b>696 1</b>
Nickel		<b>3</b> 69 33
Niobium		175100
Nitrogen	14.	175'08
Osmium	99.41	1242 62
Oxygen	8.	100
Palladium	53 24	665.47
Phosphorus		400 8
Platinum	98 56	1232:08
Potassium	39.96	497
Rhodium	52.16	651 96
Rubidium		1067
Ruthenum		651 39
Selenium		495-28
Silicon	21.86	267
Silver	109.0	2850*

 	S. O.		 -	 

Tromio Actinio				
Sodium	22.97	287:17		
		548.02		
Sulphur	16	200.0		
Sulphur Tantalum				
Tellurium	64.08	801-76		
Terbium	- T- T-			
Thorium	59:50	743-86		
Tin	58.82	735 29		
Titanium	24.12	301.55		
Tungsten	94 64	1183-3		
Uranium	60.0	750 0		
Vanadium	68-46	855.84		
Yttrium		7-1-1-1		
Zinc	32.52	400.59		
Zirconium	83.58	419.73		

Those elements with no numbers against them are as yet too rare in their occurrence to have had their yet too fare in their occurrence to have nad their atomic weight properly investigated. The above numbers, or equivalents, as they are generally termed, for the sake of shortness, have been determined with almost mathematical accuracy by various chemists of celebrity. When once a standard was fixed on, it was easy to determine the equivalents of other elements, by uniting a definite portion of the standard substance with that whose equivalent was sought, and weighing the result. Thus, I grain of hydrogen was exploded the result. Thus, I grain of hydrogen was exploded with, say, 13 of oxygen. A certain portion of the oxygen united with the hydrogen to form water, another portion remaining uncombined. On weighing the water, it was found to weigh 9 grains, showing that the equivalent or combining proportion of oxygen was 8, which was further confirmed on weighing the uncombined oxygen. Analysis, as well as synthesis, was also used to determine or confirm equivalents. One also used to determine or confirm equivalents. hundred grains of water were decomposed by voltaic electricity, and the resulting ovrgen and hydrogen weighed, the amounts being found to be, hydrogen 11·111 grains, oxygen 88'889 grains. The accuracy necessary in these determinations is so great, that the most eminent chemists shrink from engaging in these researches, although there are several elements.—

most eminent chemists shrink from engaging in these researches, although there are several elements,—boron, for instance,—the equivalents of which are acknowledged to be not quite correct.

ATOMIC VOLUME.—Atomic volume is the relative size of the combining proportions or atoms of bodies, just as atomic weight is the relative weight of their combining proportions or atoms. It is determined by dividing the atomic weight by the specific gravity. As the principal researches on atomic weights have been made in Germany, the oxygen standard is generally used in calculating them. As before stated (Atomic Weights), substances fall into several well-marked groups, possessing analogous properties, and giving groups, possessing analogous properties, and giving groups, possessing analogous properties, and giving isomorphous compounds. The following table will be sufficient to show this fact:—

	Equiv. 0 = 100	Atom. vol.	Sp. Gr.
Cobalt	369	44	8.39
Iron	350	44	7.95
Nickel	369	44	8.39
Iridium	1232	57	21.6
Osminm		57	21.8
Platinum	1232	57	21.6
Gold	2458	128	19.2
Silver	1350	128	10.53
Tellurium	800	128	6.25
Bromine	1000	320	3.12
Chlorine	443	320	1.38
Iodine	1587	320	4.95

It has been shown by Kopp that those elements which are isomorphous possess the same atomic size. This is true of numerous isomorphous compounds. Sulphate of magnesia and sulphate of zinc crystallize in the same forms, and have the same atomic size, although the atomic size of magnesium and zinc are different. The mysterious relations existing between the atomic volumes of different compounds and elements has lately received particular attention from many eminent chemists, great light having been thrown on the subject but the standard of the s by the researches of Kopp, Schröder, Felhol, Playfair, and Jonie.

ATONEMENT, a-tone'-ment, is a term derived from the old English verb to atone, ...e., to reconcile; and hence atonement, ...e., at-one-ment, ... denotes the being reconciled or agreed. In Theol. it is the reconcile-160

# Atropaces

ment of God with man, by virtue of the death of Christ. According to the Articles of the Church, the Son, one in substance with the Father, took upon him the nature of man, becoming very God and very man, "truly suffered, was crucified, dead, and hurled, to reconcile his Father to us, and to be a sacrifiee, not only for original guilt, but also for actual sins of men." Neither the nature nor limits of the present work admit of our neiting the different views that have been held by divines on this subject, or the numerous linely-spun theories to which it has given rise. They are wiser who hold with Bishop Butler, when speaking of the efficacy of Christ's sacrifice to secure the pardon of sin, says,—"How and in what particular way it of sin, says,—"How and in what particular way it had this efficacy there are not wanting persons who have endeavoured to explain; but I do not find that Scripture has explained it."

ATONY, at-o-ne (Gr. a, not, and tonos), tone), is a term used in Med. to denote deficiency in power or

term used in sted to denote demonery in power or tone, generally applied to muscular power.

ATRIP. (See ANCHOR.)

ATRIUM, ai'-tri-um (Gr. aithrios, exposed to the air), the entrance-hall and most splendid apartment of a Roman house. It consisted of a large covered court, with an opening in the centre of the roof, termed the complavium, through which the rain-water descended into a cistern let into the floor beneath. It was the into a clatery let into the noor beneath. It was the most highly decorated spartment in the whole house. Upon the walls were drawings representing incidents from the sacient mythology, surrounded by borders formed of elegant arabesques. Even the floors were frequently enriched with pictures executed in mosnic. The owner of the house have received his mounting The owner of the house here received his morning visitors; here the mistress superintended the labours of her female slaves, whilstengaged in weaving or other occupations. The temples, also, had atria, where the senators and others sometimes held meetings.

(See HOUSE, ROMAN).

ATROPA, ā-tro'-pā (Gr. Atropos, the name of one of the Fates), in Bot., a gen. of plants, formerly included in the ord. Solunacea, but now regarded as the typical in the ord. Solunacea, but now regarded as the typical gen. of a nat. ord. to which the name Atropacea has been given. The most important species is A. belladonna, the common Dwale, or Deadly Nightshade. This plant is a native of Greece and Italy, and also indigenous to Britain, but not common. It is perential and groups in bedges and waste grounds on a indigenous to Britain, but not common. It is perennial, and grows in hedges and waste grounds on a calcareous soil, but is only net with in a comparatively few localities. It blossoms from June to August, the flowers being about an inch long, drooping, bell-shaped, and of a lurid purple colour. The fruit is a berry of a shining volet black colour when ripe, about the size of a small cherry. The berries have a most tempting appearance, and children have frequently been poisoned by them. They are nowefully reproting been poisoued by them. They are powerfully narcotte; and one of the first symptoms of their deadly action and one of the first symptoms of their veant actions on the human frame is an appearance of the most besotted drunkerness. The dried leaves, or an infusion of the leaves, will act in a similar manner. Even a small dose causes an extravagant delirium, which is usually of an agreeable character. The delivium is sometimes accompanied by excessive and uncontrol-lable laughter, sometimes by excessive talking, but occasionally by a complete loss of voice. The state of mind sometimes resembles somnambulism, as in the case of a tailor, who, for fifteen hours, was speechless and insensible to external objects, and yet went through all the operations of his trade with great vivacity, and moved his lips as if in conversation. The best antidot to the virulent effects of this poison is vinegar, when promptly administered; but, if practicable, the stomach-pump should be at once used. When death ensues from its effects, the body soon putrefies, and swells in a remarkable manner, being covered with livid spots; and blood sometimes exudes from the mouth, nose, and eyes. Extract of bellacase of a tailor, who, for fifteen hours, was speechless from the mouth, nose, and eyes. Extract of bella-doma is employed to dilate the pupil of the eye during surgical operations, to allay pain and nervous irritation, and as an antispasmodio. It is to be feared that it is a common ingredient in specifics for sparkling eyes sold by perfumers. The active principle of the plant is the alkaloid atropia.

ATEORACEE, &-tro-pay-se-e, in Hot., a nat. ord. of dicotyledonous plants, of the sub-class Corollifore. The thirty-eight genera included in this order were

## Atrophy

separated by Miere from the Solonaces and Screphulariaces. The species are very numerous, and abound in tropical regions; but some are found in most parts of the world. Many have powerful narrotte parts of the world. Many have powerful narrotte properties, as, for instance, the tobacco-plant, the thornapple, heubane, deadly nightshade, and the mandrake, (See NICOTIANA, DATUBA, HYOSCYAMUS, ATEOPA, and

MANDHAGORA.)

MANDRAGUAL.
ARBORHY, at roofs (Gr. a, not, and tropks, nourishment), in Med., denotes a wasting, from deficient nutriment, either of a part or of the whole body.
In order to the maintenance of the healthy state of In order to the maintenance of the healthy state of the body or of any of its organs, a certain supply of nutrition is required to meet the waste that is constantly going on. When, from any cause, the supply of nutrition is not able to meet this waste, the natural dimensions of those parts are reduced. In a healthy condition of body, an exact balance is maintained between the waste and the supply; but in every morbid accidition this belience is more or less disturbed, in between the waste and the supply; Dut in every mod, in condition this balance is more or less disturbed, in consequence of which the whole body, or certain parts of it, receive too little or too much nourishment. first state, from whatever cause it arises, is termed atrophy, the latter hypertrophy. Atrophy may thus arise from a rast variety of causes. It may be occasioned by merely withholding the necessary supply of nutritions food, without any actual disease. Among the diseases capable of producing atrophy, the most common are those of the digestive organs, by which the aliment is taken up and prepared for assimilation.

Disease of the organs of assimilation may produce atrophy as effectually as disease in the primary organs of digestion. A frequent instance of this is in consumption, when the lungs become so diseased as not to be able to receive a sufficient quantity of air. Atrophy may result also from a want of activity in an organ, or in the whole body; so that when the nutri-tive particles are conveyed to them in the blood, they have not power to appropriate a sufficient quantity of them. When the vital activity of an organ is small, the them. When the vital activity of an organ is small, the nutritive particles are taken up slowly and languidly; while the affinity existing between them being also weak, they are sooner removed by the process of sborption than in health, and the parts thus circumstanced are rapidly wasted. Hence a due supply of nervous stimulus is necessary to the vital activity of an organ; while the cessation of action in any organ is invariably followed by atrophy. The first change that takes place in an atrophical organ from whethere. that takes place in an atrophied organ, from whatever cause, is diminution of the quantity of blood sent to cause, is diminution of the quantity of blood sent to it; and next to this, and chiefly owing to it, is greater paleness of colour. Subsequently, the organization becomes more completely changed; so that frequently all traces of its original conformation are lost, and, in some cases, it at last disappears altogether. In all cases atrophy arises from the diminution or perversion of the vital energies, generally the former; and hence, by exciting the natural vital energies of an organ, we tend to remove atrophy. In order to its cure, it is necessary to discover in what organ or organs the deficiency or perversion exists. The discovery of this is often difficult, and the removal of it, when discovered, is often more difficult. is often more difficult.

ATROFIA, ATROFINE, d-tro'-pi-n, a vegetable alka-loid found in the deadly nightehade (Atropa bella-donna), and the seeds of the Datura Stramonium. It donna), and the seeds of the Datura Stramonium. It is extracted by adding sulphuric acid to a strong decoction of either plant; filtering, saturating with potash, and dissolving the precipitate, which is the atropia, in hot water, from which it crystallizes in long silky needles. The preparation of the alkaloid causes a peculiar dilatation of the pupils of the eyes, which continues for several hours. It is one of the most violent aerid poisons known, the only antidote being a vigorous and immediate application of the stomachnumn, ametics being utterly useless, from the paralyzed

### Attainder

issues at the discretion of the judges of a court of record against a person, for some contempt, either actual or by disobeying its order, for which he is committed. It may be awarded by them upon a bare suggestion, or on their own knowledge, without any appeal, indictment, or information. The cases in which it is issued are where witnesses do not appear on a subpossa to attend a court, or on an order before an arbitrator, or refuse to be sworn and examined, or prevaricate in their evidence; for non-observance of prevarioate in their evidence; for non-observance of an award duly made; for non-payment of moneys, or neglect or refusal to perform an act pursuant to an order; unduly perverting the proceedings of the court; writing privately to a judge on a case in court; or for doing any act derogatory to the authority of the court or the respect due to it. Foreign attachment is a process peculiar to the city of London and some other places, issued out of the lord mayor's or sheriff's court, in the nature of a notice to a person who has moneys or effects in his hands belonging to a debtor, not to part with them without license from the court. This person is called the garnishes. It has been considered that the lord mayor's court has jurisdiction sidered that the lord mayor's court has jurisdiction over the garmshee if he can be served with the notice over the garmanee it he can be served with the notice within the city, although he has no residence or office within the city, and the goods or moneys are not in the city; but this question is now before the court of Queen's Beach, which has not yet delivered its judgment. Unless the debtor settle the demand, or he or the garnishee successfully defend the action, the plaintiff recovers judgment against the garnishee to the extent of the assets in his hands for the amount of his claim. If the action be not defended, the claimant must give a bond to return the value of what he recovers from the garnishee, if the debtor should come in within a year and a day, and defend the action and recover judgment.

ATTACK, di-tak', in Mil. Lan., denotes an advance upon an enemy, with a view of driving him from his position. It may be made either upon an adverse army in the field, or upon a fortress. In every age, possion. It may be made either upon an adverse army in the field, or upon a fortress. In every age, the most experienced generals have generally preferred making an attack, to protracting the war by tedious and indecisive manouvres, which harass and dispirit their troops. The army making the attack, especially if unexpected, possesses manifest advantages over the enemy, which generally more than counterbalance even very considerable advantages on the other side. Hence, an experienced general always chooses, it possible, to keep his enemy on the defensive. The nature of the attack depends upon the condition and position of the enemy, upon the condition and position of the enemy, upon the condition and position of the enemy, upon the craiming a consequence when craiming from Lat. tangere, to touch, catch, or take, or tingere, to stain, to impute, charge, or accuse), in Law, is the immediate consequence when sentence of death is pronounced. The criminal is then called attaint,

immediate consequence when sentence of death is pronounced. The criminal is then called attaint, attinctus, stained, or blackened. He is no longer of any credit or reputation; he cannot be a witness in any court; neither is he capable of performing the functions of another man; for, by an anticipation of his punishment, he is already dead in law. It is often confounded with conviction; but a man may be convicted, and not receive indrament for a time, or the victed, and not receive judgment for a time, or the conviction may be erroneous. To be attainted, he must have judgment of death. A person attainted of must have judgment of death. A person attainted of high treason forfeits all his lands, tenements, and hereditaments; his blood is corrupted, and he and his posterity were formerly rendered base; but by 54 Geo. III. c. 148, 3 & 4 Will. IV. c. 108, and 4 & 5 Will. IV. c. 23, the former rigour of the law was modified. By the first act, except for treason or felony, the attainder will affect only the offender for his natural life, and will not extend to disinherit or prejudice the right of title of any other persons after his pump, emetios being utterly useless, from the paralyzed good on the stomach.

ATTACHÉ, di-tibbh-di (Fr., attached), in Dipl., is a name given to certain young gentlemen who are attached to embassies in the capacity of assistants, with a view to their being made familiar with the duties of the office, in order to their afterwards holding appointments in that department of the public service.

ATTACHMENT, di-tachi-ment (Fr. attacher, to attacher will not affect land, chattels,

or stock vested in any person attainted, upon any trust, or by way of mortgage, or any profits thereof. Persons may be attainted by ant of partisament. The attainter may be reversed or falsified by writ of error or by plea. If by writ of error, the consent of the crown to the writ must be obtained; and when by plos, it may be by danying the treason, pleading a pardon by act of parliament, &c.

ATTAMA, &-tai-M-d, in Bot., a gen. of palms com-prising numerous species, nearly all natives of the tro-pical parts of America. They have in general tall and smooth cylindrical stems; but a few species are stemsmooth evindrical stems; but a few species are stem-less. The leaves are large and pinnate; the fruit a nut, with three seeds and three cells, inclosed in a dry husk. The species A. funifera is the most important member of the group. The fruits constitute the Co-quills nuts of commerce, which are largely imported into this country. The pericarp of this fruit is very hard, and forms a kind of vegetable ivory, adapted for han dless of doors, drawers, walking-sticks, and umbrellas. The pendulous fibres of the leaf-stalks are much used for cordage, the ropes made from them being very strong, and extremely durable in salt-water. The fibre resembles piassabs very closely; and, in fact, until quite recently, the two kinds of fibre were thought to be identical. (See Leofoldinia, the Piassabs palm.) From the seeds of A. Cahomi a fatty oil may be ob-tained. A. compta, the Pindova palm, produces a fruit about the size of a gooso's egg, the kernels of which are estable.

ATTLE, or OTTO, OF ROSES, ål'-tar, an essential oil obtained from the petals of three species of rose,—namely, Rosa centifolia, moschata, and damascena. The rose-gardens at Ghazcepore have long been famed for the production of the precious liquid. These gardens are large fields, planted with rows of small rose-bushes. The blossoms, which unfold in the morning, bushes. The blossoms, which unfold in the morning, are all gathered before noon; and their petals are at once transferred to clay stills, and distilled with twice their weight of water. The rose-water which comes over is placed in shallow vessels covered with moist muslin, to exclude dust, and exposed all night to the cool air. In the morning the thin film of oil which has collected on the top is carefully swept off with a feather and transferred to a small phial. This process is repeated morning after morning, till nearly the whole of the oil is separated from the water. Heber says that about 20,000 roses are required to yield a rupee weight (176 grains) of attar; and this quantity is worth £10. (176 grains) of attar; and this quantity is worth £10. Attar of roses is imported from Smyrna and Constantinople; but it rarely, if ever, arrives in this country pure. It is commonly adulterated with spermaceti and a volatile oil, which appears to be derived from one or more species of Andropagon (see this word), and which is called in London oil of ginger-grass, or oil of gera-

ATTENTION, at-ten'-shon (Lat. attentio, from ad, to, and tendo, I stretch), is a term used in Mental Phil, to denote a steady exertion or due application of the mind to any object of sense or intellect, in order to its being thoroughly understood, and afterwards remembered. When we see, hear, or think of anything, and feel a desire to know more of it, we attempt to keep the mind fixed upon it; and this fixing of the mind is call d attention In other words, it is that effort of the mind to keep before it an idea or perception, and to ex lude for the time all other objects that solicit its notice. According time all other objects that solicit its notice. According to Stewart, it is a distinct faculty of the mind; and, though this view does not seem to be the correct one, yet his remarks on this subject are acute and valuable. Bir William Hamilton combats this opinio, and maintains that attention is not a special faculty of the mind, but only "consciousness concentrated." "It is," be says, "consciousness applied by an act of will or de-sire ander a perticular law." This law is terms the law of limitations, which is "that the intension of our knowledge is in the adverse ratio of its evtension: in other words, that the fewer objects we consider at once, the clearer and more distinct will be our know-ledge of them." The greater the number of objects to which the mind is at the same time directed, the smaller is the intensity with which it is ably to consider each, and, consequently, the less vivid and distinct will be the information it obtains regarding them. Though attention is generally, yet is not always, a voluntary Action

act; for sometimes it is seized upon and fixed by an object of interest beyond the power of control. According to Sir W. Hamilton, there are three degrees or kinds of attention,—"the first, a mare vital and irresistible act; the second, an act determined by desire, which, though involuntary, may be resisted by ur will; and the third, an act determined by deliberate volition." Considered in its highest degree as an act of the will, the power of concentrating attention is of the utmost importance. Every idea is vivid in proportion to the degree of attention that is given to it; and it is only by the attention that is given to it; and it is only by the attention that is given to one object that we can form a distinct notion of it, or discover its nature, attributes, or relations. It is also one of the greatest aids to memory, to which it seems to be greatest aids to memory, to which it seems to be essential that the perception or idea which we wish to remember should remain in the mind for a certain space of time, and be exclusively contemplated by it. One may obtain the same command over his mind that he has over the muscles of his body, and may learn to be attentive as he learns to walk or to write. The stronger one's power of attention, the longer and more steadily will he be able to follow out the same train of thought, and the greater will be the success attending his labours. "Genius," says Helvetius, "is nothing says Helvetius, "is nothing on;" and Sir Isaac Newton, but a continued attention; and Sir Isaac Newton, when complimented upon his great discoveries, remarked, "that if he had made any improvements in those sciences, it was owing more to patient attention than to any other talent."

than to any other talent."

ATTHRITON, a cautionary word used in the British military service as preparatory to any particular exercise or manœuvre: gara-a-rous has the same signification in the French service. Upon receiving this command, the infantry soldier, whether of the line, volunteers, or militis, assumes the following position:—Shoulders square to the front; heels kept together; the start transfer contract of the first forming an angle of sixty. Shoulders square to the front; need sope sogether; toos turned outward; feet forming an angle of sixty degrees; arms depending straight from the shoulders; palms of the hands falling flat upon the thighs; body straight, but with a trilling inclination forward, in order that its weight may principally fall upon the fore part of the feet; head kept erect, but without being thrown back; eyes looking straight to the front; the whole position being perfectly easy and uncon-strained, without any rigidity or awkwardness.

ATTENUANTS, dt-ten'u-ants (Lat. attenuo, I make thin), in Med., a term applied to those remedies which, it is supposed, have the power to impart to the blood a thinner or more fluid consistence.

ATTENUATED, ăl-ten'-u-ai-ted (Lat. attenuo, I make

thin), in Bot., tar-ring gradually to a point.

ATTENUATION, at-ten-u-ai'-shun, is a term employed
by distillers and brewers to denote the weakening of saccharine worts, by the conversion of the sugar into carbonic acid and alcohol, during the process of fer-

ATTESTATION, at-tes-tail-shon (Lat. attestor, from ad, and testor, I call to witness), of a deed, will, or other instrument, is the execution of it in the presence of witnesses, who indorse or subscribe their names under a memorandum, to the effect that it was signed or executed in their presence. In general, one witness is sufficient to attest a deed or other legal instrument; but if it be executed in pursuance of a power which directs it to be done in the presence of a given number of witnesses, it will be void unless it be attested by such number. The execution or acknowledgment of a will must be attested by at least two witnesses, who must both or all be present at the time of the execution or acknowledgment of it by the testator, and must subscribe their names as witnesses thereto in his presence, and in the presence of each other.

sence, and in the presence of each other.

Arric, iti-tik (Gr. attikos, belonging to Attica), a term in Arch., applied to a low parapet-wall surrounding the top of a building, and placed on the entablature. It in generally plain, but sometimes broken with pilasters, before which figures in high relief are placed, as in the Arch of Constautine. It was intended to conceal the roof, and give a more imposing appearance to the building. In ancient architecture its height varied greatly, but in modern times it is generally made equal to that of the entablature. In Building, the term is annied to rooms made in the roof Building, the term is applied to rooms made in the roof of a house. An attic base, in Arch., is that which

consists of an upper and lower toque, separated by a scotia and fillets, measuring in height one-third the course and mess, researched in angle of the column it supports. It is commonly applied, now, to the rooms built in the roof of modern dwellings. The expression is also variously employed in other ways. Thus, sharp and subtle wit is often called Attic seasoning or sait; a witness that is incorruptible, an Attic witness.
ATTIC DIALECT, THE, is that dialect of the Greek

ATTO DIALECT, THE, IS thus charges of the Green language which was spoken in Attics. It was the most refined and polished of all the dialects of ancient Greece; and is it woote Solon the lawgiver, Thucydides and Xenophon the historians, Aristophanes the comic poet, Plato and Aristotle the philosophers, and De-monthenes the orator. When, after the Macedonian conquest, Greek became the language of literature and diplomacy in mest parts of the civilized world, the Atticame to be that dislect of the Greek which was generally adopted.

ATTITUDE, dt'-ti-tude, in Paint. and Sculp., the posi-tion and gesture of a figure, by which the sentiment or passion of the person represented is denoted. At-titude is to the limbs the same as expression to the features, and should be natural, unconstrained, and varied. In a group of figures, the attitudes should be contrastive, and so composed as to balance and set off

each other.

ATTORNEY, dt-tur'-ne (Lat. attornatus, ad, torno, and Fr. attourner, to turn), is one man set in the place of another, and who has authority given to him to act in the stead and place of him by whom he is delegated, in private contracts, agreements, and other matters of business. His authority must be by deed, which is called a letter or power of attorney, which requires a

stamp of 30s. (See AGENT.)

ATTORNEY-AT-LAW answers to the proctor of the civilians. Formerly, every suitor (as now the defendant in criminal cases) was obliged to appear in person. To remedy this inconvenience, and to regulate the admission and government of attorneys, several statutes have from time to time been passed, the first of which was the statute of Westminster, the 2nd, c. 10 (temp. Edward I.). The following will apply as well to a solicitor as an attorncy. He must be articled, and serve his articles, for a term which has been fixed as follows:-One who has taken a degree (specified in 23 & 24 Vict. c. 127) at a university, or been called to the bar, or been for ten years a bond fide clerk to an be sor, or been for ten years a companie there to an attorney, three years; in other cases, five. He must be sworn to demean himself honestly; be admitted and eurolled, and take out an annual certificate, without which he cannot duly practise nor recover his fees. Before admission, he must pass an examination, to show he is qualified. No action can be commenced for his fees until one month after his bill, signed by him, or his executor, administrator, or assignee, or, in the case of a partnership, by any of the partners, either with his own name or the name or style of the partnership, be delivered to the party to be charged partnership, be delivered to the party to be charged therewith, or sent by the post to, or left for him at his counting-house, office of business, dwelling-house, or last known phase of abode, or be inclosed in or accom-panied by a letter, sigued in like manner, referring to such bill. His bill is subject to deduction or taxation by an officer of the court; and it is be taxed by the client, and more than one-sixth be taken off, the attorney is liable to pay the costs attendant on the taxation. Being ano finer of the court, he is amenable to it for any malfearance or misappropriation of moneys or securities, or for improper conduct in his character of attorney; and the court may order payment or restitution, or fine, or commit him for contempt, suspend to the court may order payment or restitution, or fine, or commit him for contempt, suspend to the court may be the first first wolls of the him from practising, or strike him off the rolls of the court. In the last two cases, the other courts in which he has been admitted will deal with him in a similar If he be convicted of any offence, although not in his character of an attorney, which would materially affect his standing or position in society, the courts would also strike him off the rolls. Neither an idiot, a married woman, nor an infant, can appoint an

ATTORNEY-GENERAL, a great law officer of the crown, whose business is to exhibit informations, and prosecute for the crown in matters criminal, and institute suits in the Exchequer for anything concerning

the queen in inheritance or profite. His proper place is sourt, upon any special matters of a criminal sparre wherein his attendances required, is under the judges, on the left hand of the clerk of the arrows; but this is on the sets mand of the carry of the grown; but mas seemed, upon seleme and extraordinary occasions; for usually he does not sit there, but within the bar; in the face of the court. The queen-conset is also privileged to have an attorney-general.

ATTORNEY OF THE DUCHY COURT OF LARCASSEES is

the second officer in that court, placed as assessor to

the chancellor of the court.
ATTOERNERT, di-turn'-ment (Lat. attern ATTORNMENT, means the state of the state of professing or agreeing to become tenant to a new landlord, on the alienation of property, or on its being recovered in an action of ejectment. In the

being recovered in an action of ejectment. In the latter case, the attornment is to prevent the necessity of the tenant being actually turned out of peasession, under the process, to give possession to the plaintiff, by virtue of the judgment in the action.

ATTRIBUTE, id-tri-bute (Lat. attribute, from ad, to, and tribuo, I give or bestow), is properly a quality or property ascribed to or belonging to a person or thing. Of the several attributes belonging to any substance, some are termed essential,—those that are necessary to it, and go to form its character, as expectation and attraction to matter; others are termed essential. tension and attraction to matter; others are termed accidental, as roundness in wood, or learning in a man. In Theol., it denotes the several qualities and perfec-In Theol., it denotes the several qualities and perfections which we conceive in God, and which constitute his proper essence; as justice, goddness, truth, wisdom, &c. Some distinguish them into negative, and positive or affirmative; the former being such as remove him from whatever is imperfect in the creature, as infinity, immutability, immortality; the latter being such as assert some perfection in him, which is in and of himself, and which, in the creature, in any measure, is from him: as coodness, holiness, wisdom. Others divide sell, and which, it the cressure, in any messure, is from bim; as goodness, boliness, wisdom. Others divide them into absolute and relative, or into communicable and incommunicable.—In Log., the attributes are the predicates of any subject, or what may be affirmed or

denied of anything.

ATRIBUTES, di-tri-butes (Lat. ad, to, and tribuo, I give), a term used in the Fine Arts, to signify certain symbols which accompany, distinguish, and characterize certain figures and allegories. Thus, the eagle and thunderbolt are the attributes of Jupiter; the caduceus is the attribute of Mercury; the trident of Neptune. Love is always represented with a bow and quiver; Justice with a balance and sword, &c.

and quiver; Justice with a balance and sword, &c. ATTRIBUTIVES, id-trib'u-tive, in Gram, are words which are significant of attributes; as adjectives, verbs, and participles, which are attributes of substances, and adverbs, which denote the attributes only of attributes. Mr. Harris calls the former attributives of the first order; the latter attributives of the second order.

ATTRITION, at - trish' - on (Lat. attritus, worn or rubbed down), in Geol., the wearing and smoothing of rock-surfaces by the passage of water charged with gritty particles, by the descent of glaciers, or by the passage of sand-drift.

passage of sand-drift.

ATWOOD'S MACHINE. (See GRAVITATION.)

AUCKLANDIA, asch-länd'-i-d, in Bot., a gen. of plants belonging to the next ord. Composite. The most interesting species is A. costus, a native of Cashmere, the root of which is supposed to have constituted the costus of the ancients. This root is commonly known in the north-western parts of India by the name of orrisarout. It must with however he confounded with orris-root. It must not, however, be confounded with the true orris-root, which is furnished by a plant be-

the true orris-root, which is furmished by a plant be-longing to a very different order. (See Int.). AUCTION, auk'-show (Lat. augeo, auction; Gr. auxo, increase; Lat. auctio, an increasing), a method of sell-ing property by competition. Sales by anotion are con-ducted on different principles, according to the outsom affecting particular trades, localities, or effects. The most general mode is for a professional map, called an auctioner, to offer the property for sale to persons most general mode is for a professional man, called an auctioneer, to offer the praperty for sale to persons assembled together by advartisement, who compete for the purchase by biddings, or offers of sums of money; and the person who bids last, or the highest amount, is declared the purchaser. Sales of this nature are governed by conditions which bind both the seller and purchaser. A bidder may retract his

bidding before the fall of the hammer. If a person by any means prevent other persons from bidding against him, he cannot compel the delivery of the lot, although he may have said a deposit. If a vendor employ agents at a sule, to bid salely for the purpose of exciting compellines, and without any intention of purchasing, he must amounce it, or the sais is void if any which or fraudulent misrepresentation of the property or contrel put up for sale be made, either in the description or otherwise, the purchaser is not bound to complete the sale, and he can compel a return by the auctioner of the purchase or deposit money, or such part of, it as will make up the deficiency in value. In a Butch auction, the auctioneer commences by naming a high price, and gradually reduces it until some person closes with his offer. In some cases, auction sales, or biddings, are effected by a minute guishment of the light, is declared the purchaser.

Auction sales, or biddings, and the bidder immediately preceding the running out of the sand, or the extinguishment of the light, is declared the purchaser.

Auction sale before a bidding is made. He is the agent both of the vendor and purchaser, and, as such, may bind both. He is entitled to hold the purchase or deposit money as stakeholder for both parties, until the contract he completed, without paying interest

may bind both. He is entitled to hold the purchase or deposit money as stakeholder for both parties, until the contract be completed, without paying interest for it, and he is personally liable to the purchaser if he pay it to the vendor before completion. If both parties set up a title to the deposit, he can compel them to interpleed to establish the right. He has a special property in goods sold, and may maintain an action against the purchaser for the price. If he sell without declaring who is his principal, the purchaser can compel him to complete the contract.

Aucuia, 'ac-bu'-bû, in Bot., a gen. of plants belonging to the nat. ord. Cornaces. The only known species is A. feponica, which, as its name implies, is a native of Japan. It was introduced into Britain as a hothouse plant, but was soon found to be hardy enough

is a repositor, which, as its means implies, is a factor of Japan. It was introduced into Britain as a hothouse plant, but was soon found to be hardy enough to flourish in exposed aitastions. It is now a very common ornamental shrub, especially in the parks and suburban gardens of large towns. It is remarkable for its shining pale-green leaves mottled with yellow, which have obtained for it the common name of Variegated Laurel. The plant is diocious, that is to say, the male and female flowers are produced by separate individuals. The female plant is alone known in this country; hence it never yields seed, and can only be propagated by layering, or by slips or outtings. ADDIENCE, as deficient (Lat. addio, I hear), denotes the attention that is given to a person while speaking, or persons listening to a public speaker, singer, or other performer. The ceremony of the admission of ambassadors or public ministers to a king to deliver the oredentials of their sovereign is likewise called an undience. In History it is the name of certain tribu-

audience. In History it is the name of certain tribu-nals or courts of justice established by the Spaniards

in America.

Auditor (Lat. audio, I hear), in a general scase, one who listens or attends to anything; in English Law, an officer of the crown or some great person who makes a yearly examination of the accounts of the under-officers. Receivers-general of fee-farm rents are called anditors. The auditors of the imprest were are caused anattors. The auditors of the impress were officers of the Exchequer appointed to take the accounts of the receivers of public revenues. The present Board of Commissioners, exercising the duties formerly divided between various departments of the Exchequer, was constituted in 1806. In France, the members of the Chambre des Comptes were divided into conseillers. matters and conscillers auditeurs. In Com, auditors are persons appointed to examine, vouch, and certify the correctness of the accounts of a public company

or body.

AUDITORY, aw'-di-to-re, in Anat., is a term applied to certain parts of the organs of hearing; as the auditory nerse, meature auditorius, &c. (See Ear.)

AUDITORY (Lat. auditorium, an audience), an assemblage of persons gathered together for the purpose of hearing a preacher, lecturer, &c. In the ancient churches, the term auditory, or auditorium, was applied to that part of the building where the people stood to be instructed, and hear the Gospel: it is now called the nave.

Augaburg Confession

Avers, aw'-ow' (Du. cregary, Sax. sane-ger), an instrancest used for boring large holes by carpenter, wheelwrights, shipwrights, and others. It consists of an iron blade, terminating in a steel bit, with a handle placed at sight angles with the blade. When the suger has a straight chaunel or groove, it is somatimes called a "pod amper;" when it has a spiral charact, it is termed a "screw gager." A large kind of suger is used in agriculture for boring the earth in order to excertain the nature of the subsoil, minerals, or whether water is existing in a certain place.

Avers, aw'-jits, a species of horablende, known also as pyrozene. It is found in many volcanic rocks, such as basalt and porphyry, and consists of silicate of lime and magnesia. It is greenish-black or entirely black, and is generally more or less translucest, according to the amount of magnesses and irva contained in it. It crystallizes in hexagonal prisma, ter-

according to the amount of manganess and jr.ta contained in it. It orystallizes in hexagonal prisms, terminated by dibedral summits. A transparent green variety found in the Tyrol is used in jewellery. Havy gave it the name of pyrozens.

AUGMENTATION, COURT OF. (See COURTS.)
AUGMENTATION, COURT OF. (See COURTS.)
AUGMURG CONFESSION, ouggs-boorg, in Eccl. Hist.,
is the name given to that important profession of faith
of the Lutheran church which was laid before the
great diet of Augsburg in 1830. The emperor Charles V.,
is couldn't having about the manifest of the county in order to bring about an amicable settlement of the religious differences that were then existing in Germany, summoned a diet of the empire to meet at Augaburg, and requested the Protestants to bring before it a short summary of those doctrines in which they differed from the church of Pages. better it a snort summary of those accurace in which they differed from the church of Rome. John, elector of Saxony, therefore applied to his Wittenberg theologians, at whose head was Luther, to draw up articles of their faith, and to lay them before him at Torgau. These Torgau articles formed the basis of the Augsburg These Torgau articles formed the basis of the Augsburg Confession, which was drawn up at Angsburg, by Melancthon, assisted by other distinguished theologians, and approved of by Luther, who, however, could not appear at Angsburg, but remained at Coburg, not far distant, being under the ban of the empire. It is characterized by the clear methodical style of Melancthon, as well as by that gentle conciliatory spirit for which he was distinguished. His evident intention was to approximate as much as possible to the doctrines of the church of Rome, defining, at considerable length the heretical errors which they both siderable length, the heretical evrors which they both agreed in rejecting, and moderating, as much as pos-sible, the points of difference between them. He sought to establish the doctrines of Protestantism, sought to establish the doctrines of Protestantism, not only on the authority of Scripture, but also on that of the Fathers, especially Augustine, from whom the Romanists could hardly dissent, and who could not be accused of heresy. It consists of twenty-eight articles, twenty-one of which state the principles of their belief as regards faith and doctrine; the remaining seven treat at some length of those points in which they differ from the church of Rome. The following are the subjects of the several articles:—1. Of God: they differ from the church of Rome. The following are the subjects of the several articles:—1. Of God: 2. of original sin; 3. of the person and mediation of Christ; 4. justification; 5. preaching and the sacraments; 6. faith; 7 and 8. the Church; 9. baptism; 10. the Lord's Supper; 11. confession; 12. repentance; 13. the use of sacraments; 14. church government; 15. rites of human institution to be observed; 18. secular occupations; 17. Christ's second coming; 18. free will; 19. God not the author of sin; 20. faith and good works; 21. saints to be respected. not workers. secular occupations; 17. Christ's second coming; 18. free will; 19. God not the author of sin; 20. faith and good works; 21. saints to be respected, not worshipped. The abuses that had crept into the Church were—22. Depying the sacramental cup to the lastry; 23. imposing calibacy on the clergy; 24. of the mass; 25. of confession; 26. of fasts and other ceremonics of human invention; 27. of conventual vows; 28. of civil and ecclesiastical power. Its authors evidently had no intention of making it a permanent or immutable standard of faith, but simply gave it out at a statement of the beief then held. "Our churckes teach," "it is taught," "it is unanimously taught," "such and such opinions are falsely imputed to us," are the expressions used. These articles were read before the diet on the 25th of June, 1530. The papal theologians, headed by Faber, wrots a confustation of the Confession, which was also read before the diet, in the month of August of the same year. Melanothou answered it in his "Apology for the Augsburg Con-

### Augunie

lession," which was pr the other Swiss and P published in 1556. The alterations which he then made on the tenth actions, with a rice to unite the Luthersus and Calvinite, gase rice to much controvery; the Luthersus repudiating the alterations, and holding by the uniteract Confession; while the reformed churches accepted the altered one.

Augustis, as one research and announcements made by the Bonan segues, and which constituted their supposed science and inspiration. Public anguries were, —1. Appearances in the heavens, as thunder and lightning. The sugar marked the place where the flash of lightning originated, and where it disappeared. He stood on an elevated place, where he had a full wiew of all ground him. After the sacrifices had been made, and solemn prayers offered, he took his station, his face towards the sact, his head covered, and pointing with his staff to that portion of the heavens within the limits of which he proposed to make his observations. On the left were the propitious, on the right the unpropitious omens. 2. The ories and the flight birds. Fredictions founded on the observations of birds were properly called auspices, and were comparatas, as guess, the ceremonies, superstition of birds. Fredictions founded on the observations of birds were properly called auspices, and were common among the Greeks, who took them from the Chaldeans. They afterwards became so important, that, among the Romans, nothing of consequence in peace or war was undertaken without consulting birds, whose continual flight was supposed to give them universal continual fight was supposed to give them universal knowledge. They were propitious or unpropitious, either from their species, or from the circumstances in which they appeared. The birds of a prophetic cha-cacter were divided into two principal classes,—those whose flight and those whose cry was indicative of future events. In the latter class were included the tuture events. In the latter class were included the raven, the crow, the night-owl, and the cock; in the former were the eagle, the crow, the raven, the kite, and the vulture. The two last were always unpropitious. The eagle, on the contrary, was propitious when he flew from left to right; the crow and the raven were propitions on the left, and unpropitious on the right. Thirdly, the willingness or unwillingness of chickens to eat was considered ominus. the right. Thirdly, the winingness or unwiningness or chickens to eat was considered ominous. The former was interpreted as a good omen, the latter as a bad one. Chickens were made use of particularly in war. Besides these three principal classes, certain omens were drawn from quadrupeds; such as a best crossing a path, or being seen in an unusual place; or from occurrences more or less uncommon; as sudden melancholy, sneezing, spilling the salt upon the table, &c. Although the august explained the majority of the signs, and taught how the gods could be appeased, yet the right of inquiring how war would terminate belonged only to the commander-in-chief; and its fortunate or unfortunate issue was attributed to him alone. Ref. English Cyclopadia—Arts and Sciences.

AUGURS, aw-qure (Lat. augures).—Among the people of ancient tally, in common with all rude nations, it was imagined that in every occurrence which could not be understood there was a special manifestation of the will of the gods. The power of reading and interoccurrences more or less uncommon; as sudden melan-

the will of the gods. The power of reading and inter-preting these signs was supposed to be a peculiar gift conferred on the favoured mortal from his birth. A superstition offering se arrong a hold upon the minds of the people was turned to account by the actute poli-ticians of Rome, and the College of Augure was insti-tuted at the vary arrived. ticians of Rome, and the College of Augurs was instituted at the very earliest period of Roman history.
Augurs were, a certain sort of priests, who predicted
future events and announced to the people the will of
the gods. They were consulted both in public and
private affairs, and their influence in the state was
very great. By merely pronouncing the words Aliodie (another day), they could dissolve the assembly of
the people, and annul all the decreas that had been
passed at the meeting. The original number of augurs
is stated differently by Cheero and Livy. Dicero,
himself an angur, says that Romains associated three
ethers with himself, and that Numa added two. The

# Auk, Great

ch was passed 30/ a.c., or angusal culleges to the

the extracedurary power was conferred aroun Augustus of electing angure at the pleasure. Bef. Legitic Cyclepastre Arim and Geimose.

August on past, in Chica, is the name given to the eighth meath of our year. It was named by the Bomes emperor Augustus, after insaell, as he regarded it as a fortunate menth for him, being that in which he had gained several important viatories. Before this time it was railed Scatilis, or the eight month, the year beginning with March. The same of July had, in like manner, been Questilis, before it was changed by Julius Casar; and as it contained thirty-one days, the senate, in order that Augustus might not be behind Casar, decreed that August as day should be taken away from February.

AUGUSTINE MONKE, as gue-lin, a chilipus order in the church of Rome, who follow the presented raile of Augustine prescribed to them by Pope Alexander IV, in 1256. There had arisen, previous to that time, several religious orders, which Innocent IV, formed the design of uniting into one congregation; and this was carried out by his successor. At present, the order is divided into several branches; as the Hermito St. Paul, the Jeronymitans, monks of & Reidget, and the Barefooted Augustines, the last being imitiated by a Portuguese in 1574, and onlinemed by Pope Clement VIII. in 1600 and 1602. The presented rule of St. Augustine is, briefly, that the monks are to have sell things in common; that the rich who either into the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to sell their possessions and give them to the order are to the morning in labouring with their hands, and the morning in the bear of the passes of have a consisted the more of the passes of the passes of the passes of the passes of th

even in Austria and Naples it has been decreasing. It is most powerful in Sardinia and America.

AUK, GREAT, awk (Alca impensis).—Although this bird has occasionally been met with on the British coast, the northern latitudes are more congenist to the habits; and hence, owing to our limited acquaintance with the inhabitants of the Arctic regions, it is not very well known. In the collection of the British Museum there is a male specimen of this bird, which was sent to Mr. Bullock during his tour in the Crkneys. This was one of a solitary pair seen in those regions: the female was killed a little time previous to Mr. Bullock's arrival. That gentleman took part in a long chase of the male, but was unsuccessful; the auk, although pursued by a sir-oared bost, making its way under water with remarkable celerity. The wings of atthough pursued by a six-oaren post, making its way under water with remarkable relerity. The wings of the great auk are but partially developed. In length it measures about three feet, and its wings scarcely exceed four luches. Though the wings are almost uscexceed four inches. Though the wings are almost use-less for abrial locamotion, they are well adapted for assisting the bird's progress under water. How far north these birds may be found is not known; so far, however, as our Arctic explorers have pensitated, the great auk has always been seen. Its movements on land are somewhat swiwerd; and, indeed, it is alto-gather adapted for an agnosius existence. Except at the breeding season, it harely visits the shore. While

# Ank, Little

is a ve walking on hers



THE GREAT AUK

Ave, Legress (Dra Alle), is the most diminutive of the sak tube, and the hardiest The colder and wilder the region, there do they seem to congregate in larger flocks, and enjoy the inelement weather with as much reliah as their human companions the Esquissant. In the locality of Bathn's Bay they are found in large flocks, also at Melville Inland On the inhospitable wilds of Spitzbergen and Greenland thou asads of these birds find a home. Here they watch for the breaking up of the i.e., and then swarm down in myriads, and busily search for the rustaces in the distures of the broken ice—li very rarely visits this finance of the broken nee li very rurely vanta this
country; radeed, those that have been seen are more
probably storm blown casts ways than vantors in search presents where never have the little auk is a compact, storik hird, about nine inches in length. The upper parts of the plumage are mostly black, the checks and nader-parts white, the legs yellowish brown the bill black. In summer the front of the neck which during the winter is black, sesumes a paler but It lays one agg, of a pale blush green, and, like the pro-ceding, affects the high st chils

ceding, affects the highest chies

Ave. Rizos sur Leo (Alca torda), larger than the AUK, RAZON-BLILED (Alea torda), larger than the preceding; when full grown, it measures about fitteen incloss in length and twenty seven across the wings This species is found also in the Arctic regions, but, night that great sail, is a frequenter of warmer of matter, including the coasts of Great Britain, Franco, Holisaid, and Germany These birds take up their abode on the highest chiffs attainable, and live together in large flocks, associating with the guillemots aid sittewakes. About May the auk colonies begin their task of incubation, sitting closely together in low-one above site other. It is very remarkable, that, although the rason-billed auk lays but one egg, and so many Attaireds are accumulated on the chiffs at one time, without say fund of covering to it note their remany Attacrets are sommutated on the cume at our time, without say kind of covering to denote their re specifive owners, no inconvenience is occasioned, every ask knows we own egr, and probably in no instance is the pakermy of a young bird questionable. It has consistent some wonder how the eggs of the suk are commanded some wonder how the eggs of the auk are kept to becare on the small ledges on which they are laid, said if he remarked, that is a human shand were to remove one, the most delicate artifice would fail to replace it mas secure a position. The balancing powers of the said are, however, considerably overrated, for it has them assertained that the egg is attached to the spot by a ghibbous substance, with which it is, when newly laid, overred. The wasor-balled suk is very common in Scotland, and in the Hebrides are several breeding places. "Case of the most interesting is the little island of Bernersy, called by manuers Barray Head, and the finite from the coast of Scotland on the one hand, and it Kilda on the other, and one or a group of islant season the fighth Islan of Barray."

# Sink orms

selected by the auks; while in the are stationed the guillemets and ke coming almost to high water mark

AULIC COUNCIL, and lek (Lat. out name of a council of the old German ampire, called, in German, the Ronchapfrein. It was natit is power to the Imperial Chamber, which was the highest count in the Empire. When the Estates chilged the empireous, in 1405, to establish the count of the Empire Williamber, he still returned about his court persons for leaking after the affairs of his erown leads, and top Persons after the affairs of his erown leads, and top Persons of these chambers for the Imperial Chamber. In the symptomeric of these, the empire would not allow the Imperial Chamber. The members of the Aulis Council also came to take a commission of induced represents, and the came to take cognizance of Judicial processes, and I states frequently complained of this after 1502 15.9 its organization was more determined, and, by the peace of Westphalis, it was recognized as the second of the two supreme courts of the smarre, and equal in dignity to the Imperial Chamber. It was equal in dignity to the Imperial Chamber. It was composed of a president, a use-president, and eighteen councillors all chosen and paid by the emperor, but a part of them, at least, were to be taken not from Anatra, but from the other states of the empire, and six were to be Protestants If the Protestant councillors were unanimons upon any point, the votes of the rest could not overthrow them. The commillors were divided into a bench of counts and lords, and a were nitured into a busen of counts and inrea, and a bench of learnied men, with no distinction, except that the latter, who were generally raised to the rank of nobits teet ved a lighter slary. The vice-chancetic of the empire, appoint t by the elector of Mainz, had also a seat in the council and a voice after the presi-dent. Under the exclusive winds ten of the sent deat Under the cyclustre jurisdiction of this court were—1 All feudal questions in which the emperor was immediately concerned, 2 all questions of appeal on the part of the Estates from dicisions in favour or the emperor in minor courts, 3 all matters concerning the importal jurisduction in Italy Its decisions were submitted to the emperor on his approbation, on which they became law It d d not in any way interfere in they it came use it cannot in any way interiers in the political or state ulains of the empire. The council ceased at the death of each empirer, and had to be accounting tell y his su cessor. It finally cessed to count on the extract in of the German empire, in 1800 AURANIALE are rin it as see in 1801, the Orange

AUBANIALE aw rin it as see, in Bot, the Grange fam, a rat ord of decetyledonous plants, consisting of trees and shrubs often of great beauty. The order is in cluded in the sub class \*Pholomyfors\*\* There are txenty three genera, and about ninety-five species, chiefly natives of the East Indies, but generally distributed by the agency of man throughout the warmer regions of the globe. Their flowers are regular, and usually odoriferous their flowers are regular, and cloud in receptacles containing assential oils, which are much used in perfumery, for flavouring, and fer other purposes. The oils are especially abundant in the leaves, the petals, and the rind of the fruit. The latter also contains a bitter tonic practicity. The cities fruit known as the orange, lemon, lune, shadded, citron, pumpelmoose, forbidden fruit, ladian lael, and wampee fruit are the produce of this order. (See CITRUS, MGLE, FERONIA, COOKIA.)

(See CITRUS, MULE, REMORAL, CONSTRUCTION AURPLIA (See CHRYSALIS)

AURPLIA (See CHRYSALIS)

AURPOLA, as re-o ld (Lat, of the colour of gold), in Pant, the glory with which ancient painters encircled the heads of the Holy Family, saints, martyrs, and con-

fessors, in their pictures,

ATRIUS, as re-use (Lat curum, gold), a Roman gold con, the value of which, according to Tzeitus, was 16s; other writers, however, make it of different values, between 12s and 21 ds. It weight was nearly 24 oz svordupou. Augio Acid, aw-rik (Lat. awres, gold, terminal e.) (AuO.).—Teroxide af gold, when hydrated, readily



It inhabits a shell somewhat oval in alape, and marked the The fancied or real resemblance of the ATTE PAGE eafs of certain animals accounts for the

The earth of the things and the month of the state of the has been cultivated in Britain since the close of the 18th century; and an immense number of varieties, many of exquisite beauty and fragrance, have been developed. The culture of this charming flower is a flavourite nanosement of the operatives of manufacturing towns, who often manage to save large sums for the purchase of new varieties. Some of the most perfect flowers, in form, golour, and shading, have been raised in little gardens belonging to the factory-men of Lancashire. Lancashire.

Austoular Compression. (See Convession.) Austoulars, on-rik'-u-lait (Let. anricula, little ear) AURICULAR CONFESSION.

Augrophare, on-rib'-a-lait (Lat. anricula, little ear), an Est., a term applied to a leaf having two small est like these at the hase. The leaf of the Woody Michiahade (Sobrem Dulcamara) is an example.
Augrophamade, sobrem Dulcamara) is an example.
Augrophamade, sobrem Dulcamara is an example.
Augrophamade, sobrem on the lat. auron, pold, fero, I yield), in Geol., a term used to signify that certain rocks and when yield or contain gold; hence the terms cauriforms veins, 'auriforms sands,' ac. Advanta, and yield in the Northern Hemisphere, between Persons and Gemini, represented by a man is a positive resembling sitting, with a goat and kids in his last size, and a bridge in the bedy of the Goat, called Capella. The most researchable star in this constellation is one of the first magnitude, in the body of the Goat, called Capella. mitude, in the body of the Gost, called Capella.

parst, as one (Lat. curis, the ear), is a term ap-d to one who studies and professes to cure diseases

the sar.

It can Beginning, overer's bor's ai'lls (Lat. over a the morning, over hight praceding sourise, berasis, oughing to the morning, or hight praceding sourise, berasis, oughing to the morth), a magnificent luminous phesence which suppears in the northern heavens. In a country it is ready seen, and never in its full undour; whill the suppearances observed are sufficiely striking and beautiful to excite our wonder and alignmen. Long cheeting streamers are seen to dart out the say, and there are generally attended by a sufficient of diffuse light, surjung from green to up purple, while, so the saying from green to up margin, while, such as it is daying the property of diffuse light, and we special content of the surjung from the surface of the surface lights, as these appearances were monated to the surface and the

comb. towards the east, w sticks when fractur duced when a power! Some observers have lik display of fireworks, and at Siberian hunters, on hearing the ground, and connot be observers of the aurors supin regions where the air wa estimated the altitude at Recent observations, howe the earth. Franklin, at Fe determined the attitude of it to be less than that of aurora borealis is intimate magnetism of the earth. Th are is always situated in th are is always situated in the meridian of the place of object to be a common in invariant the heaven indicated by freely-suspended insegnation as courrence of the phenomeno always greatly distincted, some degrees from its formal positio ever, to be a confection between the carth in receival to the the earth in regard to the see be ascertained, the meteor on both. The southern aurorss many navigators, and are ex-the aurorae of the north. T the autorise of the norm. In-boreain is as yet a matter of co-tific men confidently ascribe if discharge of electricity through field. This view is supported by duced by sending a series of spa-col through a warmer when coil through a vacuous tube. light and diffuse glow form a p near the North Pols. At Ph sentation of an surors bureals displayed two luminous an the other. In this instance light shooting upwards from is commonly the case. Some luminous arcs have been obse several in which the con-separated by a circular of In Plate X in riste X. in Piste representation of an au Beziers in 1781. marked, some o larly, others of m many remarkable appear

been observed petween the survey and the n of the earth, the magnitude needs being very play of the antere. Someonly fraverse distorbed during a display of the surces. Ans aronaof the surces may assumently fraterise the sky atright angles to this immension meridian, though deviations from this direction see not rare. Sie John
Franklis found that the dissurpance of the needle
was not always proportionate to the agitation of
the agreet, but was always greater when the quick
motion and vivid light were observed to take place
in a beay atmosphere. The surora is most frequent
and sivid in high latitudes, towards either pole;
but the meteor is not confined to these parts, as Dr.
Houker states that one of the most brilliant displays
he were wimenessed was under the tropical sky of India;
and other observers have recorded instances of its
appearance in the equatorial districts of the globe." and other observers have recorded instances of appearance in the equatorial districts of the globe." In 1831 a splendid aurora borealis was seen from the Gesport abservatory, and the published description attracts the feest idea of the brilliancy of this meteor and of its instres, colours, and aros. The approach of affords as the best idea of the brilliancy of this meteor and of its lastres, colours, and aros. The approach of the affords was indicated by a peculiar brightness in the atmosphere near the horizon upon the afternoon of the day when it was observed. Shortly after sunstantial and accordance to the northern bording, and acon assumed the form of an arc of refulerant light, ten degrees in height and seventy degrees an accordance in intensity of in width. It continued to increase in intensity of light, sepanding to the western point of the horizon and afty. Ive degrees to the eastward of north, which made the chord of the aurora a bundred and fifty-five A bright, flame-coloured rainbow-like arc. between three and four degrees broad, next emanated from the curved edge of the aurora to an altitude of thirty-five degrees, and, while it remained stationary, a beautiful rainbow-like arch still more brilliant sud dealy sprang up, so that the two bows presented themselves at the same time. After undergoing many variations, during an interval of an hour and a haif's duriation, a great many columns of light, the aurora sank considerably towards the horizon, but presently it increased in altitude, and vivid coruscations radiated from every part of its arc, and, on intermixing with each other, formed wide columns, which were so grand with erimson tints as to astonish every spectator. In less than three hours after its first appearing the surviva had spread at least two-thirds over the heavens, when large perpendicular columns and short, pointed, luminous coruscations rising upwards, glittering like spears with conical points, in nearly parallel rows, now mixing and ther dividing, all passing through red, orange, lake, crimson, green, and purple tints; so that the appearance over so vast an expanse of the heavens was exceedingly grand, particularly as it was contrasted by the cerulean sky and the spangled constellations of the southern portion of its hemisphere. Two hours later, the surers having passed through many more phases of beautiful luminosity, there was a grand display of about twelve or fourteen glowing columns from the aurora, after which a perfectly red rainbow-like arc, ten degrees above the aurora, becare ramow-uge are ten degrees above the aurora, because visible. These sppearances, with some slight modifications, remained during two hours and a half, when the interesting meteoric phenomena began to disappear—Ref. Dr. W. A. Miller's Chemical Physica; Mairan's Traité de l'Aurore borêule; Dalton's Meteomological Observatione; and the Philosophical Transactions, voids, xxiz. xxiv. &c. "The occurrence of aurers, Forestis," says Mr. Broke in his Natural Philosophy. "has invanishly been found, both at Greenwish and elsewhere, to be accompanied by considerable magnetic disturbance; and especially when brilliant corrections are observed to shoot up towards the zenith, large deflections of the declination and billar magnets occur simultaneously; but discharges of atmospheric electricity do not seem to have any of the presence of the magnetic instruments, for the pressection of the magnetic instruments, for the pressection of their and vivid flashes has been frequently potied at Greenwich, and no corresponding disturbance is indicated by the register."

of the absertance while a thing grid half and

prerightating at with assuments.
Avairs districtly user, summers ones (Lat.), Mossic gold, is a gold-coloured metallic-looking submance, need for opening prender. It is a bisulphine of the looking prepared in the following names: As also gain of is prepared in the following manner, as absolving of 12 parts of tin and 6 parts of mesency is formed, and mixed with 7 parts of flowers of sulphur and 6 of sal ammoniae. The mixture is heated is a glass fluid to reduces, until the white funce at first formed occase to be disengaged, the bisulphide remaining baland in the form of hexagonal plates of light golden-yellow metallic appearance. Some years since, a passan was taken out by Mesers. Parker & Hamilton for an alloy of conner and give schick that terrand that true of copper and zinc, which they termed the true Mosaic gold. The specification directed that equal quantities of copper and zine are to be met of a the lowest temperature at which the former will fust, when they are to be well stirred and mixed combine. Small quantities of zine are then added by degrees, until the alloy assumes the desired colour. It is essential that the heat should be as low as possible, to

prevent the rapid evaporation of the zinc.

AURUM POTABLE, po-tüb'-i-le.—If ether is added to
a solution of terchloride of gold, it abstracts the whole of the salt from the water, and floats upon the top in a yellow layer. This compound, which is simply a solution of terchloride of gold in other, was formerly used medicinally under the above name.

AUSCULTATION, and kull-last show (Lat. ausculture, to listen), in Med., is a term applied to the method of ascertaining the healthy or diseased state of certain organs, by attending to the sounds bey produce, either on being struck, or in the natural performance of their functions. In a stricter seuse, the term aus-cultation is conflued to the latter of these cas , the most important discoveries of modern medical gience;

for, though Hippocrates gives directions how, by acs-cultation, fluids are to be detected in the thorax, yet the subject seems to have attracted no attention for many centuries. In 1761, Leopold Avenbrugger, a physicism of Vienna, published a small volume in Latin, cutitled Inventum novum ex purcussions thoracis humani, as signo, abstrusos interni pectoris-morbos detegendi. The work however, excited little notice till it was translated into French in 1808 by Cornsurt. Soon after this the practice of percussion t came general in France and other parts, and was attended with results far more precise and certain than had been anticipated. In Lacunce's invention of the stethoscope, (See Seg-russcore.) Auscultation is chiefly valuable as throw, ing light upon the diseases of the organs of circulation and respiration in the chest. By carefully studying the varieties of sound (often extremely slight) produced by the organs in health and disease, the skilful physician is able to judge of the condition of these organs

with the greatest accuracy, and thus detect and adopt the best means of arresting incipient disease.

AUSPICIUM. (See AUGURIES.)
AUSTIN'S PLOTTING-SCALES.—The principle of these hilateral double-offset plotting-scales is extremely simple and convenient. The code of the scale have brass cross-pieces, with "station-pointers." By adbrass cross-pieces, with "station-pointers." By adjusting the scale so that the "station-pointers" ere upon the base-line, the zero of the offset scale is made The offest scale being grato coincide with this line. duated right and left from zero, the offsets on either hand can be plotted with facility as fast as they are read off from the field-book. The trouble and delay of either shifting the scale or going over the survey twice (once for right offsets and once for left offsets) is thus obviated. The Civil Engineer and Architect's Journal thus further describes this useful invention : — 'In each cross-piece are two steel spring points, which are worked by a screw with a milled head. By these the ends of the scale are fixed down to the paper dispurpance is indicated by the register."

Appearance of the control of the cont

in the scales, the left-hand scale being serrangement at least three chains de of the base-line can be plotted No. 3 pae scale is given, graduated on either The brass cross pieces form T heads, so as to pair of station pointers for each side of the is the comment in stated to be less costly.

Lightful of being more readily fixed to existing the first pattern the 'station pointers' on the case of the cost of the case of as they are on a brass bar which slides either a shade-and-pinnon movement. This is intended the statement, not only for survey, but for a statement, for which, no doubt, it allords some advantages. The racks must, of course, he market so that they can be set to suit the length of offset reales for which they are intended. They ought to work fries, and eather stiff, and, if not turnshed with sized, youngs to pin their ends down to the board should be claumed by the same movement that pure stown the same. This method affords marked facilities for pioting in all eases where the offsets do not exceed a certain limit, and it will not fail to recommend itself as it effects a considerable saving of time, both in plotting from a field-book and in plotting to a reduced ala i

AURTRALIAM MARNA, one tran h on n n m, a sac charine substance, exuded spontaneously by the leaves of several species of hmalpplus, on min tree, natives of Australia. It resembles manna, but does not contain mannie, the sweet principle being a peculiar had of sagar, to which the name militim has been given it is said to drop from the leaves of X runn fera in

please sometimes as large as almonds
AUSTRAL Signs, and full (Lat at fully, southern, signam, a sign), an expression applied to the last six signs of the zodiac, numers, the autumnal signs I ibra, Acorpso, and Sagittarius, and the winter signs Capit carpus, Aquarus, and Pisce, because they he to the

Appananto, an then tik (Gr authint k , authentic, watchated), is a term applied to something of established authority, something which is what it appears is professes to be. It is usually applied to a writing regionment written by the person, at the time, or mader the orroumstances, that it asserts or implies the transfer authentic in made between authentic and sequine; the former referring to the statement made by an author, the latter to the authorship itself, nat this distinction is not very giver illy observed a determine the authorizers of a document is often a between the highest to be longs to the highest

of the utmost importance, and it belongs to the highest find of orizonan. The proof is of two lands, internal, from the form and contents of the document itself, and external, from the evidence of others.

ATEROR, im 'this (Lat. auctor Fr auteur), is applied to one who cleates or produces anything, or one who writes upon any subject, as opposed to a translation of compiler. It is given by way of commence to chief, as the Author of the universe. The term is also reported any light of the original inventor or described where applied to the original inventor or disconnections. times applied to the original inventor or disco-

of any new art or principle. as a right or power to command and make chered, as royal authority, parental authority in their or religious matters, it is the assumed considerated or religious matters, it is the assumed the distance attributed to certain fithers, councils, but a treatment of the bourts. "Authority," says Bishop Houdley, are present and most preconcilable enemy to a many argument that this world ever furnished." by authority that the Jews and heathens and the truths of Christianity; and it was by the spines that the Roman Catholics attempted d of the principles of

Autograph

ening son which means either a sanchi a writing done by one's pwn hand Autoriography, aw'-to-bi-og-

AUTORIORATEX, do to to properly (ki lus, life; and grapho, I write), is a big of a person, written by histociff. If a biography be interesting and materiality on is a well-written autobiography. In case the actions of the individual are look distance, and their motives indicated at in the latter the actions are at hand, a are in general well known. In the last how the man himself viewed his artis in the former, how they appeared a almost impossible, and, perhaps, that autobigrapher should disclose with partiality the whole particulars of his Hithereal motives of his actions; but swite to conceal them becomes of itself a si closure. He betrays himself when he it, and the more cautious he is to come nesses, the more manifest do they appearments of an autobiography he in ris is success and complete as possible. In this comes valuable in a psychological point of throwing light upon the mental conditions In this Among the most celebrated works of this ' (onlessions ' of St. Augustine and Ro autobiography of Gothe (Wahrheit und a work of this class, is of comparatively i

as what of the class, is of comparatively active the and as it as believed to partiake too much of the element. Inother kind of autobiography is which the writer does not so much relate the of his own lit, as that of the person with whom he came in contact.

Attoceact, is tok-rase (Or assus, self; power), is that form of government in whi a verieng exercises uncontained in wand the a verieng exercises uncontained in the state and executive powers of the state. Alm at all feature states have the form of government—in Phil, the term is used by Rant to denote the mastery of the reason over the rebellious propensities

ALTOCRAT, an to knit (Gr. autos, selfe kratos, power), a person vested with absolute independent power, a sovereign who rules uncontrolled. The title was first given by the Athenians to a commander. me-chief vested with underputed powers, and not habe, like others, to be called to account at the assigny of his office. The title was afterwards seamined by the Byzantue emperore, and, at present, the ampeture of Russia bears this title

AUTO DA II (See ACT OF PAITH.)
ALTOGINOLS SOLDERING (See SOLDERING, AUTO-GINDUS )

Autogram, an' the graff (Granton, and grophs, I write), is a term applied to what is written by a person's our hand, an original manuscripp; as opposed to an apograph or copy Autographs, particularly of celebrated persons, have in recent times become objects

of eager pursuit, and form a breach of literary trade. The autograph of that spare now in the British Museum cost £100; that in the library of the city of London

£158. In general the value of an autograph depends upon the eminence of the individual, the scarcity of specimens of his handwriting, and the contents of the writing. Lithography has been vary useful in affording the means of making farshmilts of autographs. The first English work in which a sense of farshmiles of autographs appeared, was six John Fenn's "Original Letters from the Archives of the Paston Family," 1767. Among the best works of this base are "Autographs of Reval from the Archives of the Paston Family, 1787. Among the best works of this class are, "Autographs of Royal, Noble, Learned, and Bennarkable Personages conspicuous in English History from the Reign of Richard II. to that of Charles II.," by John Gough Nichols, folio, 1825; "Iconographe des Hommes Celèbres," 3 vols, Paris, 1828-39. Supplement, 1839; "Autographen-Prachaltenn zur 220 jährigen Gedächtnissfeier des Westläugens Friedenschlusses," folio, Leipsic, 1848. Lavater believed that the character of an individual was shown by his headwriting; and recently persons have professed to be able to determine characters in this way. There are, however, generally so many circumstances that have an influence in forming one's handwriting, Independent of self, that it is but seldom that it can allord much insight into character.

Autowaturn, 222-221.

ATTOMACTER, and dom'd-life, a species of corundum, found in octohedra. It consists principally of alumina and axide of sinc, and generally occurs associated with

zinc-blende and glauce.

Arronting Actions, aw-to-mell-ik, is a term applied in Psychol. to certain nuscular movements which are influenced simply by sensation, and not at

all by the will; as winking.

AUTOMATON, aw-tom'-a-ton (Gr. autos, self, and mao, I move, a machine so constructed as to move in imitation of the actions of living animals. The term assisted (from the Gr. aner, a man) is also applied to pieces of mechanism built in the form, and initiating the motions of men. The ingenuity expended upon some of these remarkable contrivances is very surprising. Four hundred years before the Christian era, Archytas of Taranum is said to have constructed a wooden pigeon that could dr. Albertus Magnus made an automaton to open his door when any one knocked. The speaking head of Roger Bacon is a familiar tradition. Region montanus invented a wooden eagle, that flew from the city to welcome the emperor's return, and an iron fly, that flew about the room, and then returned to his hand. These ancient instances are no doubt exaghand. These ancient instances are no doubt exag-gerated, if not entirely untrue; but, in modern times the construction of many extraordinary automata has been well authenticated. The flute-player of Vaucanson is fully described by M. d'Alembert in the Ency-clopédic Méthodique, art. Androide. It was exhibited in Paris in 1738: It played on the flute after the exact manner of a hying performer, and commanded three octaves, the fallest scale of the instrument, containing several notes of great difficulty. Its height was nearly six feet, with a pedestal, in which some of the six teet, with a penessal, in which some of the machinery was contained. Two automaton flute-players, of the size of life, were exhibited in this country some years ago. They performed ten or twelve duets. M. Camus constructed an automaton group for the amusement of Louis XIV. It consisted of a coach and horses, with a coachman and page, a lady inside, &c. When opposite the king, the horses stopped, the page got down and opened the door, the lady slighted, presented a petition, and re-entered the carriage; the page then shut the door, the carriage carriage; the page then shut the door, the carriage drive away, and the servant run after and jumped up behind it.—(Ref. Hutton's Mathematical Recreations, vol. fi. p. 35.) In 1741 Vancanson produced a flageolet player, which beat a tambourine with its right land while it played the flageolet with its left. He also constructed a duck, which ewano, drank, dubbled in the water, and quacked like a real dack, raised and moved its wings, dressed its feathers with its bill, took barley from the flash, awallowed it, and even digested its food by means of materials provided for its solution in the atomach. The investor made no accord of the in the stomach. The inventor made no secret of the machinery employed. Macket, the inventor of the metromone, exhibited an automaton trumpeter at Vienna, which is described in the Journal des Modes for 1809. It was a martial figure, attired as a trumpeter of the Austrian dagure, attired as a trumpeter of the Austrian cavalry march, and all formality. The pulp obtained by the chawter, who the signals of that army, but also a march and an

altegro by Weigi, which was accompanied by the whole crohestra.— (Ref. Dichesory of Musiciana, London, 1837) Many other automats are described by Hutten, one of which they Microsees, another physical on the planefortef &c. The farnous chose-playing automaton pranaforter ac. The farnous cheen singing ameniation is considered a solved mystery,—a boy was concealed inside the figure. The last remarkable automatic group was exhibited in London in 1806. A membey capped his jaws together as he held a violin; a hare browsed upon a cathere; a gost uttered an audible cry; a child that had been sleeping in a cradle woke upon as a solvent of the large and state of the cry; and sta unls, except the child, which was a failure

AUTONOMY, aw-ton'-o-me (Gr. autos, sell, spd nomos law), denotes that kind of government in which the citizens of a state make their own laws and manage their own public affairs. In Phil, the term was used by Kant to denote the severeignty of reason over all our actions, as opposed to beteronomy, in which our soldons are directed by motives or desires contrary to the dictates

of reason.

Autorsy, aw-top-se (Gr. autopma, fish, bulos, self, and opsis, sight), denotes personal observation, and is applied to the knowledge which one sequires by center observation, in contradistinction to that which is communicated to him by the accounts of others.

AUTREPOIS ACQUIT, of r(e)'-finaw ak-e' (fr., previously acquitted), in Law, is a plea by a person indicted of a treason or felony, that he was heretofore acquitted at the same treason or felony; for no one shall be brought. into danger for the same offence more than once. An acquittal upon an indictment for murder may be pleaded in bar of another indictment for manaleughter, because the defendant might have been convicted of manslaughter on the first indictment. On this piea, incases of felony, the prisoner must plead over to the felony at the same time, so that he may be tried for the latter if the former be not allowed. In cases of misdemeanours, as the defendant cannot plead over, the judgment upon a plea of antrefois acquit, which is inbar, is final, and sentence will be pronounced against him, if the plea be not sustained.

AUTREFOIS CONVICT (Fr., previously convicted). A man convicted of an offence may plead such conviction in bar of any subsequent indictment for the same

offence of which he was convicted.

one nee of which he was convicted.

AUTUIN, act lim (Lat. adamnus), is the name of one of the four sensons of the year,—that in which the fruits of the earth are gathered in. Astronomically, speaking, it is the period during which the sun is passing from the autumnal equinox to the winter solsting (from 23rd September to 21st December). The inhabitants of the couthern hemisphere have spring when those of the northern have autumn.

AUTUMNAL EQUINOX. (See EQUINOX.) AUXILIARY SCREW. (See SCHEW-PROPELLER.)

AUXILIARY VERBS, aux-il'-ya-re (Lat. auxiliari, to help or assist), in Gram., are those helping verbs by which other verbs are principally conjugated. They are also termed relational verbs, as denoting the relations of action, and as distinguished from notional verbs, which imply notions of action. They are divided into auxiliary verbs of tenses, and auxiliary verbs of mood. The modern languages, particularly our own, abound in such forms; and the ancient languages of Greece and Rome were not without them.

a'-ra, an intoxicating liquor used by the South-Sea islanders. It is also known under the names of Cava and Arva. In Tahiti, the use of it is said to have swept off many of the inhabitants. In the Tonga islands it is prepared and drunk on every festive occasion; and in the l'espe islands the preparation of the king's morning drink of ave is one of the most solemn and important duties of the courtiers. The use of ava was forbidden in the Sandwick salands

## Avalanche

thrown into a bowl and mixed with cold water. After this mess has stood for a little while, the liquor is strained from the chewed fibre through concarnal husis, and is then ready for use. Professor Johnston, in describing the preparation of ava, suggests that the salive may produce a chemical charge in the ingredients of the root, and that the intoxicating properties of the liquor may depend, in some measure, upon such change.

Avatancie, av-d-lanck (Fr., from the Lat. ad, to, and calles, valley), an accumulation of snow descending from the precipitous slopes of a high mountain into the valley below. Avalenches generally result from the partial melting of the snow in spring. The carth, warmed by the rays of the sun, melts the under layer, and thus destroys the adhesion of the mass to its surface. The least agitation of the air will some-times cause the fall of an avalanche; and for this reason experienced Alpine travellers generally preserve strict silence when in the neighbourhood of dangerous masses of snow. In Switzerland avalanches are common, and sometimes destroy entire villages. thinds of avalanches are distinguished. A drift avalanche consists of loose and powdery snow, set in motion by a strong wind; a rolling avalanche is that produced by a detached mass of snow rolling down the steep, and ficking up the snow over which it passes; a sliding avalanche consists of an immense mass which has lost its adhesion to the surface through partial melting; lastly, a glacial avalanche is that made up of musses of frozen show and ice from the higher regions of the mountain.

AVANTURINE, a-vant'-u-rine, a chocolate-coloured -variety of quartz, containing spangles of gold-coloured tariety of quartz, containing spangles of gold-coloured wides, which give it a peculiar play of colour, as if metallic particles were dispersed through its mass. It is now made artificially by mixing copper fittings with glass while in a state of fusion. Artificial avanturing is far more lustrous than the real mineral. Avanturing the state of the state o more assessed than the ren more at Avan-turine felspar owes its glitter to particles of Titanic iron. "The name Avanturine," says Jackson, in his "Minerala and their Uses," "is said to be derived from the following circumstance:—A French workman baying by accident, or paraventure, dropped some copper Illings into a vitreous mixture in fusion, gave the name Acadurine to the sparkling mass which was thus produced; and it is still by a similar process, though greatly improved, that the artificial production is now manufactured, to be employed for various ornamental purposes. The artificial far exceeds in brilliancy the natural avanturine. A species of avanturine is also produced by heating pieces of quartz to a certain degree and suddenly cooling them; this occasions a number of minute fissures in the mass, which, by the unequal refraction of the light, gives the stone the desired appearance."

AVARI, or AVARES, a-vair'-i, in Early Hist., is the name of a Mongolian race that, about one hundred years after the Rugarians, made their appearance in the countries about the Don and Volga. They have been conjectured to be the Aorsi, or Adorsi, of Strabo. A portion of them remained at the Canessus, while another portion of them, about the middle of the 6th century, passed on to the Danube, and settled in Ducia. Here they served in Justinian's army, assisted the Lombards to destroy the kingdom of the Gepide, and gradually conquered, towards the end of the 6th century (especially under the powerful king Bajan), the region of Pannonia. Afterwards they conquered Dalmatia, made devastating incursions they conquered Baimatia, made devestating incursions into Germany as far as Thuringia, and into Italy, where they combated the Franks and Lombarda, and extended their dominion over the Sclavonians, dwelling on the Danube and morthwards, as well as over the Bulgarians on the Black Sea. At Length, these various nations rose against them, and, in 649, drove them out of Dalmatia. Confined to Pannonia, they were substant of Charlestonia. of Dalmatia. Confined to Pannonia, they were sub-dued by Charlemagne in 796, and afterwards were nearly extirpated by the Moravians and Petscheneges; so that after 827 they disappear from history. They were wont to surround their settlements with circumrellations of stakes and earth, of which in the countries which they inhabited, traces are still to be seen, and are known by the name of Avarian rings.—Not. Brookhaus' Converse ons-Lexikon.

#### Avena

Avast, a vast' (Ang. Sax.), in Mar., is an order to stop or pause in any exercise; thus, seamen use the phrase "syst heaving," to desist from drawing in the

phrase." avast heaving," to desist from drawing in the cable or hawser by means of the capstan.
Avaria, a'-sa'dur, in Hindoo Myth., is applied to the incarrations of the deities, or their appearance in some manifest form upon the earth. The word is Sanserit, and properly signifies a descent, or the act of descending. The number of avatars related of Vishnu and the other deities is very great.—Ref. English Cyclamatia—Arts and Sciences. padia-Arts and Sciences

AVELLANE, ac-el-luin (Fr. avelline; Lat. avellana, a filhert-nut).—In Her., the name given to a peculiar form of cross composed of four hazel nuts or filberts inclosed in their perispermium or shell.

AVE MARIA, ai'-ve ma-ri'-a (Lat., Hail Mary), a prayer of the Roman Catholic church to the Virgin Mary, so called from the words with which it commences. It is also called Angelica Sulutatio, or the Angelic Sulutation; these words being the beginning of the salutation which the angel addressed to Mary, as he announced to her that she was to be the mother of the Saviour. The invocation was first used by the priests during mass on the fourth Sunday after Advent, by an ordinance of Gregory I. With the extended worship of the Virgin since the 11th century, the Ave Maria has come to be a lay prayer nearly equal in use with the Peter Noster, and was sanctioned as such at the end of Pater Noster, and was sanctioned as such at the and of the 12th century. In the first half of the 16th century the prayer came generally to receive, as a conclusion to the earlier formula, the words "Holy Mary, mother of God, pray for us sinners, now and at the hour of our death. Amen." John XXII., in \$226, ordained that every Catholic should, at the ringing of the hells, morn-ing, noon, and night, repeat three aves. The aves are ing, noon, and night, repeat three aves. The aves are reckoned by the small beads of the rosary, which are hence culted Ave Marias, while the large beads are used in the Pater Nosters. To this custom Byren alludes in the following beautiful lines:

" Ave. Maria! blessed be the hour, The time, the clime, the epot, where I so oft Have felt that moment in its fullest power Sink o'er the carth so beautiful and soft: While swing the deep bell in the distant tower, Or the faint dying day-hymn stole aloft,— And not a breath crept through the rosy air,
And yet the forest leaves seem'd stirr'd with prayer.

AVENA, &v-e'-n", in Bot., the Oat, a gon. of grasses (nat. ord. Graminacca). A sativa is the botanical name for the common oat, many varieties of which are cultivated in the north of Europe for the grains. Oats are extensively used as food for man and domestic When deprived of the husks, and coarsely animals. ground, they form outment. When merely directed of their integuments, they are called groats; and these when crushed constitute Embden and prepared groats. Oats are also employed for the production of alcohol. The recent experiments of Professor Buckman, of the Royal Agricultural College, show that the cultivated varieties of the out are derived from the wild out, A. fatura. This parent species attains the height of from three to five feet, and is a mischievous weed in corn-fields. The seeds are covered with stiff bristles of a brown colour, and each is furnished with a long bent awn. About ten years since, Professor Buckman collected some of these seeds, and in the following spring commenced the cultivation of the wild oat in the experimental plots of the Royal Agricultural College. Year by year the seeds were saved, and the interesting transformation of a weed into a productive cereal grass was traced through all its successive stages. In the first year, a lighter-coloured fruit was obtained; in the second, the fruit exhibited a less degree of hairness; in the third, a greenish, straight, and slender awn took the place of the black rigid one, bent at right angles, which characterizes the wild plant; in the fourth, the fruits were much more plump, owing to the greater development of grain; in the fifth year, the ripe fruit separated from the floral envelope less readily than in separated from the norm entering the reservation the case of A. fatua. These changes were reported in 1855, and the professor was encouraged to continue his experiments for a few more seasons. Accordingly, in the spring of 1856, seed, the produce of the pre-

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ceding year, was sown in a propared bed, and the result was a large admixture of two forms or types of crop-oats, one with the flowers all round the stem, the potatio-oat form of the farmers, and the other with the flowers all drooping to one side,—the so-called Turtarian oat. Since then, Professor Buckman has grown the two sorts so derived, in the field, and with a gradual improvement in point of productiveness and weight per bushel. The same acute observer has lately watched the production of wild oats as a gradual degeneration from cultivated ones. The hairy sceds of the wild oat are sometimes used by anglers instead of artificial flies.—Ref. Buckman on Corn, in Popular Science Review.

Science Review.

AVANGER OF BLOOD, d-ven'-jer.—In the early ages, the penalty of death for the crime of murder was not inflicted by any legal tribunal or public authority, but it was considered the duty of the most immediate relative of the victim to hunt and slay the murderer. The Hebrew word Good signified the avenger of blood; it had also a wider signification. The Mosaic law placed this recognized institution of the rude social condition of the times under certain regulations, prohibited the murderer from purchasing by money a ransom for his tife, and appointed cities of refuge for the manslayer not guilty of positive murder. The doctrines of the Koran permit the avenging of blood by the nearest kinsman, but allow him to receive money as a com-mutation for the murder. The Arabs follow the primitive custom to this day. Hereditary feuds of class; families, and tribes, have always originated in the avenging of blood, of which the Vendetta of Corsica is the most modern and familiar example in

AVENUE, av'-c-nu (Lat. ad, to, venio, I come), an opening, entrance, or passage, by which anything may be introduced. The term is also used in landscapegardening, in order to distinguish the path leading from some other road, and forming the direct approach to a house. Any broad walk or road, bordered on either side with trees, is also called an avenue. In the latter case the trees may either be in rows on the sides or in clumps at some distance from one another. The trees mostly used in England for avenues are the English elm, the lime, the horse-chestnut, the common

enguan eim, the time, the horse-chestnut, the common chestnut, and the beech. A wide straight street is also called an avenue, as in Washington, in America.

AVERAGE, GENERAL, äv-e-rij (Fr. avoir, to have or possess), in Com., whatever loss or damage is incurred by any portion of a ship or eargo for the preservation of the rest. When such damage accrues, the several persons interested in the vessel, freight, and cargo, each contribute their proportion to indemnify the owner of the part in question, against the damages or expense which has been incurred for the general bene-It is understood that this allowance is for loss or damage that happens accidentally, and is not a voluntary and purposed loss or damage. General average also implies that the whole adventure has been in jeopardy. Every description of loss incurred on any portion of a cargo during a voyage is denominated average, or, sometimes, particular average.

AVERROA, in-er-ro'-a, in Bot., a gev. of plants belonging to the nat. ord. Oxalidacea, and consisting of two species, both being small trees growing in the Bast Indies. They produce sour fruits, which are much eaten by the natives, but which are not relished by Europeans, except when in pickles. The botanical names of the species are A. bilimbi and A. carambola, and the fruits are known respectively as the Blimbing

and the Carambole.

AVES, ai-veez' (Lat., birds), in Nat. Hist., the second

class of vertebrata. (See Brins.)

AVIGENSIA, är-i-sen-ni-a, in Bot., a gen. of plants belonging to the nat. ord. Myoporacea. The species The species are natives of Australia and America, and grow, like the mangroves, in salt marches. In a proven me the mangroves, in salt marches. The bark of A. tomentosa, commonly called the white mangrove, is much used in Brazil for tanning. A. resinifera, which grows in New Zesland, yields a green resinous substance, which is eaten as food by the natives.

ANUTLE MARKET AND A MARKET OF TRAINS COMMITTEE.

AVICULA, & vik'-u-ld, a gen. of marine conchifers, the shell of which is imported in considerable quan-

real commercial value, however, of this peculiar oyster rests on the real pearls often found in its interior. AYIOUDORECTR, and wid-ul-p-get-ten, in Good, a gen-of fossil bivalve mollusks, peculiar to the carboniferous

imestone and often so well preserved that even the colours of the living shell are retained.

Avocado Pear. (See Persea.)

Avocado Pras. (See Persea)
Avocat, de e-ke (Fr., from Lat. ad, to, and vocare, to call).—An advocate in French law answers, in some measure, to a barrister or counsel in ours, with this difference, that the latter cannot, according to the etiquette of the English bar, undertake any matter or cause in which his advice or assistance is required. except through the instructions and retainer of a solicitor or attorney; whereas an avocat corresponds with his client, and acts in the double capacity of counse!

and attorney. (See Barrister, Courski...) Avocst, or Avosstra, &-o-set.—The chief peculiarity of this squatic bird is the form of its bill. It is very thin, flexible, of a substance like whalebone, and turns hookwise, but in an opposite direction from the hawk and other tribes. The plumage of the svocet is black and white. Buffon makes the hird's bill a subject for lamentation on the blundering of Nature in so ill providing a creature with a means of sustenance. Mudic, however, takes a contrary and a proper view of the matter, and demonstrates that for scooping, probing, and heating the water, while the mandibles act as a trainer and retain the finny prey, the avocet's bill is most admirably adapted. A few years ago, and in the fen-bird season, it was no uncommon thing to find the avocet in the London poultry-market; now, however,

Avoidance, accel-dans (Ang.-Nor.), in Law, in the general signification, is where a benefice is void of an incumbent, in which sense it is opposed to plenarty.

(See BENEFICE.)

Avoiduptors, or Avendurois, de-or-du-poic' (pro-bably Fr. avoir du poids, to have weight), the name given to the system of weights used both in England and America in general commerce. The ounce conand another areas whereas the ounce in both troy and anotheraries weights contains 480 grains. There is fortunately but one grain which may be taken as a common unit in comparing the three systems of weights used in Britain. The value of the grain is set forth in the act of parliament 5 Gec. IV. c. 74, in the following words:—"A cubic inch of distilled water weighed in air, by brass weights, at the temperature of 62° of Fahrenheit's thermometer, the barometer being at Fahrenheit's thermometer, the barometer being at 30 inches, is equal to 252 grains and four hundred and fifty-eight thousandth parts of a grain." The pound avoirdupois' contains 7,000 such grains. The lowest term in avoirdupois weight is the dram, which contains 2733 grains. The dram is, however, seldom, if ever used now, small weights being expressed either in grains or in fractions of the ounce. The following table displays the comparative rather of the different displays the dis displays the comparative values of the different denominations in avoirdupois weight :-

The usual contractions are as follows:—ounce, oz.; quarter, qr.; pound, lb.; hundredweight, cwt. There is a very useful rule for reducing a large number of is a very userin rule for reading a large states of pounds to hundredweights roughly, which may be given here. This rule may be thus briefly expressed :—From all but two figures take all but three. Example: 17,034 lbs. contain 159 cwt., the sum being got at thus:—

176 (all the figures except two)
17 (all the figures except three)

When the number of hundredweights exceeds 100, the error can never be greater than two. In compounding and prescribing medicines, and in weighing the precious metals and precious stones, other systems of weights are used. (See APOTHECARIES' WEIGHT, TROY.)

Avicula, a circulate a general marine conchifers, the shell of which is imported in considerable quantities, and used, under the name of mother-of-pearling at the construction of buttons, knife-handles, &c. The

constitute an award; it is sufficient if the arbitrator express by it a decision upon the matters submitted to him. If the matters are submitted to the determination of two or more arbitrators, the award should be executed of two or more armprators, the award should be attended by all, at the same time, and in the prespice of each other. The award must be made within the time limited by the order, bond, or agreement of reference, or within such enlarged time as the arbitrators may fix, in cases where such power is reserved to them. The publication of the award dates from the time of The publication of the sward may be set aside if it appear manifestly, from the merits, that the arbitrators have acted dishonestly or corruptly; but not if the decision be contrary to law, unless the mistake appear on the face of the award or of another paper delivered with the court act acid an award absolutely. ice of the award or of saide an awards absolutely void or doubtful, unless it is capable of being enforced without suit, but will leave the party to his action upon it. The following are the usual grounds upon which an award may be set aside:—1. That the arbiwhich an aware may be easiled. The contract where have not pursued the submission in every material point, or have in any other respect exceeded their authority; 2. that the award is uncertain or ambiguous; 3. that it is not final, either by reason of not deciding all the matters referred, or otherwise making subsequent proceedings necessary; 4. that it is inconsistent; 5. that it is illegal; 6. that the proceedings were irregular or fraudulent; 7. that the arbitrators have misconducted themselves; 8. that it arounds an the fine of the award that the arbitrators have mistaken the law; 9. that it is had in part not separable from the residue. The performance of an award may be enforced,—I. By action, where there is no cause in court, or the instrument of reference does not contain a clause that the submission shall be made a rule of court; 2. where the submission contains such a clause, by action, attachment, or execution, as the practice of the court in either case may warrant. An award must be stamped with the following duty:— where the amount or value in dispute shall not exceed £50,—2s. 6d.; £100,—5s.; £200,—10s.; £300,—15s.; £750,—£1; £1,000, and in all other cases not provided

for, £1. 15s. (See Arbitration.)

A. WRATHER, weth'-er (Ang.-Sax.), in Mar., a term signifying that the atuation of the helm is to the weather side of the ship, in contradistinction to a-lee.

weather side of the sinp, in contradistinction to a-tee.

Aweigh. (See Arista.)

Awning, awn-ing (Gothic, halyan, to cover), in

Mar., a canopy of canvas or tarpaulin spread over a

boat or the ship's deck, as a protection to officers

and crew against too great solar heat, or to preserve the deck. The awning is generally supported by a range of light posts called stanchious, erected along the right and left sides of a ship: in the middle it is supported by a complication of small cords called a crowfoot. The term is also applied to that part of the poop dock which is continued forward beyond the bulkhead of the cabin.

Axe, ar (Sax. aex), an iron instrument, generally used with both hands in hewing timber and chopping wood. It consists of a head with an arching edge, and a handle. There are several forms of the axe, the two principal being the broad axe for hewing, and the narrow axe for cutting and rough-hewing. The hatchet is a smaller form of the axe, and is used with one hand. AXE-STONE, a green variety of jade found in New Zealand and on the banks of the Amazon, and used by

the natives for making hatchets.

ATH, ATHLEARY, ax-il (Lat. axilla, armpit), in Bot., the upper angle formed by the leaf with the stem is called the axil, and everything arising at that Dark and a stem as a stem and a stem as point is said to be axillary. Buds are usually axillary. Anything springing from the stem, either above or below the axil, is extra-axillary; if above, it may be described as supra-axillary; if below, as infra-

AXILLA, ax-il'-la (Lat.), is applied in Anat. to that cavity under the upper part of the arm called the armpit. Hence the term axillary is applied to the

armpt. Hence the term aximary is applied to the arteries, roins, glands, &c., of this part.

Aximize, &x-e-nile (Gr. axine, an axe), a variety of garnet found in mice-clost in Dauphine and Cornwall; so called from the axe-like form of its crystals.

Axiom, &x-i-om fir. axioma, worth, authority), is

properly a self-evident proposition of a theoretical character. It was originally applied to geometry by Aristotle, in which science it means a proposition which it is necessary to take for granted; yet Euclid did not employ the term. What we now call axioms were denominated by him common notions. It came into protty general use in the 17th century in this country. A consideration of the reasoning process is sufficient to indicate the necessity for general axioms; for whether we deduce or induce we must either for, whether we deduce or induce, we must either begin with the indemonstrable or end in it. Lord Bacon himself employed the term axiom to denote an empirical law, gained by an induction from particulars. This use of the word is somewhat ifregular. In any process of demonstration, the deduction of propositions from the comparison of other propositions must begin somewhere, so that there must be at least two propositions to begin with, whose evidence must be derived from other sources than reasoning. They must at last fall back upon the native intuitions, or instincts, or data of the mind for these first principles or axioms of all reasoning. Every attempt which has been made to dispense with these primary data of consciousness has failed; and the persons who have made the attempt have only been wiled on to their own destruction by some subtle paralogism. The axioms, or, more properly, the "common notions," employed by Euclid in geometry have been for the most part employed by other writers and are obviously constructed with no fall back upon the native intuitions, or instincts, or other writers, and are obviously constructed with no very close regard to the distinctions of metaphysics. very close regard to the distinctions of metaphysics. Among them, or attached to them, we usually include the postulates, or things demanded to be done. The whole of these axioms of geometry may be conveniently divided into three classes,—1. Those in which the truth is asserted in the direct meaning of the words employed, and which it is impossible to deny until the meaning of the words is altered. Such are the 8th and 9th of Euclid's axioms. 2. Those which are true of 9th of Kuclid's axioms. 2. Those which are true of all magnitudes and spaces alike, with no exclusive reference to geometry. Such are those from 1 to 7 of the axioms of Euclid. 3. Those which have a direct bearing on geometry itself; as the three postulates and the last three axioms of Euclid. Many other assumptions are to be met with in the reasonings of Euclid not to be found in this formal announcement of the axioms or common notions. But these are so trivial, that no one, except a close scientific reasoner, will be likely to find fault with them, if he can discover them at all. Every science has its axioms, elementary principles, or leading ideas, around which all the rest gravitate as towards a centre. This is essential to the existence of any body of knowledge, without which it would crumble down into a series of empirical details.

Axis (Lat., a pole, or axle-tree), a term common to all the sciences, being applied to any line about which objects are symmetrical, around which they turn, or to which they have some common relation. In Astron, the term is applied to an imaginary line passing through the centre of a heavenly body in a direction perpendicular to the plane of rotation. The axis of the earth is that diameter about which it revolves with a uniform motion from west to east. The poles of the earth are the points where the axis meets the surface. The sphere of the heavens, that is the imaginary spherical surface of infinite radius of which the earth it has been presented to be a surface of the sphere of the surface. is the centre, necessarily appears to revolve about the same axis, but in an opposite direction. The poles of the heavens are the points of this imaginary sphere to which the earth's axis is directed. The axes of the which the earth's axis is directed. horizon and equator are lines drawn through the cenhorizon and equator are times around not carriers of these great circles, and at right angles to their planes.—In Bot., the term axis is applied to the central part both above and below ground, around which the whole plant may be said to be arranged. The stem is called the ascending axis; the root, the descending axis. -In Geom., the word axis is used to denote a right —In Geom., the word axis is used to denote a right line around which a plain figure revolves to produce a solid. Thus, a semicircle, by moving round its diameter, describes a sphere, the axis of which corresponds to the diameter: a right-angled triangle, by turning round on its perpendicular, in like manner describes a cone, of which the axis is that perpendicular. The word is generally employed to designate a line which we may conceive to be drawn from the summit of a regular figure to the centre of its base.—In Phys., the

word is used in many different senses. The axis of a lens is an imaginary tine joining the carie of a telescope opposite surfaces of the glass. The axie of a telescope or microscope is a right line which passes through the centres of all the louses in the tube. The axis of the eye, or visual axis, is the right line passing through the manner of the number of th lens is an imaginary line joining the centres of the two opposite surfaces of the glass. The axis of a telescope eye, or visual axis, is the right line passing inrough one centres of the pupil and crystalline lens. The axes of a crystal are imaginary lines, about which the planes are symmetrically arranged. The axis of rotation is the line around which a body turns when revolving. The axis of oscillation is a line passing through the point about which an oscillating body—a pendulum, for in-

Axis Deen, ax'is (Cerras axis), a deer peculiar to Instance—makes its vibrations.

Axis Deen, ax'is (Cerras axis), a deer peculiar to India. It is about the size of the fallow-deer; its ground-colour is pale red; a white line rans along its sides, dividing the under from the upper parts of the body, which is prettily spotted with white spots. Hunting the axis is a favourite sport, and its flesh is esteemed

a great dainty.

ALLE-TREE, dx'-l-tre (Sax. ax, and tree), a piece of timber, or bar of iron, fitted for insertion in the hobs or naves of wheels, on which the wheels turn. Since the general use of locomotives, elaborate inquiries have arisen among engineers as to the theory of axles, Mr. Yorke, in 1843, contended for the superior strength of hollow axles; but his opinion is disputed by others. Among the recent improvements in form and mechanical action, may be mentioned Hardy's patent axles, which have shown such a remarkable degree of toughness that, in 1849, the privy council granted a continuation of the patent. In a treatise on railway axies, Mr. Bessemer attributes the cause why the axies of railway carriages break more frequently than those of a road carriage, in spite of the fact that the one go upon smooth rails while the other pass over rough and uneven surfaces, to the oscillation of a railway carriage, and proposes the use of a compound axle so formed that its two halves may yield a little during oscillation, Rowair's patent axles were invented to reduce the amount of friction usually excited by the action of the wheel. For the axle in common use is substituted a small centre-revolving arm, along which are fitted five or six rollers closed at each end: the shouth over the small roller revolves with very little friction. The arm is turned truly parallel, with a bevelled shoulder to fit a corresponding bevel on the rollers, and a screw-nut is fitted in the extremity of the arm, having also a beveiled shoulder. The rollers are fitted into and carried by two rings in such a manner that they are perfectly free to move on their centres, and, when placed on the arm, are free, also, to move round it without lateral motion, being confined by the bevels. By this contrivance the bearing is transferred to the

By this contrivance the bearing is transferred to the surfaces of the rollers, and does not affect their centres.

AXOLOTI, dx'-o-latt (Siren pixelformix), an amphibious animal, chiefly peculiar from possessing, at the same time and always, both gills and lungs, thus enabling it to breathe air and water, according to pleasure or exigence.

It is about 9 inches larger hand, broad a longer hand, broad and always.



thickly mottled with small black spots. The axoloti is very AXOLOTL. common in the lakes of Mexico, and, according to Humboldt, likewise inhabits the cold waters of mountain lakes at much greater elevation above the level

the tail long as

of the sea than the plains surrounding that city. Dressed after the manner of stewed ecis, it is sold commonly in the market-places of Mexico. Axотомога, äx-ot'-n-mus, in Min., a term applied to

minerals cleavable in the direction of their axis.

AXE-AXE, ai-ai (Cheioromys madagascariensis). --This animal, in many accounts confounded with the ai,

or sloth, has lately attracted much attention, and is now regarded as a connecting link between the Rodents and the Quadrumana. When first discovered, it was supposed to be a species of squirrel. It burrows underground, and is altogether a nocturnal animal. It has large flat bat-like ears, and its tail is long and bushy.



AYE-AYE.

Each fore-hand has five fingers, the third being singularly attenuated, and provided with a strong claw. The hind-legs are also furnished with preheasile hands. The entire body is clothed with long smooth hair, beneath which is an under-coat of a woodly nature. It measures about eighteen inches from nose to tail, and is found only in the forests of Madagascar, where it feeds on worms and insects.

AVUNTAMENTO, a-joon-ta-men'-to, is the name given in Spain to the councils or governing bodies of the towns and villages. This has ever been the most cherished and carefully-preserved institution of the Spanish people; and its existence may be traced to the earliest period of their history. In 1512 much of its influence was lost, and under the Bourbous it was entirely taken away; but, in 1812, the leading features of the old system were rectored by the Cortes. On the return of Ferdinand VII. the synotamentos were abolished; but they were again restored by the Cortes in 1823. During the civil was they were once more set aside; but in 1837 the constitution of 1812 was restored. attempt made in 1840 to restrict their powers led to the expulsion of the queen; but the measure was carried in 1844, by which their functions are limited to municipal matters.

AZALEA, a-zui'-le-a (Gr. azaleos, dry, arid,-the habitat of the plant), in Bot., a gen. of plants belonging to the nat. ord. Ericacca, sub-ord. Rhododendrew, and consisting of shrubs remarkable for the beauty and fragrance of their flowers. Many of the species are extensively cultivated as ornamental plants: of these, the most common is A. pontica, a shrub from three to five feet high, with orange, red, or nearly white flowers. It is a native of the countries around the Black Sea, growing luxuriantly on the mountain-slopes, and often giving great brilliancy to the landscape. The whole plant is narcotic, and Trebizond honey owes its poison-ous properties to the bees feeding on the flowers. The poisonous honey mentioned by Xenophon in his account of the "Retreat of the Ten Thousand" was of a like nature. Some of the finest species in cultivation are natives of North America: of these, the most deserving of notice are A. maisflara, called, on account of its sweet odour, the upright honeysuckle, and A. viceosa, which, with A. pontiar, have become the parents of numerous beautiful hybrids. The delicate azulca of the greenhouse, A. indica, is, as its name implies, a native of India. This species has lately met with a rival in

#### Azimuth

A. lodifolia, an evergreen, which has been brought to this country from China. The azaleas are closely allied to the rhododendrons.

AZIMUTH, id-c-muth. (Arab. al samt, the way, tract, or quarter).—The azimuth of any heavenly body is the angular distance between the north or south point of the horizon and another point in the same, where it is cut by a vertical circle, or circle of altitude, passing through the heavenly body itself and the zenith of the observer. It is taken by aid of an altitude and azimuth instrument and a theodolite. The term azimuth circle is sometimes applied to vertical circles, the planes of which are perpendicular to the plane of the horizon. The magnetic azimuth is the augular distance between the point ir. the horizon cut by the azimuth circle of any heavenly body and the meridian of the magnetic pole. The sun's magnetic azimuth is found at sea by means of an azimuth compass. (See Compass.) An azimuth, or analemmatic dial, is one in which the dialplate is parallel to the plane of the horizon, and the gnomon, or stile, at right angles to it: the hour-points

are marked in the periphery of an ellipse.

Azonenzine, d-zo-bon'-zide, a substance obtained by the action of an alcoholic solution of potash on ni-It crystallizes in large reddish-yellow crystals. It must not be confounded with nitrobenzole or nitrobenzide, which is benzole in which an atom of hydrogen is replaced by an atom of peroxide of niatom of nitrogen only.

Azolitium, azolitium, the principal constituent

of litmus: it is amorphous, of a brown-red colour. is insoluble, or nearly so, in alcohol and water, but dissolves readily in ammonia.

Azore, az'-ote (Gr. a, not, and zoe, life), the old name for nitrogen. Nitrogen was so called from being destructive to life; but as numerous other gases have the same properties, the word has been almost given up by English chemists, except in such words as azolized, azolienzele, &c. The French, however, still use azole. azolique, azotate, &c., for nitrogen, nitric neid, and

AZIEC CHILDREN, äz'-tek .- In 1853 two children, a boy and a girl, were brought over to this country from America. Their ages were said to be respectively seventeen and eleven; but their appearance warranted a supposition of their being much younger. Their height was not three fort. Their figures were slight and well-proportioned, and their faces of remarkable peculiarity. Their foreheads and chirs receded almost abruptly, and their noses, which were of the Jewish type, were singularly prominent. Their eyes were dark and expressive, and their complexions a transparent olive-colour. They possessed from minul spirits, and were fond of music. They were exhibited to the public as curiosities, and attracted a number of spectators. They spoke no known language, but under-stood a few words of English. The exhibitor repre-scuted them to be descendants of the ancient Aztecs, and related a most improbable story of their having been stolen from the city of Ixamaya, where they were worshipped as gods. A Senor Velasquez, with a Canadian and an American, explored the interior of a portion of Central America, where they formed the acquaintance of the priest under whose guardianship these diminutive deutes lived. This priest was so impressed with the tales told by the travellers of the wonders of the exterior world, that he resolved to carry off the gods of his country. The priest, the Canadian, and the American either perished by the way, or were lost in the forests, and Velasquez alone ways of the carry of remained to tell what story he pleased, without the fear of centradiction. Professor Owen pronounced lear of contradiction. Processor Owen pronounced the two singular specimens of immanity to be merely dwarfs, or monstrosities of Indian parentage; and this opinion becoming general, all interest in the exhibition of the Ixamayan child-gods cused. They returned to London in 1887, were married, and were exhibited found in 1887, were married, and were exhibited

London in 1867, were married, and were exhibited afresh. (See Mexico, Anviquities of.)

Azura, d'-zhave (Fr., light blue), in Paint., a skycoloured blue. The colour made of lapis lazuli, called ultramarine, is held in great estimation by painters.

—In Her., a term used to denote the blue colour in armorial bearings. guished by parallel nes crossing the field or charge

## Babel, Tower of

in an horizontal direction. The old heralds considered it the symbol of truth and constancy.

AZURE-STONE. (See LAPIS LAZULI.)

AZURE-STORE. (See Maris Lazoni.)
AZURETR, distinct, a mineral found in mica-schist, so named from its colour. It is also called lazulite, from its faint resemblance to lapin lazuli, with which it must not be confounded. It consists of phosphate

It must not be conformed. It consists of phosphase of alumins, magnesis, and protoxide of iron.

AZY608, az-c-gos (Gr. a, not, and zagos, a yoke), in Anat., is applied to certain parts of the human body that have no yoke or fellow,—that, in other words, are

B, the second letter in the alphabet of all European and most other languages. It belongs to the order of labials; so called because the lips are the principal organs employed in their pronunciation, and it is the medial letter of the order. It is closely alied to the other labial letters, p and v, with which it readily interchanges. In modern Greece, Spain, and some parts of France, b is pronounced like v; and hence the sareastic remark, that in Gascony vivers (to live) and bibere (to drink) are the same thing. As a numeral, B was used by the Greeks and Hebrews to denote 2; but among the Romans it denoted 300, and with a dash over it, 3,000.

BAAL, bai'-al (Heb., lord, owner), a god of the Chaldeans, Babylonians, and Phoenicians, and, indeed, the principal deity of many of the Oriental nations. Israchics often abandoned the worship of the true God to adore this idol. Incense was the offering most commonly presented; but we read in the Bible that human sacrifices were sometimes made to him. There were a number of idols of a secondary rank bearing the name of Band; such as Band-Berith, "the covenant lord." a divinity of the people of Sechem; Band-Peor, the Pringuts of the Midianties and Moshites; and Bandzebub, the Philistine idol at Kiron.

Bunk halds is a Tookish we 3 change in the Moshites;

Bana, ba'-ba, is a Turkish word, signifying 'father.' In Persia and Turkey it is prefixed, as a title of honour, to the names of distinguished ecclesiastics. It is often also annexed, by way of courtesy, to the names of other persons; as Ali-Baha.

Banning Thrush. (See Thrush.)
Bannin, Towm or, bai-bet (Heb. babel, confusion).
The descendants of Noch, hoping, probably, to make a place of refuge for themselves in case of a second a place of relugo for themselves in case of a second deluge overspreading the earth, are mentioned in Genesia xi. as building this tower of brick, cemented with biturations slime, in the plains of Shinar, in the year 2247 n.c. The Almighty, to punish them for their act of impiety, and their want of faith in his promise that he would not destroy the world again by water, confounded their language, so that the words used by the men of one purty became utterly uninteligible to those of another. A separation of the different groups immediately took place, and in this is found the origin of the various nations that are so widely spread over the cartify surface. Eastern trawidely spread over the earth's surface. Eastern tra-vellers have assigned the position of the Tower of Babel to three different masses of ruined brickwork in the plains of Babylon. Two of these are near the town of hillsh, on the Euphrates, which is supposed to be built on or very near the site of ancient Bahylon, namely, the Birs Nonroud, six miles to the south-west of the town, and the Mujellibe, five miles porth of it, and rather more than half a mile from the Euphrates, on its east bank. The third place which claims to represent it is the tower of Nimroud, near Akkerbuf. majority of those who have made researches in Babylonia are in favour of the Birs Nimroud. The superstructure stands on an immense platform, similar to those usually constructed by the Assyrians for the elevation of their public buildings, which bears traces cleration of their public buildings, which bears traces of the destructive influence of time and long exposure to the elements. It is built of fire-baked bricks, well cemented together, and is oblong in form, measuring about 70° yards round the base. The height on the eastern side is reduced to about 60 feet; but on the west it is about 20° feet high, towering upwards in the form of a cone; and on the top of this is an irregularly-

#### Babiana

shaped mass of brickwork, separated by rents and fissures extending from the summit to its base. Huge bricken fragments, rent from the original building, and bearing the appearance of having heen subjected to the action of flerce heat, lay in confusion on all parts of the mound, which has led Sir R. K. Porter to the conclusion, that the destruction of the tower was effected by means of lightning from heaven. It is supposed that a temple, in honour of Belus or Nimrod, was built on the remains of the Tower of Babel, which has in turn met with total destruction, and added to the

has in turn met with total destruction, and added to the ruins which encumber the platform.

Bablara, hab-ed-nd, in Bot., a gen. of plants belonging to the nat. and Iridaces, and including numerous species, all natives of the Cape of Good Hope. The name is derived from Bablanes, a word employed by the Dutch colonists to distinguish these plants, because their round subterraneous stems are greedily devoured by baboons. The leaves of all the species are narrow, plaited, and sword-shaped; the flowers are very similar to those of the gen. Gladiolus, and are usually yellow,

but sometimes purple, or even scarlet.

Babool, bd-bool, the Indian name for the astringent barks of the Acacia arabica and A. Catechu. (See

ACACIA, CATECRU.)

BABOON, bd-boon' (Fr. babouin) (Cynocephalus), a gen.
of Quadrumana, in which the tail is always short and often radimentary; the nose is prolonged uniformly with the jaws, and the nostrils open at the end of it, exactly as in the dog. Indeed, in shape of head, the resemblance the baboon bears to the dog is its chief distinctive peculiarity. It has a long and truncate muzzle, tive peculiarity. It has a long and truncate muzzle, obeck-pouches, and sharp claws, and is certainly the fiercest and most repulsive of the Quadrumana. The common baboon (Cynocephalus papio) is a native of the coast of Guinea. It is of a uniform yellowish brown colour, with a shade of light red on the head, shoulders, and extremities, the face, ears, and hands being naked, and entirely black. It is furnished with whiskers, which have a beckward direction but do not conveni which have a backward direction, but do not conceu the ears. The variegated baboon, or mandril, is the



BARGON.

most remarkable of the genus. The head of this creature is grotesquely large, its face long; it possesses scarcely any forehead, and its snout is blunt and abrupt. The eyes, which are very small, are sunk deeply in the head, and the cheek bones very prominent, and inted with violet, purple, and scarlet. The hear rises above the forehead to a peak; and beneath the chin there is a small beard of orange-colour. Round the back of the neck the hair is long, and inclines forward. The hinder parts of the animal's body, commencing from the loins, are marked with a soft violet, which gradually expands to the most vivid red; and very singular does its little stumpy tail look, sticking bolt upright in its orimson setting. Many years ago a mandril was kept at Cross's menagerie, in London. "Happy Jerry" the brute was named; and it was taught to simulate a relish for tobacco and beer. This animal ever retained its natural ferocity with was taight to simulate a reism for conscount need. This animal ever retained its natural ferrocity with the city, as it has been handed down to us by the strangers, but was particularly sociable with its Greek historians Herodotts and Diodorus and the keepers. "Happy Jerry's" stuffed skin now adorns the British Museum. Besides the baboons mentioned, been founded by Belus or Nimbod; but Semiranis, 176

# Babylonian Architecture

there are the solada of Abyssinia, the chacms of the Cape of Good Hope, and several others.

BANYLOWIN ANTIQUITIES, bāb-s-lo-se-ān. — The archaeological remains of the ancient and powerful kingdom of Babylon, except those of their architecture (see BANYRONIAN ARCHITECTURE), are but few in number, and of a nature that tends to throw but little light most the history manners and cratters of light upon the history, manners, and customs of a people that once hold predominant eway among the nations of the East, an account of which is chiefly gathered from the historians Josephus and Hero-dotus. The long level plains of the country, interdotus. The long level plains of the country, inter-sected by broad rivers that rapidly overflowed their banks when swollen by rains pouring from the moun-tain districts to the north, rendered it needful that the land should be protected from injury by lines of embankments, and irrigated at pleasure, to insure fertility, by means of canals and smaller artificial water-courses. Traces of these works are to be found in many places; but the most perfect is the canal now called Nahr-cl-Melik, which is supposed to have afforded a means of passage between the Tigris and Euphrates. It fell into neglect and disuse after the occupation of the country by the Saracens, in the 7th century. From the want of stone for building, few monumental records remain to the present day, with the exception of those that lie buried in the ruined masses of mouldering brickwork that represent the stately palaces and temples of the land, some of which stately palaces and temples of the land, some of which have been explored by Layard, Botta, and Rawlinson. Bricks have been discovered bearing names and inscriptions, and carved writings on tablets and circular pillars, in cunciform or wedge-shaped characters, which, when deciphered, afford scanty landmarks of the history of the monarchy during a long series of years. From these inscriptions, Sir Henry Rawlinson has ascertained that the Babylonians belonged to the Semitic group of nations, speaking an Aramaic dialect which much resembled the Syriac. Astronomical observations were taken and preserved at Babylon, some of which are recorded in the "Great Collection" of Ptolemy, and historical annals were written; but there is much that is uncertain and even mythical about Babylonish history, and the inscribed bricks and stones that have yet been found do not go far and stones that have yet been found do not go far to corroborate the long traditional lists of successive imperial dynasties that have been handed down to us. The Babylonians, like the Assyrians, attained a high degree of civilizatios, which brought about their ruin and final absorption into the Persian empire, by inducing habits of pride, effeminacy, and luxury. The government was carried on by viceroys, called satrups. There were three different courts of law for the dwe administration of justice. They carried on an extensive trade by land and sea with the surrounding nations, and Babylon itself was famous for the manufacture of richly-dyed cloths and carpets. They were an idolatrous people, chiefly worshipping They were an idolstrous people, chiefly worshipping the sun, the god Baal, and the goddess Baaltis, whose rites were similar to those performed in honour of Astarte, the goddess of the Phenicians. The Chaldeans formed a separate section of the nation, resemblished the Tairing and the Phenicians.

bling the Levites among the Jews; and to this body belonged the especial care of education and religion, and the advancement of the arts and sciences, which we may reasonably conclude had reached a limit cor-responding with that attained by their neighbours the Assyrians. (See Assyrian Sculpture.)
Barylonian Architecture.—The intimate connection between the countries of Babylonia and As-syria, and their respective capitals Babylon and Nine-

syria, and their respective capitals Babylon and Nineweh, caused a corresponding similarity in their architecture. The same kind of low massive buildings,
raised on artificial platforms that towered one above
another, connected with flights of broad steps richly
ornamented with sculpture, and adorned with magnificent gardens, replate with every flower, fruit, and
shrub that could be gathered from the fertile regions
of the East, characterized both. (See Assuman
Architecture). It will be sufficient here to give a
brief description of the general architectural design of
the city, as it has been handed down to us by the

# Babylonish Captivity

the queen of Ninus, who succeeded her husband on the throne of Assyria, was the real founder of Babylon, adding greatly to the city as it stood in her time, surrounding it with a wall, and building many splendid palaces and temples. Its grandeur was subsequently restored and greatly augmented by Nebuchadnezzar about 600 n.c. According to Herodotus, the city was square in form, with the river Ruphrates running through the centre of it. The circumference of the outr walls was 60 miles, which would make each side of fac city to be about 8 miles in length. The streets of me only to be monto makes in length. And streets in the centre were broad and straight, cutting each other at right angles, like those of many American towns in the present day. A bridge over the Euphrates conacted the two portions of the city on either side connected the two portions of the city on either side of the river. The surrounding walls were said to have been 360 feet in height and 75 feet broad, with 100 gates of brass at equal intervals. This statement must, however, be regarded with suspicion, particularly with regard to the great height assigned to the walls. The chief architectural points of interest in ancient Babelon surf, have the section of the points of the section and the section of the section and the section of the section of the section and the section of Babylon must have been the great temple of Belus, builton the ruins of the Tower of Babel (see Babel, Towns or), now called the Birs Nimroud; the Mujelibe, which has been conjectured by some to be the imperial citadel of the monarchs of Babylon; and the renowned Hanging Gardens, said by some to have been constructed by Semiramis, and, by others, to have been raised by Nebuchaduezzar for his queen Amytis. They were five in number, containing an area of about 20 acres between them. They were in terraces one 20 acres between them. They were in terraces one above another, sustained on arches and columns until they equalled the height of the walls of the city. Broad flat stones were laid on the tops of the arches, and these were in their turn covered with layers of bitumen and plates of lead, on which a considerable depth of earth was placed. The site of these gardens is supposed to be a mound on the east side of the river, called by the Arabs El Kasr. The bricks used in the various structures that adorned the city were better than those prepared at Ninevell, being hardened by fire in kilns, instead of being merely dried in the sun, and, in con-sequence, more durable, and better adapted to preserve names and inscriptions imparted to them while in a

BABYLONISH CAPTIVITY, a term applied to the compulsory residence of the principal families of the kingdom of Judah in Bubylon, under Nebuchadnezzar and his successors. In the reign of Zedekiah, king of Judah, about 600 n.c., Nebuchadnezzar first invaded the Jewish territories, and laid siege to Jerusalem. Retiring into his own country, he renewed the attempt to subjugate the Jews, 587 B.C., and succeeded in taking to unjugate the Jews, by: B.C., and succeeded in taking the city, and destroying the fortifications and the temple built by Solomon. Zedekiah had his eyes put out, and, with the chief of his people, was carried captive to Babylon. After the overthrow of the Babylonian empire by Cyrus the Persian, 536 B.C., the Jews were permitted to return to their native land, and the Babylonish captivity, which is reckoned to have lasted from the first invasion under Nelspeladarrae lasted from the first invasion under Nehuchadnezzar, was thus brought to an end. The Jews were not in a state of intolerable servitude during this period, but many of them rose to offices of high standing and honour in the court of Babylon, as may be learnt from the histories of Daniel, Esther, Mordecai, and

BABYROUSSA, bab - i - roos' - sa (Sus Babirussa) animal of the hog gen., found in a wild state in India and the Indian islands. The animal's chief peculiarity and the Indian islands. The animal's chief peculiarity is the possession of two protruding and curved tusks, turned upwards and backwards, so as very marily to describe a somicircle. The object of this peculiar arrungement is not known, though some of the older naturalists gravely tell us that the use of the tusks is to afford the babyroussa an opportunity itself to any convenient projection, should it faucy a quiet map. The same authorities, however, ascribe to animal quiet nap. The same authorities, however the horns of the chamois the same use. is still further distinguished from the common hog by its slender build and the fineness of the bristles that cover its body. It is said that, when closely pursued, the babyroussa will, without hesitation, take to the water, and, by alternately swimming and diving, speedily clude its enemy. Its food is vegetable, and

# Backgammon

its flesh, according to travellers, superior to dairyraised pork.

Bacca, or Berry, bak-ka, in Bot., a meny-seeded pulpy fruit, inferior (adherent to the calyx) and inde-asseem (not opening to allow the seeds to occupe). Assert (not opening to allow the seeds to escape). Examples may be found in the gooselerry and currant. The fruit of the grape is called a meadanium; but it only differs from the bacca in being superior (free from the calyx). The name bacca is applied by some botanists to any fruit of a pulpy nature.

BACCHAMAIA, bit-Manaid in a...—Festivals held at Rome in honour of Bacchus. The institution of these facets which were similar to the Direction?

feasts, which were similar to the Dionysia of the Greeks, was first introduced from Greece to Etruria, treers, was are introduced from trees to acturing and thence into Rome. They were held four times annually, and were originally only celebrated by women. The great amount of immorality and debauchery that soon characterized their proceedings called forth the intervention of the senate in the year. 566 A.U.C.; it was then discovered that more 7,000 persons had been initiated, and had bound them 7,000 persons and been initiated, and and sound themselves by oaths of secrecy. The Senate at once decreed that the saturnalia should be abolished throughout Italy, and the festivals were accordingly entirely suppressed in the year B.c. 186. (See Dionysta.)
Bachelon, bätch'-e-lor (Fr. bachelier, Lat. baccalau-

real), is one of those words of doubtful etymology which have given rise to many absurd conjectures. Among the various meanings of this word, it denoted, -1. those who cultivated certain lands, called baccalaria; 2. coelesiastics of a lower grade than the other nembers of a monastery; 3, persons of a military order inferior to knights, who, from want of age, poverty, or other cause, had not yet raised their banner in the field; 4. any young unmarried person; 5. an academical degree. As an academical title, it was first academical degree. As an academical title, it was first introduced in the theological faculty of the University of Paris in the 13th century, being applied to a candi-date who, having passed his examination, was entitled to lecture, without being of the rank of an independent docent or master. Afterwards the word was used in the other faculties as the lowest kind of academical honour. In many countries laws have been enacted against bachelors or unmarried persons. In Greece, by the laws of Lycurgus, and also by those of Solon, celibacy was regarded as a crime; and in Rome un-married persons were placed under certain disabilities. In this country taxes have been imposed upon bachelors and widowers, and married persons with children in some measure relieved; but more apparently with the view of raising money than from any other object. In 1695 an act was passed, entituled. "An Act for granting to his Majesty certain rates and duties upon marriages, births, and burials, and upon bachelors and marriages, for the term of five years, for carrying on the war against France with vigour." Bachelors above the age of 25, and widowers without children, paid is. yearly and upwards, according to their rank. In the tax on servants, first imposed by Mr. Pitt in 1785, and continued to the present time, a higher rate is charged for the servants of bachelors; and, in the income-tax of 1798 certain deductions were allowed to those who had children.

BACILLABIA, bd. sil-lair'-i-i (Lat. bacillum, littlestick), a gen. of Diatomacea (which see), consisting of silicious frustules of a prismatic form united into a brilliant chain, often in a sigzag manner. They form beautiful

microscopic objects.

Back, bak (Ang.-Sax.), is that portion of the human back, and (Ang. Car.), is that portion of the inflate body which extends from the neck to the loins, and includes the dorsal vertebres, the posterior portions of the ribs, and the muscles and skin pertaining thereto. Pains in the back may proceed from a variety of causes; as rheumatism, an affection of the spine, disease of the kidneys, &c.

Back AND Fill, in Mar., an operation generally restormed in narrow science by keeping the shin in the

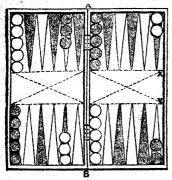
performed in narrow rivers, by keeping the ship in the middle of the stream, by advancing shead from one shore and moving backwards from the opposite shore.

Backgammon, būk-gām'-mon (Sax. bac, back, thid

game, a game), a game of chance, played by two players, with fifteen black and the same number of white pieces or men, on tables divided into twenty-four points. The movement of the pieces from point to point sergulated

## Backing Warrants

by casting dies alternately from little boxes, with one by casting dice alternately from little boxes, with one of which each player is provided. The arrangement of the board and places will be more readily understood by reference to the accompanying diagram, in which the men are set in readines to commence the game; the player using the black men being seated at the upper end of the coard, at A, and the one using the white pieces at B. It is the object of the player at A to get all his men into the section of the tables on is left hand, or "home," as it is technically called, and "bear" or remove them from the board in accordance with the numbers indicated by the succession and "bear" or remove them from the board in accordance with the numbers indicated by the successive casting of the dice, before his adversary can do the same, after getting his pieces into the section on his right. The dice are cubes, spotted on the sides from one to six; and, as they are thrown together, any



BACKGAMMON-BOARD.

combination of two numbers can be thrown, from two aces to two sixes. The terms for the numbers on the aces to two sixes. The terms for the numbers on the dioc are as follows:—1, ace; 2, deuce; 3, trè or tray; 4, quatre; 5, cinque; 6, size. If doublets are thrown, or similar numbers on each die, double the number of points are reckoned. Thus, if two cinques be thrown, twenty points are counted. The points on the hoard are counted from one to six in each of the four sections respectively, each player commencing from the point in the table opposite to him, on which two men are seen to be placed in the right of the diagram. Thus the player using the white men counts from the point marked X, and his adversary using the black pieces from the point marked Y. Two men can be advanced at once, one for each number turned up on the dice; or one man may be moved forward as many points as the numbers on the dice amount to taken together. When any point is covered by two of an opponent's men, the player cannot put any of his upon that point; but if one only be there, which constitutes what is called a blot, that man may be removed and placed on the centre dice are as follows:—1, ace; 2, dence; 3, trè or tray; 4. quatre: 3. sinque; 6, size. If doublets are thrown, that man may be removed and placed on the centre must be entered on any vacant point in the "home" section of the tables belonging to the opponent of the player whose man has been taken up, provided the number turned up on either die correspondents. point, and must then be brought round from the com-neancement like the men on the acc-points in either table. Towin a hit is to remove all your men from the table before your adversary has removed his: this counts one. To win a gammon, which counts two, is counts one. To win a gammon, which counts two, is to remove all your men before your adversary has brought all of his home; and if your men are entirely removed while your antagonist has one remaining in your home section of the tables, you win a backgam-mon, which counts three. The Welsh claim to have invented the name, deriving its title from the Welsh

# Baconian Philosophy

county from that mentioned in the body thereof, expowering the officer to execute the same in such other

County.

Backstaff, bdb'-steff, in Mar., an instrument used before the invention of the quadrant and sextant, for taking the sun's attitude at sea, and so called from the back of the observer being turned to the sun willed making the observation. It was invented by Captin John Davis, a Welch mariner, about the year 1500.

Back-staff, bdk-staff, in Mar., long ropes, extending from the top mastheads to the starboard and larboard sides of the ship, their use being to secondthe efforts of the shrouds in supporting the masts. They

larboard sides of the ship, their use being to secondate efforts of the shroulds in supporting the masts. They are usually distinguished into breast-back stays and after-back stays, the intent of the first being to sustain the mast when the ship sails upon a wind; the second to enable her to carry sail when the wind is further aft. Back-the-Cars, in Mar., to manage the oars in a direction contrary to the usual method, so that the boat shall move with her stern forward.

boat shall move with her stern forward.

Bacon, bail-kon (Sar. bacan, to bake, or Ger. bache, a wild sow), salted and dried pork, made from the sided and belly of a pig. The process of curing is effected by impregnating the flesh with salt, and allowing it to by impregnants the new with that, and another remain in the brine for some time. It is then taken out, dried, and smoked. Bacon-hams are the cured hind-legs. The working classes of England are more particular about the quality of the bacon they consume, and give a higher price for it, than the working classes of any other nation. York, Hants, Berks, and Wilts, are the counties most celebrated for bacon and hams in England; and Dumfries, Wigtown, and Kirk-cudbright, in Scotland. Bacon is largely imported into this country from the United States and the Hanse towns.

Baconian Philosophy, ba-ko'-ni-an, is that bys-

Francis Bacon, and which consists much more of a Method than of developed scientific results. If the experimental method which he introduced to the notice of the world was neither absolutely new, nor very directly useful, yet it possessed some really novel elements, and had the effect on his immediate suc-cessors of overthrowing the old methods of research, and thus of heralding a new ers of scientific discovery. The mind of this man (we speak not here of his moral character), as Lord Macaulay has felicitously physical it, was like the tent the fairy Peribanou gave to Prince Ahmed,—"fold it, and it seemed a toy for the hand of a lady; spread it, and the armies of powerful sultans might repose beneath its shade." If Bacon's Method has not proved quite so useful down to the present time as men might desire, they forget that the author of it had during his day no science exactly developed in the inductive method to act as a model to guide him in laying down his directions for future discovery. No doubt his conception of a scientific Method was magni-Scent; and the general rules, aphorisms, and wise reflections which dropped from his capacious brain, reflections which dropped from his capacious orani, have served as sign-posts to all subsequent explorers, which they have never ceased to quote with devout admiration. The importance of what Bacon did is not to be measured by his scientific discoveries, for he made almost none, but wholly and solely by the clearness and even novelty of his scientific method. The experimental method has been accused, both by Count Joseph de Maistre, therenowned author of the Soirées de St. Pétershourg, and by Lord Macaulay, in his celebrated Essay on Bacon in the Edinburgh Review, of being old, of being useless, and of being affoat in the being out, of being useress, and of being anoar in the scientific spirit of the age in which the philosophy appeared. Now there is a shade of truth, but nothing more, in the whole of these objections. To take up the first. No doubt the illustrious Albertus Magnus had previously insisted on some portions of the experimental method, and Bacon's great predecessor and namesake had done so, much more; but no man had, previous to his time, taken into account the radical difference which subsists between "simple enumeration," which belongs to every mind in the world, and the circumspect scientific method which alone renders merence when subsists between "simple enumeramode fack, little, and gammon, a battle. The etymords back, little, and gammon, a battle. The etylittle, which belongs to every mind in the world, and
had been enumeration," which belongs to every mind in the world, and
had back, little, and gammon, a battle. The etylittle, little, little,

on induction; but the only system contemplated by them was that which Francis Bacon denominates "inthem was that which Francis facon denominates "induction by simple enumeration," which consists in
setting down as general truths all propositions which
welhave found to be true in every instance. This is
the natural and instinctive action of every mind, as
we may easily ascertain for ourselves, by watching the
fall of the first person we meet. Now Lord Bacon's
method was altogether different from this. It consisted of a much wider and more circumspect way of verifying or a muon winer and more circumspect way of verifying scientific facts than had been disclosed to the world before. His method consisted of "interrogating" nature by observation and experiment; whereas the ordinary way in which induction was gone about previous to his time consisted in the "anticipation," previous to his time consisted in the anticipation, and, of course, in countless instances, the miscenception of nature. Man he proclaimed to be the "minister and interpreter of nature." in the first aphorism to his Movem Organium, which contains nearly all of his direct contributions to the science of method. He says, direct contributions to the science of method. He says, again (in Aph. 14), "A ryllogism consists of propositions, propositions of words, and words are the signs of notions; therefore, if our notions, the basis of all, are confused, and over-hastily taken from things, nothing that is built upon them can be firm: whence our only hope rests upon genuine induction." And this genuine induction he explains further on (Aph. 19): he says, "It constructs its axions from the senses and particular the constructs of the sense of t 15 constructs 16 axioms from the senses and particulars, by secending continually and gradually, till it finally arrives at the most general axioms, which is the true but unattempted vay. The uselessness of this method has been answered already; and the third objection, as quite valid, though a little captions, needs no rouly. Such than an the general descriptions. no reply. Such, then, are the general characteristics of the Baconian method of induction. A few words as to the details of this method. Before entering on the rules which he lays down for the guidance of future discoverers, he occupies a good number of aphorisms cuscoverers, no occupies a good number of aphorisms in enumerating the enuses of error. These idols (idols, Gr. eidola, which Hallam takes to mean a fulse appearance or divinity, while Playfair and the rest of them adhers to the ordinary meaning of the word idol be divides into four classes,—idols of the tribe, of the den, of the fewer and of the theory and the theory are the theory and the theory and the theory are the theory are the theory and the theory are the theor of the forum, and of the theatre. 1. The idols of the tribe are the causes of error founded on human nature rive are the causes of crist counced on numan nature in general. Among the idels of this class is the propensity which there is, in all mon to find a greater degree of order, simplicity, and regularity in things than an accurate observation will warrunt. To take an example:—As soon as men perceived that the orbits of the planets returned into themselves, they immediately jumped to the conclusion that they moved in perfect circles, and not in ellipses, as Kepler was the first to demonstrate. 2. The idols of the den are those which rise up from the peculiar character of the individual obup from the peculiar engracer of the nurvious operers, whether natural to him or acquired. Some minds are adapted to note the differences of things; others to eatch their resemblance. While one man carefully dissects everything to the minutest detail, another man, of a more active temperament, bounds off on the wings of a resemblance. They both err by excess; the cape by being too detailed the other by not being one by being too detailed, the other by not being detailed enough. 3. The idols of the forum are those which arise out of the forms of language and from the intercourse of society. Men believe that their thoughts always govern their words; but it often happens to be all the other way. This is provoking; for, words being to a large extent the formation of the rude multitude, we find, when we examine them, little of that delicacy and precision requisite for the processes of science.

4. The idols of the theatre are the deceptions which have arisen from the dogmas of different philosophical schools. This last class differs from the other three, inasmuch as it does not arise naturally and spontane ously in the mind, but must be acquired often at the expense of great labour and study. Having now completed these preliminary and very necessary cautions, he proceeds to describe and exemplify the nature of his poproceeds to describe and exemplify the nature of his peculiar method. Our first object, he says, must be to prepare a history of the phenomena to be explained, in all their modifications and carieties. This history is not to be without experiments instituted for the cake of discovery. Such a record of the phenomena of any occurrence he denominates its Natural History. This being ascertained, we must next entire to discover the cause or

form of these phenomena. The form of any quality in a body is convertible with the existence of that quality. Thus, if transparency be the quality which we are inquiring after, of course the form of this quality will exist wherever transparency is to be found. Cause differs somewhat from form in this way; that, while cause is only applied when we wish to speak of the cause having taken place form is explicit as while cause is only applied when we wish to speak of some change having taken piace, form is applied to any permanent quality. Two other subjects which Bacon discusses with considerable minuteness, are those of what he calls the tatent process and the latent schematism. We have an example of the former in the firing of a cannon. The short time that elapses be-tween the application of the match and the expulsion of the ball quantitates a latent process of a project tween the application of the match soft the expulsion of the ball, constitutes a latent process of a curious and complicated character. The latter, or the latent schematism, is the invisible structure of Bodies, on which so many of their properties depend. Thus, the internal structure of plants, or that of crystals, is the internal structure of plants, or that of crystals, is the internal structure of plants, or that of crystals, is the internal structure of plants, or that of crystals, is the internal structure of plants, or that of crystals, is the internal structure of plants, or that he calls "negative instances," or those cases in which the form inquired after does not appear. To take our former quality, that of transparency, he would tabulate such occurrences as the following in this inquiry. Pounded glass is not transparent, while glass unpounded is; collections of vapours are not transparent, while a single vapour is; and so on. After a great many exclusions vapour is; and so on. After a great many exclusions have been made, one of the remaining principles may be assumed as the cause in trying to investigate the origin of any process or phenomenon in nature. We are to reason from this assumed principle, and try if are to reason from this assumed principle, and try if it will account for the phenomenon. So important did this precess of exclusion appear to the mind of Bacon, that we find him saying, "It may, perhaps, be competent to angels or superior intelligences to determine the form or casence directly, by affirmations from the first consideration of the subject; but it is certainly first consideration of the subject; but it is certainly beyond the power of man, to whom it is only given to proceed at first by negatives, and in the last to end in affirmatives." Men can now preduct whereas, before, they could only vaguely guess. Such is a brief sketch of this wonderful experimental philosophy, which has transformed the world so far since Bacon's day. The benefits which it has effected for mankind, Lord Macsulay sum up as follows: "It has lengthened life; it has mitigated pain; it has extinguished diseases; it has increased the fortility of the soil; it has given new securities to the fertility of the soil; it has given new securities to the mariner; it has furnished new arms to the warrior; it has spanned great rivers and estusties with bridges of form unknown to our fathers; it has guided the thunderbolt innocuously from heaven to earth; it has lighted up the night with the splendour of the day; it has extended the range of the human vision; it has multiplied the power of the human muscles; it has accelerated motion; it has annihilated distance; it has facilitated intercourse, correspondence, all friendly offices, all dispatch of business; it has enabled man to descend into the depths of the sea, to soar into the descend into the dopths of the sea, to soar into the air, to penetrate securely into the noxious recesses of the earth, to traverse the land in cars which whirl along without horses, and the ocean in ships which sail against the wind. These are but a part of its fruits, and of its first-fruits. For it is a philosophy which never rests, which has never attained, which is never perfect. Its law is progress. A point which is never day was invisible is its goal to-day, and will be its starting-post to-morrow."

Bacterian Cone, bak-frian.—It must be first stated that Bacteria is the ancient name of a province now

BACTEIAN COINS, bak\*-fri-an.—It must be first stated that Bactria is the ancient name of a province now called Ballh, which is situated directly north of Afghanistan, and separated from it by the western part of the Hindoo-Koosh Mountains. It was a powerful country in the early ages of the world; but nothing certain is known of its history. When Alexander the freat overran Asia with his Macedonian and Greek troops, he established a Greek colony there, and fortified a city for its protection. Bactria was tributary to Dersia for fifty years after the death of Alexander; but was afterwards annexed to the great Syrian empire formed by Scleucus Nicator, about 312 2.C. The Greek clement infused into the province of Bactria by Alexander soon became predominant; and in the reign of Antiochus II., surnamed Thoos, which lasted from of Antiochus II., surnamed Theos, which lasted from 261 to 246 B.C., Theodotus, the Greek governor of the

country, threw off the yoke of the Seleucide, and established the new Greek kingdom of Bactris, seemd-ing the throne under the title of Theodotus I. The ing the throne under the tate of Theodotta I. The records of this comparatively new kingdom are as scanty as those of the ancient one. It was merely known to have existed for about 160 years, and then to have been overthrown by the Scythians, who took possession of the country. The discovery of some Bactrian coins, bearing dates of this period, in burial-bace in various parts of Afabraites 164 to a further places in various parts of Afghanistan, led to a further search, which resulted in the collection of many thousearch, whose resulted in the confection of many thousand pieces of money, from which lists of the Greek rulers of Bactris have been compiled by Messrs. Wilson and Prinsep. "The following is a list of the first six kings, who seem to have held the country under undivided control until 150 n.c.:—

	B.C.		
1.	258	Theodotus I.	
2.	240	Theodotus II.	
3.	220	Euthydemus.	

4. 190 Demetrius.

181—178 Eukratides
 155—147 Heliocles

From this time until the final subjugation of the country by the Scythians, the different Bactrian coins, bearing names of different persons exercising sovereign power at the same date, or within intervals of two or three years of each other, seem to indicate that the territory was either split up into independent districts, or that internal anarchy and dissension prevailed, and that the ambition of the leading men in the state led to a continual struggle for the sovereignty. The coins to a continual struggle for the sovereignty. The coins are divided by numismatists into two classes,—pure Greek, bearing legends in Greek letters only, including the coins of the first five kings given in the above list; and bilingual, or coins with inscriptions in Greek and and bungual, or come with inscriptions in Greek and Prakrit, a dislect of the Sanscrit language. Many of the bilingual coins are square in form; and the introduction of the elephant and elephant's head, and many regal emblems peculiar to India, show the evident decline of the Greek power, and the introduction of foreign influence into state affairs. There are only two gold coins of the Greek kings of Bactria known to have introduction of the Greek kings of Bactria known to

two gold coins of the Greek kings of Bactria known to be in existence,—one of Theodotus I., in the Imperial Cabinet of Paris; the other of Euthydemus. All the other pieces of money that have been found are in silver and copper, or billon, a mixture of these two metals.—Ref. English Cyclopadia—Arts and Sciences.

BACTRIS, bäk-tris, in Bot., a gen. of Palms, consisting of numerous species, all natives of tropical America. They are mostly small trees, with slender reed-like stems. The fruits, which are small, soft, and sub-acid, are greedily devoured by small birds. Tough fibres, used for making nets, are obtained from the stems of some of the species.

some of the species.

Baculium, a staff), in Geol., straight, many-chambered, conical shell, of the Chalk spoch. In its internal structure it resembles the ammonite. From its prevalence in the chalk of Normandy, that rock has been termed the baculite limestone.

BACULOMETRY, bak'-u-lom'-e-tre (Lat. baculus, astaff; Gr. metron, a measure), the act of measuring distance or altitude by a staff or staves.

BADGE, bidj, in Her., a mark of distinction or cognizance, assumed or conferred by royal authority. To the latter class belong the various emblems of the orders of the United Kingdom of Great Britain and Ireland, and other European countries, conferred by their respective reigning monarchs, and all marks of honourable distinction, such as medals, rib-bons, and crosses, given by the crown for military provess, or services rendered by any one to the state in a civil capacity. Under the former class may be reckoned the different crosts and distinctive bearings reaconed the americal crests and distinctive bearings assumed by nations, tribes, and families, in early and mediaval history, which can now be rightfully borne by a grant from the Herald's College only. The earliest mention of heraldic badges is to be found in the Bible, in which each of the twelve tribes of the children of Israel are spoken of under their respective cognizances: Israel are spoken of under their respective cognizances; such as the lion of Judab, the wolf of Benjamin, and the serpent of Dan. The eagle was the badge of the empire of Rome, and subsequent imperial dynastics have frequently adopted the royal bird as their distinctive emblem. The white horse, now borne in the royal arms of Hanover, was the badge of the Saxons; the

raven that of the Northmen and Danes. The white rose was the badge of the house of York; the red rose, that of the rival house of Lancaster: the Tador family combined the white and red rose, as emblematic of the upion of the antagonistic houses. A white hart with a collar round its neck, and a chain, was the badge of Richard II.; a boar, that of Richard III.; a crown in a thorn-bush, that of Henry VII.; the bear and ragged staff, that of the Nevilles, or house of Warragged stan, that of the Nevilles, or house of War-wick; the garb, or wheatsheaf, and sickle, that of the Hungerfords. The badges of the different orders of knighthood will be found under their respective head-ings. (See Bath, Onder of the; Garren, Onder Of the; Starop India, Order of the.) The badges of the United Kingdom of Great Britain and Ireland or the United Aingdom of Great Airdina and reasons are as follows:—England, a red and white rose, with the royal crown: Scotland, a thistle and crown: Wales, on a mount vert, a dragon passant, with uplifted wings, guies. The badge of the prince of Wales is three ostrich-feathers, with the motto "let dien." The serving-men and retainers of a lower class belonging to noble houses, and the coverage attached to continue. to noble houses, and the servants attached to gentlemen's families, usually wore their muster's crest or badge embroidered on the left arm of the blue cost. that was commonly worn in former days instead of the parti-coloured liveries of modern times.

BADGER, badj'-er (Meles Tuxus), a carnivorous quad-BADGER, budy or (Meter Turus), a carnivorus quadruped inhabiting most parts of Europe and Asia. The badger was classed by Linnæus among the bears, but very properly separated from that group by succeding naturalists. It is a slow and heavy animal, passing the day in sleep within its complicated burrow, and emerging at night in search of food, which consists indifferently of animal or vegetable matter. It is said sometimes to dig up wasps' nests; and Buffon, who mentions this habit, attributes it to the animal's fond-



BADGER.

ness for hovey; but as wasps do not collect honey, the great Frence naturalist is in error. The badger mea-sures shout two and a half feet in longth; its legs are very short, and its body flat; its eyes are very small; its neck short and thick; its tail stumpy; and its hide loose and tough. It was this last quality that in an-cient times recommended the badger to folks of brutal mind as a fit subject to pit against mastiffs. Badger-buiting used to be a very favourite sport in Eugland; and despiteits many disadvantages, the badger's strong jaws and loose skin made it a formidable antagonist jaws and loose skin made it a formidable antagonius for a dog. No matter what part of the hadger's body was seized, it could turn and fix its teeth in its assailant, and inflict on it a terrible bite. The fich of the badger is eaten in Italy, France, and China, and may be converted into hams and bacon. The skin, when dressed with the hair on, is impervious to rain, and is, therefore, considerably used in covering travelling-boxes. Its bristles are made into painters' brushes. hoxes. Its bristles are made into painters ornsness. To this family also belong the Ratels, or Honey-badgers. To this family also belong the Ratels, or Honey-badgers (Mellivera). The best-known species is the Cape Ratel (Mellivera capensis), which closely resembles the badger both in size and form, but is, perhaps, heavier in its appearance, and has the nose less developed. Its colours are grey above and black beneath. It burrows like the badger, not only to provide itself with a habitation, but also in search of the nest of the with a natitation, but also in search of the uses of lines wild bees, of whose honey it is passionately fond. It has the same loose hard skin as the European badger, and in this leathery armoured it is said to attack the citadels of these irritable insects with impunity.

Bagassa, ba-gas, a term applied to the refuse of

#### Baggage

the sugarcane, left after the expression of the saccha-rine juice. It is used as fuel in heating the boilers and

rine juice. It is used as not in heating the boilers and pans in the sugar-manufactory.

BAGGAGE, big-gay (Fr. bagage), in Mil., is a term applied to the clothes, tents, provisions, and other necessaries of an army. By the ancient Romans the haggage of an army was termed impediments, impediments or kindrances. The appeient soldier on the march was always heavily laden; and, in this respect, the ancient and modern avatems uresent a striking conmarch was aways nearly intent; and, in this respect, the ancient and modern systems present a striking con-trast to each other. The modern soldier is freed from every unnecessary enumbrance, and waggons are attached to each battalion for conveying the baggage. In our army, no private soldier is allowed to carry anything except what his knapsack and other accou-trements can hold, with the exception of shose that trements can and, what the exception of shose that are margined with consent, who are allowed one small chest each, of a fixed size, which must be carried at their own expense on a march. Staff and pay-sergeants are also allowed one small chest each.—Ref. Walshe's Military Cutechism and Handbook.

Reserve Landing (12s) keeps in a bath or bething

Waishe's Mittery Cutechism and Handbook.

Bachto, bust'yo [1sal. bagno), is a bath or bathinghouse. It is applied to the prisons in Constantinople,
where the slaves or convicts who are employed on the
public works are confined at night. The term bagnes,
applied to the convict prisons of France, is derived
from the same root. By older English writers bagno
is used for a house of bad fame.

Receive hat come a wind instrument of high

BAGFIFE, bigg-pipe, a wind instrument of high antiquity, in use with the Hebrows and Greeks, and a favourite piece of musical apparatus with the people of Europe during the Middle Ages. In Scot-land, where it is said to have been introduced by the



ITALIAN BAGPIPE.

the people. Under various forms, it is still played by the natives of Ireland, the south of France, Italy, Po-land, &c. The Scottish bagpipe consists of three parts; first, a leathern bag, which is inflated by means of a tube fitted into it, and stopped by a valve; secondly, four pipes, three called drones, and one the chanter, which latter has fingerholes, and upon which the melody is played. This latter alone emits the wind at the bottom and at the finger-holes. The three first-men-tioned pipes, all of which are tuned into a chord, are fastened

together in a fan-shape by cords or ribbons, and are so inserted into a socket as, when inflated, to lie up against the left shoulder and arm: from these pipes the wind passes out at the top. The third portion of the instrument consists of n sort of wooden nave or scoket, into which the (fixed) ends of the pipes are inserted, and to which the lower end of the bag is firmly attached by wrapping. There is a great dif-ference between the Scottish and the Irish bagpipe. The former is supplied with wind from the lungs of the The former is supplied with wind from the lungs of the playor; the latter from a small bellows fastened with straps underneath, and worked by, one arm, a tube passing from it in front of the breast to the bag, which is under the other arm. All the pipes in an Irish bagpipe point (alantingly) downwards, one of these having one or more keys upon it, worked by the wrist of the performer, so that the chord may be varied. The tone of the Irish bagpipe is low and sweet. In the Highland regiments of the British service, the bagpipe is played by pipers attired in their national costume. There are, also, certain Highland societies for promoting the skilful staying of the instrument. The namesed illustration will serve to show the form of the bagpipe played by reasants from the sense of the potential serve to show the form of the bagpipe played by reasants from the mountains before 181

#### Bailiwick

Within the last few years the instrument has likewise made its appearance in London, where it is played upon by certain picturesquely but dirtily-elad Italian rustics, called piffereri.

Baus, bdgs (Norm. bogs, a bag), in Mil. Mied with sand or earth, are used in field-fortification or other defensive works. Sandbags, which are generally sixteen inches in diameter and thirty high, and filled with sand or earth, are used to repair breaches in the embrasures of butteries when damaged by the enemy's fire or the blast of the guns. They are also placed on parapets, so arranged as to form a covering for men to fire through. Earth-bags contain about a cubic foot of earth, and are used in raising a parapet in haste, where the ground is rocky, or does not afford ready materials for that purpose.

raising a parapet in haste, where the ground is rocky, or does not afford ready materials for that purpose. BAOSHOT SANDS, big/ shot, in Gool... a series of lower tertiary beds, consisting chiefly of light yellow cands reposing on the London clay, and occupying extensive tracts around Bagshot, in Surrey, and in the New Forest, Hampshire. They correspond to the Brocklesham beds (which see).

BAIL, bail (Fr. bailler, to deliver), signifies the delivery of a man out of custody, upon the undertaking of one or more persons for him that he shall appear at day limited to answer and he instifled by the law

a day limited, to snewer and be justified by the law. In civil cases the bail may render their principal at any time; in criminal cases they cannot, unless he diy, or they have reasonable doubt that he will do so. In such case the defendant may be detained and In such case the defendant may be detained and brought before a justice, who may commit him in discharge of his bail, or put him to find now sureties. In civil cases, the bailing is by bond to the sheriff, or by consent given to a judge or commissioner; in criminal matters it is effected by entering into a verbal recognizance. In the former the bail are liable for the

recognizance. In the former the bail are liable for theamount of the debt, or damages and costs recovered;
in the latter, to the amount of their recognizance.

Batter, baile (Lat. ballium, probably a corruption of vallum, a rampart), originally meant an outer
bulwark, butcame afterwards to be applied to the area
or courtyard within one. It denoted the space inclosed within the walls of a castle. Where there were
double walls, the area between the two was called the
outer, the area within the inner wall, the inner bailey.

Batter, bailif (Lat. ballium; Fr. bailli), according
to Sir Edward Coke, is an old Saxon word, which signifles a keeper or protector; and although there are
several officers called bailifs, whose offices or employments seem quite different from each other, yet some-

several onicers cause boulps, whose onices of employ-ments seen quite different from each other, yet some-thing of keeping or protection belongs to them all. Hence the sherif is considered as builty to the crown, and his county, of which he has the care, and in which he is to execute the queen's writs, is called his bailwick, and the officers who, by his procepts, execute writs and other process, are called his builty. There are, likeand other process, are called his builty. There are, likewise, bailty of liberties, who are officers under lords who have franchises exempt from the jurisdiction of the sheriff. There are, likewise, bailty of lords of manors, who collect their rents, levy their fixes, attend their courts, and execute their warrants of seizure of eacheated property and heriots. There are also bailties of forests, and those to whom the queen's castles are committed; as, the bailtiff or constable of Dover castle. The chief magistrates in divers ancient corporations are also called bailty; as in Ipswich, Yarmouth, Colchester, and other places. In common parlance, is alliff is a person who has the management of an estate or farm, and superintends the same for the owner; and persons who are employed to distrain for rent are called bailty.

#### Railment

BAILMENT, bail ment (Pr. bailler, to deliver, or put into the hands of), in Law, is a delivery of goods in trust upon a contract, expressed or implied, that the trust shall be faithfully executed on the part of the bailee; as, if cloth he delivered, or (in legal dislect) bailed to a tailor to make a suit of clothes, he has it bouled to a tailor to make a suit of control, he man mupon an implied contract to reader it again when made, and that in a workmanlike manner; and, so, in the case of goods delivered to a carrier, or at some place appointed by him, for transit to a third party; and either generally or in a particular manner, an implied contract is raised that the goods shall be delivered accordingly. The varieties of bailner, an implied consultant and the varieties of bau-ahall be delivered accordingly. The varieties of bau-ments are so mamerous that it is scarcely necessary to define them. As to the liabilities of bailees, it may be taken as a general rule that where the bailment is for the mutual benefit of bailor and bailee, the latter is liable for negligence; viz., for the omission of that degree of care which a man of common prudence takes of his own concerns; secondly, that upon a bailment from which the balles derives no benefit, nothing short of gross negligence will make him responsible; thirdly, that upon a bailment for his own exclusive benefit, he will, on the other hand, be chargeable even for slight negligence; and lastly, that he is liable in none of these cases for a robbery or other casualty in no degree attributable to his own fault. A ballee has a qualified property in the goods transferred to him, against any stranger or third person. A ballee may have a general



BAINBERGS.

or particular lien on the goods intrusted to him. This subject will be treated under the word LIEN. BAINBERGS, bain'-bergs (Germ

bein, leg, bergen, to conceal), a term employed to distinguish the greaves worn over chain-mail armour as an additional protecarmour as an additional protec-tion to the leg. They seem to have been first adopted in the 13th century, as they do not appear in monumental effigies before that time. Their adoption led ultimately to the use of entire plate-armour. The illustration shows the mixture of plate-armour and chain-armour, and represents part of the capa-rison of a knight of the reign of Edward III.

un outer vessel

containing water, or some other fluid, in a state of coulli-tion: within this

BAIN-MARIE, bain(g)'-mare', a bath much used in oulinary operations in France, and so called from the name of the inventor.' It is also largely employed in chemistry, and mostly consits of



BAIN-MARIB.

is another vessubstance to be operated upon is placed. The object of the bain-marie is, to produce a gentle and regular heat, and it is principally used for evaporating or for distilling volatile and aromatic substances. When sand is substituted for brilling water, this apparatus is called a sand-bath, and when boiling water is employed, it is called a vapour-

bath. BATALM, bair'am, is the name of a Mohammedan festival which follows the Ramadan, or month of fasting, corresponding to our Lent. As the Mohammedans reckon by lunar months, this festival runs through all the seasons every thirty-three years. It commences with the appearance of the new moon of the month Shawall, and, as marking the termination of four weeks of fast-ing and restraint, it is looked for with great eagerness. At Constantinople it is announced by the discharge of guns and the sounding of trumpets and drums: the rejoicings usually last for two or three days. Another festival, called the Lesser Bairam, is celebrated 60 days after this one; but it is observed with much less ceremony.

#### Bala Limestone

Barting, boil-sing (Sax, buts, contention), is the act of smaller or weaker satimals attacking and harassing greater and atronger ones; as the baiting of bulls or bears by mastiffs or buildogs. Bull-batting was once a very favourite pastime in England; but the barbarity of the sport has led to its being given up in almost all olvilized countries, except Spain, where it is still very popular. The chief aim of the dog is to seize the bull by the nose, and to avoid being tossed by it. For this purpose, when properly trained, the dog creeps on his belly; while the bull endeavours to defend his nose by keeping it close to the ground, and attempts to toes the dog with its horns.

Baizs, bais (Ang.-Nor.), a kindof oarse open woulten cloth, with a long nap. It is sometimes frized on one side. It is without wale, and is wrought in about, like flannel. Edward III., in trying to stimulate the work irade of England, brought over a number of skilledworkmen from the Netherlands, and distributed them over the country. The various branches of the trade were confined to certain localities: thus the manufacture of

confined to certain localities: thus the manufacture of baize was restricted to the county of Suffolk, where it remained for some time. It is now principally manu-factured in and about Halifax, in Yorkshire. (See

BOULEN MANUFACTURE.)
BAJADERES, or BAYADERES, 50-ga-deers, a name given by the Portuguese to the singing and dancing-girls of Hindestan. They are of two kinds,—those who are employed as priestesses in the temples, and those who go about the country. The former celebrate with song and dance the festivities of the gods; the latter are employed by the grandees of India to delight and cheer them at their feasts.

BAKING, bai'-king (Sax. bacan) .- This term is applicable to almost any process of drying or hardening by heat; but is commonly restricted to the mode of cooking food in a heated chamber or oven. For making bread baking is resorted to by almost every section of the human race. It is also a common mode of dressing animal food; but is less effective than roasting, unless it be carried on in ovens through which air is allowed to pass freely. In reviewing the different modes of cooking meat, Lewes says, "Baking exerts some unexplained influence on the meat which renders it both less agreeable and less digestible. Those who have travalled in Correspond France must have represented. travelled in Germany and France must have repeatedly marvelled at the singular uniformity in the flavour, or want of flavour, of the various 'roasts' served up at the table d'hits. The general explanation is, that the German and French meat is greatly inferior in quality German and French meat is greatly inferior in quality to that of England and Holland, owing to inferiority of pasturage; and, doubtless, this is one cause; but it is not the chief cause. The meat is inferior, but the cooking is mainly at fault. The meat is scarcely ever roasted, because there is no coal, and firewood is expensive; the meat is therefore baked; and the consequence of this habitation is that the consequence of this habitation is that the consequence of this habitation is that the consequence of the conseque quence of this baking is, that no meat is entable, or caten, with its own gravy, but is always accompanied by some sauce, more or less piquant. The Germans generally believe that in England we est our beef and mutton almost raw; they shudder at our gravy, as if it were so much blood. I have ascertained that it is really the cooking, and not the meat, which is in fault; for, at the tables of great people, or resident English, where roast meat is served, the flavour is excellent.

In the inferior cating-houses, the meat is also

baked, for the sake of economy, and is notoriously deficient in that agreeable flavour which roast meat deficient in time agreeame navour which access horse possesses. If it were baked as thoroughly as it is in Germany, the meat in such eating-houses would be as tasteless."—Physiology of Common Life. Meat cooked in the improved ventilating ovens which have lately been introduced has all the sapidity and digestibility of meat mark. In fact the mode of condition by means. of roast meat; in fact, the mode of cooking by means of such ovens is now generally distinguished as ossaroasting. (See Oven.) The baking of bread, and the most important baking processes in the useful arts, are alluded to in other portions of this work. (See Regis, R

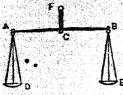
are alluded to in other portions of this work. Love Bread, Bricks, Pottern, Stoneware.)—For recipes in baking, see Mrs. Beeton's Household Menagement.

BALEMA. (See Witald.)

BALA LIMESTONE, ba'-ta (from Bais, in Merionethshire), in Geol., a series of limestone bets, alternating with slaty shales, constituting a portion of the Lower Climan formation of Walance. Silurian formation of Wales.

# Balance of Trade

Balance, ball-case (Fr. balance; Sp. balanca), a instrument for determining the relative weights bodies. There are neveral varieties. The ordicristian. The ordi on the first lead (see Lowes), which is called the beam (A. C. B.), with its follows (C) in the middle, and two scales (D and B) suspended, one from each extremity of the beam. The substance to be



weighed is placed in one scale, and the counterpoise, usually consisting of metal weights, in the other, the in-strument being susended from a ring immediately bove the fulcrum In the most delicate balances of this de-

scription, the ful-crum consists of a BALLECE. steel prism, which traverses the beam, and rests with its steel prism, which traverses the beam, and rests with its sharp edge upon two supports, formed of agate or polished steel; moreover, a needle or pointer is fixed to the beam, and oscillates with it in front of a graduated arc. If the two arms of a balance be not precisely of the same length, the scale appended to the longer arm will turn with a less weight than that hanging from the shorter arm; so, also, if one arm of the lever be heavier than the other, the scale on that side must preponderate. With such an imperfect pair of scales, however, the true weight of a substance may be ascertained, by weighing it first in one scale and then in the other, and deducting from the greatest weight half the difference deducting from the greatest weight half the difference of the weights indicated. The chemical bulance is an instrument of extraordinary delicacy. It is merely a pair of scales made with the greatest possible precision and accuracy, and is used for weighing portions of sub-stances separated by analysis. It is also used to weigh bodies to be united by synthesis. The whole theory of modern chemistry may be said to rest upon the per-fection to which the chemical balance has been brought. It is as necessary to the chemist as the transit-instrument and telescope are to the astronomer. Being so important and delicate an instrument, it is one of the important and delicate an instrument, it is one of the most difficult to use, the slightest carelessness being sufficient to nullify an observation made by its means. It consists essentially of the beam, the fulcrum, the joints of suspension, and the pans. The beam is generally made of brass, in the form of a long rhomboid. At an exactly equal distance from each end is fixed the fulcrum, which is generally a steel knife-edge, supported by agate planes. A contrivance is used for raising the beam, so as to keep the fulcrum from resting on the planes of support when not in use, in order to prevent the possibility of the knife-edge becoming worn. The object of having a sharp, hard knife-edge to prevent the possibility of the knife-edge becoming worn. The object of having a sharp, hard knife-edge resting on hard planes is to decrease friction as much as possible; it being obvious that sensibility increases as friction diminishes. The fulcrum should be fixed just above the centre of gravity, yet not too much so, so, the greater the distance between it and the fulcrum, the greater will be the stability of the balance; or, in other words, the balance will be less sensible, from the greater difficulty with which the beam is moved. Most balances have a contrivance for raising or lowering the centre of travity. The points of susfrom the greater difficulty with which the beam is moved. Most balances have a contrivance for raising or lowering the centre of gravity. The points of suspension are at each end, and are formed of hard steel knife-edges, working on agute planes, as in the case of the falterum. The points of suspension must be at absolutely equal distances from the fulcrum, otherwise, according to the properties of the lover, the weight indicated will be different in each pan. The pans are generally coated with platinum, to avoid corrosion, and are suspended by aller wires. To the centre of the beam is attached a needle index, which indicates the equality of weight in each pan by the equality of its vibrations on each side of the centre of a scale placed behind it. In some balances an index is fixed on the end of the beam, and viewed through a microscopu in its passage upwards and downwards over a fine scale attached to a fixed arm at a little distance from it. The whole is inclosed in a gless case, to preserve it from the action of passe or dust. Caustic lime is al-

rays placed inside the case, to absorb any musture that might astile on the working parts of the belance. Balances have been brought to marvellous partscion by Remadea, Kater, Robinson, Certing, Saors, and others. M. Stas, in his researches on the etc-mic weights of certain elements, employed a balance made by M. Saors, which turned with the ten-millionth part of the weight in each pan. Another, used by the same philosopher, weighed true to the two-thousandth of a grain. The weights used in such balances are made with the same precision: they will be described under WEIGHTS. A small piece of platinum wire, called a rider, sides along the beam, which is graduated, and indicates by its position a very small weight, on the principle of the steelyard; thus obvisting the necessity of using weights that are almost invisible 

ence as would endanger the independence of the others. In order to maintain this balance of power, it is not necessary that there should be anything like an equality among all the different states. It is generally sufficient that a few of the leading powers counterpoise each other; and in this way the safety of the smaller states is secured, as none of the officer would be disposed to allow its rival to add to the power by absorbing any of those minor states. We find the states of anoient Greece frequently guided in their statement by a combined the states of anoient Greece frequently guided in their statement by the states of anoient Greece frequently guided in their statement by a combined the statement of the statement of power among them; but it is only in modern times that the principle has come to be distinctly recognized and acted moon. In Europe it first became a distinct object of policy in the early part of the 15th century among the numerous small states and republics in Italy. Their justicusy of each other made them watch with the greatest keenness every movement or measure which might tend to increase the power of their neighbours; and, from a every movement or measure which might tend to increase the power of their neighbours; and, from a constant attention to this principle, they were able to maintain peace and general independence. When Charles VIII. of France invaded Italy, in 1494, Germany and Spain entered into a confederacy with the Italian states against him; and "from this era," says Ferguson, "we can trace the progress of that intercourse between nations which has linked the powers of Europe so closely together, and can discern the operations of that provident policy, which, during peace, guards against remote and contingent dangers, and in war has prevented rapid and destructive conquests."

The attempt to maintain the balance of power amour war has prevented rapid and destructed conquests. The attempt to maintain the balance of power among the different states of Europe has doubtless caused some wars, but it has unquestionably prevented more. It is this that has led to that great confederacy that exists among all the states of Europe, and keeps in exists among all the states of Europe, and keeps in awe the ambitious designs of any one of them that might desire to encroach upon the rights of its neighbours. At present the balance of power in Europe is principally maintained by the five great powers. "The grand and distinguishing feature of the balancing ayetem is the perpetual attention to foreign affairs which it inculcates; the constant watchtulness over every nation which it prescribes; the subjection in which it places all national passions and autipathies to the fine and delicate view of remote expediency; the uncassing care which it dictates of nations most remotely situated, and apparently unconnected with ourselves; the general union which it has effected of all the European powers, obeying certain laws, and actuated

the general union which it has effected of all the European powers, obeying certain laws, and actuated in general by a common principle; in that, the right of mutual inspection universally recognized among civilized states in the rights of public envoys and residents."—Brougham's Colonial Policy.

BALANCE OF TRADE, in Com., denotes the difference between the aggregate amount of a nation's experts and imports, or the balance of the trade of one nation with another. The theory of a balance of trade is founded upon the position, that a nation can only be enriched by an excess of its exports above its imports, which must be reselved in money; and that unless the money thus acquired shall be retained in the country.

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# Balance of a Watch

it might as well not have been imported. The theory it might as well not have been imported. The theory is founded upon the assumption, that, the precious netals alone constitute the wealth of a country; and hence, that when the moneyed value of the import of any country exceeded that of the exports, the country is so much a later by trade. This theory received the sanction even of Lord Pason, who, in speaking of the trade of England with foreign perts, says that case must be taken "that the exportation exceed in value the importation; for them the balance of trade must be received by the returned in coin or bullion;" and a sity be returned in coin or bullion;" and a large proportion of the restraints imposed on the free don of commerce during the last three centuries grew out of this notion. The Prohibition Act, 1 Will. & Mart, by which the trade with France was declared to making by when the trade with rende was declared as a satisfact, was founded on the fact that the value of the imports from that kingdom considerably exceeded the value of the exports. The balance was termed a the single from that kingdom considerably exceeded the value of the exports. The balance was termed a frient paid by England to France; and it was sagacrossly asked, what had we done that we should be obliged to pay so much money to our deadly enemy? Sounder views now prevail on this subject, and national wealth is not judged merely by gold and silver, which indeed are nothing but commodities, like other articles of trade. But the theory is erroneous, not merely from the false notions entertained of the nature of money which also from the idea that excess of exports is money, but also from the idea that excess of exports is excess of income. The value of the commodities imported by every country which carries on an advan-tageous trade invariably exceeds the value of those which she exports; otherwise there would be no fund whence the merchants and others engaged in foreign trade could derive either profit or return.—Ref. McCullock's Commercial Dictionary.

BATANCE OF A WATCH.—The movements of a watch are governed by a wheel called the balance, to which a vibratory motion is given. This wheel is impelled in one direction by the crown-wheel of the escapement (which see), and in the other by a fine spiral spring. The balance-spring, as this latter portion of the machine is called, consists of a coil of steel wire so delicately manufactured that 4,000 of them scarcely weigh more an ounce. As the rate of vibration greatly depends on the dismeter of the balance, marine chronometers, and some of the finest watches, are furnished with compensation balances, which do not increase in diameter with increase of temperature. In the compensation balance, the circumference of the wheel is made of two metals the orrentmerence of the wheel is made or two means having different rates of expansion, fast soldered together, the most expansible being on the outside. The compound ring is out through in two or more places, and is weighted at opposite points. When exposed to a high temperature, the ring expands, but, owing to the unequal dilation of the metals, each segment assumes unequal mustion of the metals, each segment assumes a sharper currie, whereby its centre of gravity is thrown inwards, and the expansive effect completely compensated. Under Mr. Dent's patent, both balance and balance apring are occasionally costed with gold by the electro-metallargic process.

Balancias, bdl'-da-sers, in Orn., a term applied to

DADANCES, our-un-ser, in Orn., a term applied to two slander membranous appendages, inserted on either side of the instathorax of insects belonging to the class Dispers. They are always small and movatle, and vary much in size and form, according to the class of insects by which they are possessed. They usually consist history are always to the class of insects by which they are possessed. amouse by mann may are possessed. They usually consist, however, of an elongated style with a small rounded head. Entomologists differ greatly as to the use of these organs. It is generally believed now, that they are the representatives of the posterior pair of wings, and are attached to the true metathorar. This, the same of the different has a manner of the posterior pair of wings, and are attached to the true metathorar.

#### Baldachin

the seeds, which yield, by expression, a fixed oil called seeds. The leaves are nightly acid, and are reputed to be authennance. The finite when maripe are bitter and yengative, but when rips, are exclude.

Balanwinous are, bit-deap-brut-see, to Bot, a nat. ord of disovyledmone plants in the sub-chass Monochlamptoe. These plants are parasites, and are found growing on the roots of various woody plants, especially in the tropical and sub-tropical mountains of asia and South America. They have no leaves; their stoms are of various colours, but never green, their peduncles are naked or scally, bearing spikes of flowers, usually white. Dr. Hooker saumerases thirty-seven species, which are divided into fourteen genera. Many are remarkable for their astringent properties; others are edible, and a few secrete a kind of wax. Two plants of this order are worthy of note; namely, Ossoscrino of this order are worthy of note; namely, Ossoscrino yalued as a styptic; the second yields large quantities of wax, which is used for making candles by the inhabitants of New Granada.

Balantius, bid-lim-ti-us, in Bot., a gen. of ferns.

BALATTIM, bid-lin'di.um, in Bot., a gen. of ferns. The species B. chrysotrichum is a native of Java, and furnishes the silky hairs which are imported under the name of Pakoe Kidang, and occasionally used as a styptic.

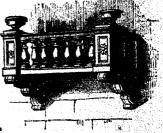
styptic.

Balansra, hi-laws'-ti, in Bot, the name given to a kind of fruit of which the pomegranate is the only example. It is inferior (i.e. adherent to the calva) many-celled, many-seeded, and indehiseent, said has a tough rind. It is formed of two rows of carpets placed. tough rind. It is formed of two rows of campels placed above each other, and surrounded by the calve; the seeds are attached irregularly to the walls or centre.

Balcony, bal-ko-ne (Ital bateo or patos, the box of a theatre), in Arch., a projection in front of the windows.

windows of

a house, supported on brackets of wood or stone. floor of the balcony is generally level with that of the room, and the windows reach to the ground, and open folding-



BALCONY.

doors to afford easy access to it. Balconies are gene rally fluished in front with balustrades or cast railings, and sometimes covered with a light cras-mental roof. The derivation of the name shows it to be an Italian invention. In Naval Arch., a beloony is a gallery outside the stern of a large ship, with access

a gatery outside the stern of a large sinp, was access from the cabins of the admiral and captain.

Batnachin, bal-da-chin (Ital buldachine, from Buldach, the Eastern name for Bagdad), a tent-like covering or canopy, of wood, stone, or netal, either supported on columns or suspended from above, and choose the desired of the stone of the ston supported on columns or suspended from shore, and placed over doorways, statues, altars, thromes, &c. They were formerly very common in this country over fireplaces, and many elaborate specimens still crist. In the Gürzenich Hall, at Cologne, there are some beautiful examples of beddachins over the Breplaces, which was the beautiful examples of beddachins over the Breplaces. wings, and are attached to the true metathorax. This, however, is disputed by some entomologists, who say that they are attached to the segment, which bears a pair of spiracles, and that they are connected with the function of sespiration. The former is the opinion most generally held, and is probably correct. All dispersions insects possess balancers; and as they keep them is constant notion, they are evidently of great importance to them.

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BALDESCE

to be our conditions the conditions of the condi culation in the scarp to greater activity, as frequent rubbing with a hard towel or hair brush, and the application of stimulants, as Spanish fly ointment Fre-quent shaving of the head is often attended with sucdessful results

BALDRICK, OF BAUDRICK, band' drik (Fr bandrier), a military band or girdle, much worn by the warriors in feudal It encircled the waist. times It encircled the waist, or was suspended from the right shoulder, and usually sustained asword It was often highly orname ited, and is to he seen on many elligics of knights

highly orname sted, and as to be seen ou many effigirs of kinghts

Baritwin's Propersons, baseld wass (in Chem)—
If nitrate if time is fused and exposed to the sun's rays, it will suit a phosphorescent light for a long time if hakes into the dark. This phenomenon is purely chimical, as no chemical change (ales place the reaction is as yet unexplained. (See Fivoristical, as no etc.). A package or bundle of goods is a nover, swiedo or otherwise prepared for carriage or transportation. Bales are always marked or numbered by the merchants they belong to, and the marks and imprises correspond with those in the bill of lading feeling winder the bule." Is a term used on the continual five welling goods wholesale, unopened and without sample.

Bits, bess!, in Mil art, is applied to any round mustance of lead or iron discharged from fire-arms. For small arms, as pistols and muskets, they are of lead; for the artitlery, of iron. The term bull, with a prefix antiferently expressive of its purposes, denotes a unmodification of virious combustible ingredients, as the bulls, light-bulls, anoke-bulls, stint-balls. The projectiles sparing three names are used either for giving light-or herassing the enemy, by giving out a dense michos or instruction in shape, and they are generally dired out of increase, and seldom out of guns. Light-bulls, and previous and eldom out of guns Light-spalls are the enemy at night, are composed of projected in any as treathed over a framework. They are start that are the enemy at night, are composed of projected in any as treathed over a framework. They are start as a compact mixture of subjects, sulphur, reads, and knowledge which a compact mixture of subjects, sulphur, reads, and knowledge out a framework. They are start the action of the description, and prich, after a compact of the one of all the given of the one of all the order of the one of all the order of the one of all the order of the one of all t

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SALEMAN . .

name to a celebrated west cod polis,—Pall-Mull. The ball is ways; such as being kicked by bat, thrown by the hand. GoLF, &c) BALLAD, ball-lad, the name w

Ballad, bill-idd, the name mans comple versified parasive, whether a often rude in style, adapted to be a panied by an instrument. It is thus to of one poetry, and from its peculiar handling, it belongs to the lyrical of (See Eric and Lyric) It is sensely mous with song, but the latter word employed, is always applied to a ly while the ballad has always womentamy or epical in it The word is considere or epical in it. The word is quasicous its original signification. At first the of Italian origin (bollats, Med. Lat. bullissin, to dance), was applied to a linded, the word has been used in its very loose and vague way. How thesis or the contract from a company to the contract of the were properly known as romances. Spain, again it was used to designs Spain, again it was used to designate only and again, lyrio-cepic, which is these designation and again, lyrio-cepic, which is the season in proper application. There is one general distinct which runs through the whole of the balled peak the European nations. This is the natural distinct which invariably occurs, almost as exactly as the tide of the places, or the thermometric indicates chimate, by which the lyrical or sunny almost dominates in the balleds of Italy and Spain, what those of the north, the gloom of the atmospheric seemery has transferred itself to the afficience of people, and rendered their bulleds much more opining and the state of the state o the Scandinavians and the Scotch, for exa is planty of conneality in their balled postry; but at is generally of a grin, and even wild humour; but deriving much more on the realms of tracedy them among the southerns. There can be no doubt that hadded have formed the first rude attempts at very among all nations, and that the earlier heroic posma, or even epics, such as those of the Spanish Cld, and the Mibelingen Lucd of Germany, grew out of some such simple beginning. Old Fleisher of Saltons and if he were permitted to make the balleds of a nation, he salted not who should make its laws (Political Works, 1749), so strong a balled had he in the revolutionsming Emdency. permitted to make the halladis of a makion, he seited not who should make its laws (Political Westes, 1749), so strong a belief had he in the revolutionsing isodemey of an kerose ballad or song. The northern Seales, the Scottish and English mustires, said the contraction of the word lay itself (Cier, Ruch) was long applied to such composed herois balladis, or shaped lays of love. The word lay itself (Cier, Ruch) was long applied to such compositions in degraining, before the Italian word ballad came into nearmons with the word ballad nan been used shaped which was long applied to word to the true of the little of the word ballad has been used shaped which have on Song Writing (London, 1770), sees, "The nature on Song Writing (London, 1770), sees, "The nature poetry of the country was reserved meraly for the humorous and burlesque, and the term ballad was brought by outcom to agnify a connectory, toke in low, familiar language, and accompanied by a droit tervial time. This occurred about the period known as the Restoration, hetween the reign of Charles II. sand the times of Theorem and the least greening allowed among well-read men, that the best specimens known of the old popular ballad are to be found in Sectional, or more properly, perhaps, along the Section should be the or the sandject, that many of these stratisticates where on the sandject, that many of these stratisticates, and the surrent all giver the knagdom of Sections. No doubt,

Balliol College

in numerous instances, these old ballads had their integrity tempered with, and they were not transmitted from one generation to another without innumerable transformations. A large proportion of them have doubtless been preserved by trail tradition, and during every successive stage which the race mide in advancement, one could trace this progress in the very ballads which they had transmitted by the linguistic changes which their speech had undergone. To take a single example, almost overheady believes that "that grand old brilled of Sir Patrick Spens," as Coleridge called it, derived its origin from a very carly age; and yet it is remarkable the number of variations to which it has been subspicted. Any one can easily satisfy himself on this point by a comparison of the different versions of the siefs, and Avioun's; and yet a sagacious eye will have very little difficulty in detecting the granue old composition from its more modern and spurious interpolations. position from its more modern and spurious interpolaspuriousness becomes, in the region of these old balleds, more a problem for personal ingenuity than for anything more solid. For aught we can tell, the original forms of those old compositions may have coriginal forms of those old compositions may have been the gradual accretion of centuries, and of various suthors, rather than the production of any single individual. Very likely, every one of them is not only of diverse authorship, but various hands may have touched up the different poems, each according to his fancy. The English Robin Hood ballads are another instance in point. Nobody at the present day can say when or where, or by whom, those rich old have according and well there even be no doubt. can say waren or where, or by whom, those her our hays were trainsmuted; and yet there can be no doubt that they have been so. "Fair Helen of Kirkconnel Leag!" an old Scottish ballad, presents as much of the elements of true tenderness and wild possion as we can find in the whole range of modern poetry. "Chery Chase" and the "Battle of Otterburne" are epi-Chase and the Battle of Otternine are epic narratives on a much larger scale than usual. "Adam Bell," and "Clim o' the Cleugh," and "William o' Cloudesley," stand between the latter poems and such simple ballads as those of "Johnny Armstrong" and "Edom o' Gordon." The earliest English ballad new "Edom o' Gordon." The earliest English ballad now remaining, according to Ritson, an excellent authority, is a "Cuckoo Song" of the latter part of the reign of Heary III., beginning, "Sumer is icumen in, Linde eing cuocu." The earliest specimen of the Scottish balled, after that nation became English-speaking, is given in the "Rhyming Chronicle" of Andrew Wyntoun, prior of Lochieven, about the year 1920, in which he relates the song that was made on Alexander III. of Scotland, who was killed by a full from his herse in of scottand, who was killed by it all from his force in 1286. No modern nation has cultivated the composition of hallad posity so assiduously as the Germans. No doubt we have many specimens of the modern ballad; as Goldsonth's "Edwin and Angelina," Aytom's "Lays," and the "Bon Gaultier Ballada;" but there is nothable the classical turn given to those old popular compositions which we meet so often in modern days in Germany. The best English representation of this sort of ballad is to be found in Coloridge's "An-cient Mariner," containing many more sustained im-ginative flights than the old ballad could pretend to, and ensigzing, with a much more incessant acuteness, and analyzing, with a nation more theesant acuteness, the facilities and passions of the human heart. Yet this exquisite poem is the simple ballad all over in its style. The "Lenore" of Burger brought in a new era of ballad writing in Germany. He confined the name 'ballad, as Coleridge has also done in mitation of the the same parties with account to the latest the continued of the same parties with accounting the latest accounting the latest the belief, as Coeringe has also one in matter of him, to are epic marrative, with something fatulous and supernatural in the background, but still possessing enough of earth to interest the mass of humanity. Schiller, Ofthe, and Uhland have followed in his wake; and the latter, who, we believe, still survives at Tiller. bingen; has done much in modern times to familiarize nungent me gone much in modern times to familiarize the German mind with this species of composition. The ballad poetry of the northern nations, particularly those of Leeland, of the Farce Islee, of Donmark, and Norway and Sweden, retain their meient character to the present day. There is a peculiarly close affinity hetween many of these Seandinavian ballads and those of Scotland and Fagland, which has been noticed by various writers, both in this country and on the con-tinent. Not only have Pinkerton and Jamieson siluded

to this close relationship, but even Nyerup, Goijer, and W. C. Grimm have spacially commented on it. This reaemblance is to be traced both in the general plan and spirit of the poems and in the actual ametrial basis on which the structure of the ballad is rearred. Whether we are to ascribe this similarity to so remote whether we are to seemble the simularity at the remove a cause as the emigration into this country of the ancient Scandinavian peoples, or whether we are not rather to lean to the conviction of the ready transmission of fact or fiction of a stirring kind from one country to another, must ever admit of considerable doubt. The most complete collection of English and Scottish ballads in existence is an American one now

in course of publication.

Balbast, bull-lust (Ang.-Sax.), in Mar., a certain portion of iron, stone, gravel, or such weights material, placed in the bottom of a ship when she has either no cargo, or too little to bring her sufficiently low in the water. In the royal navy, fron ballast alone is used, in pigs of about 3 cwt. Iron ballast possesses the advanpage of about 3 cmt. From banks possesses the account tages of lying in a small compass, and of being, from its greater cleanliness, more healthy for the crew than shingle, gravel, &c. When a vessel has no other loading, she is said to be in ballast. The quantity of ballast, and its method of stowage, differ in different vessels. Masters of vessels are compelled to declare their amount of ballast, and to unload it at certain places.

BALL-COCK, bawl'-kok, a hollow sphere of thin metal, attached by a small rod to the cock of a water-distern. When the cistern is empty, the water flows in at the tap, but, with the rising water, the hollow sphere, the ball-cock, is buoyed up, and by this means the tap is

turned off when the eistern is full.

Baller, bull-lat (Gr. bullizein, to dance; Ital. bullare, to dance; Fr. bullet), an entertainment on the stage, in which a story is represented by dancing and pantonimic gestures, accompanied by appropriate music. In operatic performances a dance is frequently introduced under this name, such as the famous Pas des Patineurs, in Meyerbeer's opera "Le Prophète." The intricate figure-dances of the subordinate dancers are generally pleasing and well done; but the bounds, leaps, and pirouetting of the principal performers seem rather to be wonderful feets of strength and activity than actual daucing. Among the Greeks, the art of expressing passion and sentiment by dancing was brought to a great degree of perfection. The modern bullet was originated in Italy, by Count Aglio, of Savey. Eultagerini, a musician, introduced it at the court of France, in the time of Catharine de Medici. Since that time the ballet has retained possession of the stage, to the detriment of dramatic performances of a more devated nature. Noverre, a Frenchman, brought the ballet to its greatest degree of perfection about 1750.

BALLING PROCESS, immilising, in Chem., a term applied to the process by which sulphate of soda is converted into curbonate of soda. Sulphate of soda, limestone (carbonate of lime), and small coal are intimately mixed, and subjected to heat in a reverberatory furnace. Sulphide of sodium is at first formed, carbonic soid escaping in large quantities. By carefully regulating the heat, the limestone gives up its carbonic acid to the soda, receiving sulphur in exchange. The resulting mixture is termed black ash, or ordered coda, and contains carbonate of soda, line, and solphide

coda, and concains carronnate of acous, time, among an of calcium. (See Soda.)

Biliot. College, built-hi-ol, Oxford, was founded by John Balliol, of Bernard Castle, Durham, and Dervoquilla, his wife (parents of John Balliol, king of Scotland), between 1263 and 1268. Its revenues were soon augmented by the munificence of succeeding benefactors, particularly Sir William Fenton and Sir penchacters, particularly Sir William Penton and Sir Philip Someryle. It has at present ten fellowships and ten scholarships, open to all candidates, without regard to the place of their birth, residence, or edu-cation; also two followships and two scholarships, confined to persons elected from the grammar-school at Tiverton, in the county of Devon. There are also the Snell exhibitions, ten in number, tenable for five years, the nomination to which is vested in the principal and professors of Glasgow University, who appoint two anunally; the Jankyns exhibitions, two in number, tenable for four years, filled up by computation energy those members of the college who have not exceeded

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tary engine used

by the ancients for throwing stones, eas the catapulta was

for throw

particular construction of the

ing heavy darts and arrows fibe particular con-

ballusta is not exactly under stood or, rather,

it seems to have been made in

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constructed with levers and bars, and snother with

puliers, another

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ATTTTTAM

and others with a to thed wheel with a crane, in all the states and others to an instrument average by Bolins, for measuring the velocity of manager of mutaket-balls. It consusts of a large he was book of wood, plated with row at the back, and fixed of any transfers of the party of the part

is in insurerse bur of man, which serves as an axis of assignation. In the lower end of the principles as abundant passing loosely through an ortice in a horizontal but in the franceura. The high of the shand drawn out by the pendium, on hing stack the state of the shand frawn out by the pendium, on hing stack the state of the short in larget to the short in larget

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Bearing bott-seem in Aich, the courtrard or open made of a forthied castle built in the Mild Ages

Attachemical-loor (Fr ball m), m Acconante alurge the my pear charged beg, ma'e of paper er virushed and likely with rare lied are or bydic gen gas. As and likely with rare lied are or bydic gen gas. As an easieste, as either ones, are lighted than common and the hallows guese, and he able to carry up weights along think he descent. The discourse in the latter part with lare described, which is only about one than the second produced the possibility of the amount of the second in the second the possibility of the amount of the a

Montgolfer, raising wracked ves certainly, in particular cas kinds, for recomouting the course of vessels, leagues distance" V that some of the ideas of the in put in practice These in golfiers, to distinguish them from August of the same year, a balls was sent up at Paris A second immediately afterwards and m golfices sent up from Paris the consisting of a sheep, a cock, and of October, M. Pilatre de Roman and on the 19th 3'4 feet, the b ropes in both instances he an I the Marquis d Arlandes ; the harardous and, tall then, navigating the air in a free balloon made in a Montgolder, at the Child noir Passy The siv was partie north west have notice that the machine wa in eight minutes, notwithstandin routy to set off It was at first ra machine awhile with ropes to would hear and see that all was prevented at from rising vertically which it came into contact with a ma le several rents muit. It was by and it two hours was set right a filled it again set out with the same car fit rese in the most majestic and it was 270 feet high the intropid sorage hats to the spectators The mac tule of at least 1 000 feet as ad between the Leone Militaire Invalides being within view of all Par box dusmined a unit this training travel turther agreed to descend the will was carrying them above the preserved their presence of mied, in had crossed over Parm Phoy then de on the pla n without having felt the venumer and having in the car two-this This ma hine was 70 feet high, 46 in d tained (0) 000 cubir feet, and carrie 1 500 to 1,701 lb At Plate XII, fig 1, mg of this ballon These experien These experi On December 1, 17-1, MM Charles an ascent in a balloon inflated with machine was spherical, At test in d sisted of silk cratcu with a care over the upper part of the balleon astructed above, which could be opened in any of our is and shut by a spring. afford an outlet im the hydr destend, or found it necessar of gas The filing lasted sev was commenced from the garde. The balloon quickly rose to a hel ans omnoon quonty rose to a neegy-appearing from the eyes of the spe-loup descended at Nee's, twenty dis-but as soon as M. Robert's sampled; machine rose agains with great lands, a 180 feet. It supunded with most

to regulate the movement chule was also fastened to this dog was sent down in safety. sme frequent. The Duc de rs, Robert and Charles; r. Jeffries, of Boston, U.S., om Dover, and came down in nnee. A drawing of M. Blanchard's at fig. 3, Plate XII. The first fatal red in June, 1795. M. Pilatre de Rosier, les young man named Roman Lainé cross from France over to England. M. occasion united the two kinds of balee of securing the advantages of both. pier belloon he used hydrojen gas; the lower bunkselfer. By means of the lower in the lower at the lower at the lower and sink at pleasure, not presible with hydrogen, for a balloon a this gas, when once descended to the earth, the lower with the hydrogen and the lower id with this gas, when once descended to the earth, and he same weight without being it meer; while, on the contrary, by increasing or miniting big fire under a balloon filled with heated it can be made to rise and fall alternately. But a complete a caused the death of the projector like complanion. The hydrogen, by its expansion was a subsequent and on the research of the projector like complanion. ore rare air above, pressed down turough the to need, of the balloon, and reaching the fire of controller, the whole body of gas was inflamed, the warmers were precipitated from a height of the seashore. During freshis revolution, an aërostatic institution was shand as Reudon for the education of a corps of the seashore. The seashore of the seashore of the seashore of a corps of the seashore s as a means of reconnoitring the enemy. the republican armies had a balloon attached but the experiment was soon abandoned. The time has, however, been frequently employed in the subsequently to this period. In the war with the first party of the second of balloons to ascerthe strength and position of her foes; and at the strength and position of her foes; and at the er of nor flovenment, Mr. Coxwell, a very strength and experienced agrial voyager, has made during shem fights at Aldershot, with the at the present strength in America, the Federals are the present strength in America, the Federals Tagnett are of the balloon as a means of effect. organisms. In 1802 there were two remark-openitie experiments.—General Money made free Norwick, but, his balloon dropping into the had a barrow escape of drowning. M. hasting ascended from London, came down to in a parachute of his own invention. In the religious depth of the continuous and the englishment of the continuous and the continuous and the englishment provided with instruments ith magnetism. They reached a height of constitue earth, and M. Gay Lussac subsan altitude of 23,000 feet. Two years best the estronomer royal at Naples, so higher than M. Gay Lussac had for resched an atmosphere so rare-e balloon. The shattered remnants i parachute, and made the descent so the life of the savant and his comthe most successful and experienced uta was our own countryman Mr. it substituted common coal-gas for fisting medium, thereby effecting a st. One of his most daring feats wate, is company with two friends, he Wenthull Gardens with the intenthe goatheant. These intro Lepson on the 7th of Novemb

Balleon

4. Plate X11...a ded upon ballooning w Mr. Green made as of a ball regulate the course of a balloon of windraill, which he placed in the front to raise it to an aerial current having it was desired to take. M. Transon in ten or air-ship, consisting of two balloons a other by a cable. These balloons w other by a cable. These balloons were of buoyancy; the lighter one was intended to greater altitude than the lower one, the velocity regulated by means of sails. In 1890 Mesers, R and Marsh conceived a complicated machine, twenty small balloons were attached to a light fra work. Sir George Cayley contrived a machine to a a steering apparatus was affixed. Mr. Partridg put forth a plan wherein sails and vanes, put forth a pian wherein sais and wants, and a scame-night fed with liquid fuel, are amployed. M. Eubriot invented an oblong balloon with astla attached to a car. None of these experiments, however, achieved any practically useful assulf, About the year 1840, "Dr. Palli, of Milan, auggested About the year 1540, T. Kain, of mann, arguered that the structure of a fish should form the model for an arrial locomotive; but he was forestalled in his obvious but fallacious idea by other parties in England. In 1812 Mr. Henson took out his patent for that abrial machine which lived its little, with our relarity and then went out of sight. A small mear engine in a cor was to propel a light framework fect long; and a tail of 50 feet long was to serve as rudder at one end; but whether the machine a raise itself to a height, or could propel itself by engine, or could steer itself by the tail, were inquire nover satisfactorily answered. Next came M. Monge's copper balloon, constructed at Paris in 1944; it was about 30 feet diameter, formed of sheet copper one two-hundredths of an inch thick, weighed 300 in, and was empable of containing 150 lb, of hydrogen. The egg-shape, the fish-shape, the fan-shape, the kin-shape, all have been proposed time after time. Mr. Dill patented two machines, a balloon motor and a parachute motor, having both a custaining and a pro particular actor, having both a statisting and a pro-polling power, which constituted its own sustaining power. The plan looked ingenious upon paper; but this is not very high praise." The Eng. Cyclopedia, "Arts and Sciences," in 1852, published a scheme for steering balloons by means of rudders, levers, and sails. In 1856, the model of an "Archimedann balloon" was exhibited, in which a variety of ingenious applie were combined : the balloon itself was of form, with hemispherical ends: there were my give it a progressive motion; there was a screen it; there was a chemical engine to supply it w tive power; but the project has never been part In 1853 Lord Carlingford placed in the Di tion a model of his "Archedon," or serial was formed of a boat with a wheel in fro behind; at the sides were a comple of co neglect with which his invention was r "The first chariot I made was place exhibition, yet, strange to say, alther ple as was the principle of it, it nor even examined." The energy nor even examined." The en-grapher M. Nadard may as inventor of the largest aerial ma period had over ascended into the loud note of preparation, the mo structed after M. Nadard's design the Champ de Mars at Pari 1863. The somewhat appropri the balloon was "Is Genet." and of construction of "the G



Balloon

yards); in height 100 feet; to inflat cultic metres of pay line immone; a posed of two shinknesses of white quality, sewn entirely by bland sun quality, sewn antirety by illust sun double-thiched, task which employed the continuous labour of N women during on wheeth, Beneath this immense but and connected with it, there was a smaller ballon, called the "compensator," to receive the ciners gas caused by the distantion of the Gran's in the higher atmosphere, and thus prevent its waste and inher caused by the distation of "the Genn" in the higher atmosphere, and thus prevent its waste, and enable the acconants to preserve the means of continuing their voyage. The ear, or what replaced the car, was a small collode floore, consisting of a ground-floor and a gallary, the entire dimensions being about 8 feet in height, by 18 feet in length. In this car were comprised a small printing-office, a photographic department, four, beds, layatory, &c. The entire car was consider submersion impossible. Twenty thousand yards of white silk at six shillings per yard were required for the construction of the machine. On this occasion its occasion its occasion its occasion its occasion its occasion. the construction of the machine. On this occasion it made a safedescent at Barcy, two leagues from Meaux. Phis monster made subsequent voyages, and upon one occasion the passengers were subjected to great danger. "The Gight" has since been relegated to that obscure depository where so many of its predeces-sors have found obliviou. An engraving of "the sore have found obliviou. An engraving of "the Giant" is given at fug. 5, Plate XIII. A huge Montguiffer, or heated air balloon, ascended from Cremoree Gardens several times during the year 1804. The "Ragie" of M. Eugène Godard far surpassed eventhe "Giant" in size, as will be seen by the following statistics, which go far beyond the dimension of any other balloon yet made. In height it was 17 fest 7 inches; in circumference 95 feet 9 inches; in aren 30,000 feet ; in weight 2,005 lb. ; in cubic capacity 499,556 feet. It contained 4,793 square yards of silk, in 1,910 pieces of 96 stripes; 14,203 feet of stitching; 96 cverlaps of joints, making 13,848 feet more of sewing, and 17,244 feet of galloons, which form the network: these galloons were stitched on both sides, and contained 24.346 more feet of stitching. Twenty-four compart-ments in the parachute which surrounded the upper partion of the balloon (see engraving, fig. 6, Plate XIII.) required 6,824 feet of stitching. The whole contained 69,324 feet of stitching, requiring 2,706 days of work. The valve was 4 feet 8 inches in diameter; the dishipped car waighed 555 lb., and was 13 feet 2 inches in diameter. In the centre of the car was an 18-feet stove, including the chimney, 980 lb. in weight, 6 feet 6 inches in dispreter, composed of three cylinders apart from each other, invented by M. Godard, with the view to counteract the effects of the radiated heat upon the occupants of the car. Inside the flue was placed a metal colonder to intercept sparks. The combustible matter sequired for filling the balloon with heated air was rve-straw compressed into blocks. The total weight of the machine (including grapping-iron cords 400 lb., two supplemental pumps 150 lb., and combustible 500 lb.) was 4,620 lb. This gigantic machine made several trips from London in salety. During a period of forty-four years, from the date of the ascent made by Signor Brinschi in 1808 to the year 1850, when MM. Bigg and Barral made an ascent from the Observatory at Paris, no attempt had been made to put the balloon to a scientific use. The last-named sacaus made several ascents, and collected some information con-ducing towards the science of meteorology. Mr. Welsh's experiments, conducted at the expense of the British Association, were carried out in the year 1852.

A great number of observations were made by this gentlemen, the result being the following deduction as to the decline of temperature with elevation: that the temperature of the air decreases uniformly with the height above the earth's surface, until at a certain the height above the earm a surrace, unto at a certain elevation, varying on different days, the decrease is arrested, and, for a space of 2,000 or 3,000 feet, the temperature remains nearly constant, or even increases by a small amount; the regular diminishing being alterwards resumed and generally maintained at a rate slightly less rapid than in

pacificate. The preventy objects of the (the expense of which was defrared by Association) were the determination of a ture of the air and its begrometrical states whether miss; to determine ture of the air and its begrometrical states at different selevations up to five miles; to determine the distribution of the air; to determine the original state the air by means of ordine papers; to determine time of vibration of a magnet in the earth, and different distances from it; to determine the tempture of the dew-point by Daniell's dew-point by meter, Regnault's condensing hygromesar, and employing the dry and wet bulb thermometers ordinarily used; to collect air at different identities note the height and kind of chords their deservations. to note the height and kind of clouds, their de-and thickness at different clevations; to deter-the rate and directions of different currents in atmosphere; to make observations on sound; to atmospherical phenomena in general. In a read before the Royal Institution, Mr. Glaid scribed the various ascents made by him, and gets the results of his observations. These observations may be thus summarized:—1. That the temperature of the air does not decrease uniformly with the height above the earth's surface; and consequently the theory of a decrease of one degree of temperature for an increase of elevation of 300 feet, must be abandoned. In fact more than one degree declined in the first hundred feet when the sky was clear, and not so much as one degree in 1.000 feet at a height exceeding five miles. These experiments are the first to yield any definite information on the subject : more experiments are required to settle the law satisfactorily, but its effects on the laws of refraction will be great. 2. The degree of humidity decreased wonderfully with the heig till, at above five miles, there was scarcely any aqueous vapour at all. 3. That an aneroid barometer can be made to read correctly—to the first pludecimals certainly, and to the second place of dec probably-to a pressure as low as seven inches. 4. That a dry and a wet-bulb thermometer can be used effectively up to any height on the earth's surface where a man may be located. 5. That the balloon does afford a means of solving with advantage many delicate questions in physics. Having passed over the whole ground of the subject, we have seen that the balloon may be used with advantage in war, and as an agent may be used with advantage in war, and as an agent for the gathering of scientific data; but that, as a neans of hearing man through the air at his own will and pleasure, and according to any direction sought by him, the machine is, up to the present time, of no avail. The subject of ballooning has quite recently received renewed attention, and several ingenious minds have conceived and exhibited divers forms of machines for carrying man through the air. There is an Aëronantical Society lately formed, which has held meetings at the rooms of the Society of Aria; and an exhibition of models connected with the subject has accord times taken place at the Crystal Palsoe. Mr. several times taken place at the Crystal Palace. Mr. Charles Tomlinson, in the appendix to the last edition of his valuable Cyclopadia of the Useful Arts, makes, the following sensible and practical observations:

"Although, perhaps, it would not be quite true to say that the search after the directive power of a lattoon must be ranked with that for perpetual motion, or for the squaring of the circle, yet the solution of the problem is attended with so many difficulties as to be all but impossible. Skilful engineers and profound mechanicians avoid the subject, just as good mathe-maticians shake their heads at the squaring of the circle, and chemists smile at the transmutation of metals. Badly educated men declars this to be the result of prejudice; they call it 'slavary to preconceived notions,' forgetting that the world has ac time to be constantly reconsidering questions which have been set at rest by well-established principles. Every now and then we meet with persons who declare for Isuac Newton's astronomical doctrines to be quite wrong, and astronomy in general to be at fault. the lower part of the atmosphere, and commencing the strong in general to be at ladd. It is not too man to say that such persons do not underfrom a higher temperatures has would have existed but for the tatherniption noticed. In the course of the but for the tatherniption noticed. In the course of the them to do is to remain quiet. We would also give last few ream Mr. Glaisher, of the Royal Observatory the same advice to any of our readers who may wish

and clouds in booked for above it. These hazardous suberprises have so far resulted in no practical good, nor do they seem likely to lead to any useful object,

except it be for military reconnectring. Balleons must be waited along by the currents of air in which they float paragraphy independent of any power that can be applied to them from within. Enveloped in clouds, the abronant may be swept along with the switness of a tornade, with nothing to indicate to him that he in not in the quiet of a calm; and of course with no means of knowing the direction of his progress, when he cannot be aware of any progress at all. As the course of the winds, at different elevations, becomes

more perfectly understood, balloons may to some exused for passing from one part of the country

to another; but this can be only along the lines of their currents, and, in approaching the surface, the voyager must be exposed to its fluctuating breezes, with no ability to select the place for his landing. Man has got to discover some new principles that shall

give him a partial control over the elements, or else thoroughly comprehend their operations before he can

apply to any important purpose the power he possesses of rising into the air." Mr. Monck Mason, describing his serial voyage with Mr. Green, in the great Nassau balloon, to Germany, says, of the extraordinary silence

that reigns in the upper air : "No words can in truth

sufficiently represent the remarkable condition of the ekies with regard to the absence of sound, or convey

any just notion of the extent to which that particular

every other situation in life-on the summit of the est mountain, in the depth of the lowest cavern ; in the desert and on the sea; in the dead of night and the stern repose of the veriest calm-sound, to a certain extent (however it may escape our habituated faculties), always exists. The vicinity of solid bodies, the resistance of the air, the influences of changes of

temperature upon adjacent matter, nay, the very pro-cess of vegetation itself, are so many sources of sound

from which man is never entirely free, until the aërial car has snatched him from their influence, and transported him to regions where none such are ever to be found." In another place the same writer says: "It has frequently been inquired of me whether, under

circumstances of such excessive elevation, any symptoms of convexity can be detected in the appearance of the hegizontal piane, such as a knowledge of the real form of the terrestrial globe might have authorized us

to expect. When, however, we consider the immense disproportion which exists between the actual diameter

of the earth and the utmost altitude to which man cease to look for such a result, or be surprised at observing the deficiency. Were we to assume an elevation of forty-two thousand feet as the ne plus ultra of advoustrical enterprise, still, computing the earth's

condition is capable of affecting the human organs. All, in fact, that can be said upon the subject by way of illustration is that here, and here only, absolute

silence can be said to have any existence at all.

struggle between the French and Germans, in 1870, to become a balloon mechanician. Let him devote his time and means to the acquirement of a good, sound knowledge of theoretical mechanics, and he will then have no taste for feating in the radiculous ginoracks which are almost severy day monocost for sailing in the air." A writer in the New American Cyclopedia remarks: "One of the most interesting meteorological phenomena notinged by the accounts is the occurrence of the radiculous in strata which are separated by a clear space of some thousand feet, it may be, in thickness. Any layer of clouds from which the rain falls is sure to be succeeded by a stratum of clear blue sky; and eger this is found another cloudy belt. If rain fall from this too, the same succession of blue and sky and clouds in the hook of or above it. These hazardous to become a balloon machanician. Let him devote his ballooning was not conspicuously turned to account.

—Bel. Temlinson's Cyclopsedia of the Useful Arts; Mr.
Monck Mason's Aëronautich, or Sketches, Theory, and Practice of Adrestation.

Pressing of Advantation.

Bankoon, a French term for a quantity of glass.

Twenty-live bundles of white glass and twelve and a half of coloured glass make a balloom.

Bannon ball-bat (Fr. ballote, a little ball), is a term employed to denote a secret method of volting; so called from being usually done by means of little balls, which are put into a box, and afterwards counted, thereby to disclose the opinion of the majority, without discovering that of any individual voter. Usually the balls are of different colours—white and black the balls are of different colours,—white and black, the white being "for" and the black "against;" and hence the expression to "blackball" one. Somehence the expression to "blackball" one. Sometimes, in place of the balls being of different colours, the box is divided into two compartments, one of which represents the prox, the other the constinues sometimes, in place of balls, folded pieces of paper are used, either containing simply "yes" or "no," or the name of the caudidate or candidates whom the elector supports. In clubs, societies, and other similar bodies, voting by ballot is the mode usually adopted in the election of members or office-bearers. The term however is principally important in its The term, however, is principally important in its political sense, as applied to the great question of secret or open voting in the election of members of the legislature. Secret voting was practised by the ancient Greeks by means of balls, stones, or shells, with marks. Among the Romans, tabula, tabella, or tickets, were chiefly used; and different laws were from time to time passed regarding the system of secret voting. the Gabiana Lex, for the election of magistrates, dating from about 140 B.C. In modern times, the ballot was long in use in the Venetian senate. A tract, entitled, "The Benefit of the Ballot," said to have been written by Audrew Marvell, was published in the "State Tracts," 1693; and the ballot was first proposed to be used in the election of members of parliament in a pamphlet published in 1705. In France, secret voting existed in the Chamber of Deputies from 1845, to 1845, and was employed after the coup d'état of 1851. It has also been adopted in many of the United States of North America, and became part of the electoral law of Vic-toria in 1856. The subject of the ballot has occasioned frequent discussions and divisions in parliament, and since 1835 it has been an open question in all Whig governments. On June 30, 1857, the House of Com-mons rejected the ballot by a majority of 69, -199 being for, and 257 against ic; and on April 23, 1861, a motion to bring in a bir! on this subject was negatived by 279 against 154; majority 125. Our limits necessarily pre-clude our entering upon the arguments that are ad-vanced on either side. There are, doubtlesse, cvils connected with the present open system of voting: but would these be done away with, or, rather, would not their place be occupied by others of a worse nature, if the ballot were adopted? This is a question that must necessarily be considered. Would all intimidation and bribery cease if secret voting were had recourse to? or would these be carried on as before. from a reliance upon the general good fuith and honesty of mankind? Might the landlord not still ask his tenant how he intended to vote, and would the tenant escape by silence, or would be purchase peace by a falsehood? If the latter, then, certainly, the ballot affords him a means of avoiding detection which the present system does not. While it might prevent had influence being exerted over the good, would it not destroy the good influence which publicity exercises over the bad? Publicity is, further, an essential element in the British constitution. In all other matters, persons who are charged with a duty have to perform persons who are charged with a duty have to perform that duty in public;—are there sufficient reasons for departing from it in this case? But the principal argument against the ballot, and that which its supporters have never yet satisfactorily answered, is, that the suffrage is a trust vested in certain classes of the people for the benefit of the whole. Every elector is hence bound to use his suffrage, according to his best and most conscientions judgment, for the good of the public; and every one of the public has a right to know in what way that suffrage has been exercised, and has in what way that suffrage has been exercised, and has

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radius at four thousand miles, and reckoning five thousand and eighty fact to each mile, the prominence of the speciator beyond the surface of his horizon

of the spectator beyond the surface of his horizon would even then amount but to the thousandth part of the extreme lateral extension; in other words, he would only have reached a diameter beyond the plane of his vision as great as the thickness of the amailest letter we are now employing would project upon the face of a globe of ten inches dismoter." Is the war in Italy, in 1806, the French made use of ballooms for reconnoitring purposes; but in the

Balm

Rambusa

just cause to consider himself wronged if it is performed otherwise than honestly and carefully. "I contend," said Lord John Russell, in a speech on this subject, "that the whole community; whether electors or nonelectors, have a deep interest in knowing how the votes are given which elect those who are to dispose of the welfare of the state." One of the ablest men and clearest thinkers of the present day, Mr. John Stuart Mill, in writing upon parliamentary reform, says: "Thirty years ago it was still true, that, in the election of members of parliament, the main evil to be guarded against was that which the ballot would exclude—coercion by landlords, employers, and customers. At present, I conceive a much greater source of evil is the selfishness, or the selfish partialities, of the voter himself. A base and mischievous vote is now, I am convinced, much oftoner given from the voter's personal interest or class interest, or some mean failing in his own mind, than from any fear of consequences at the hands of others; and to these influences the ballot would enable him to yield himself up, free from all sense of shame or responsibility."—Ref. On Repre-centative Government, by John Stuart Mill. 1861.

BALM. (See MELISSA.)

BALM OF GILEAD. (Nee BALSAMODENDRON.)

BALEAN, baul-sam (Gr. beleamen), a name formerly given to almost every oily or resinous substance exuding from trees; but now used by scientific men to denote a vegetable product containing either benzoic or cinvamic acid. The true balsams are much used in medicine on account of their stimulating, expecterant, and tonic properties. The most important are the balsams of Peru and Tolu (see MYROSPERMUM), benzoin (see STYBAX), storax, and gum-wax (see Liquinamera). All those substances are vory fragrant. They vary much in their consistence. Thus benzoin is solid, hard, and brittle; Peruvian balsam is fluid; and Tolu is internediate, being a very soft and readily-fusible solid. Copsiva, commonly called balsam copains, is not a true balsam, but belongs to the class of olco-resus. The same may be said of Canada balsam. Several medicinal mixtures, in which oils enter, are commonly included under the head of balsams. Thus the preparation known as ladsam of sulphur, used as an application to foul ulcers, consists simply of flowers of sulphur in clive-oil.

BALSAM. (See IMPATIENS.)

RALSAMIPLUA, bill-si-mif'-lu-ii, in Bot., a nat. ord. of dicotyledonous plants, consisting of only one genus. The species are balsamiferous trees found in the warmer parts of India, North America, and the Levant. By some botanists the order is named Allingiacca. (See LIQUIDAMBER.)

BALSAMINACEE, bal'-ca-mi-nai'-se-e, to Bot., the Balsam family, a nat. ord. of dicotyledonous plants, in the sub-class Thalamiform. There are but two genera, Imputions and Hydrocera (see these words), which include 110 species. These are scattered over the globe, but are chiefly natives of India, growing in damp shady places, and where the temperature is moderate. They are all herbaceous plants, with succulent stems containing much watery juice. The flowers are very irregular, ing much watery juice. The flowers are very irregular, and the petale often finely coloured. The fruit is irrecelled, and usually bursts with elastic force so as to scatter the seed over a considerable area. The plants are said to have diurctic properties, but they are never used in medicine.

BALSAMODENDRON, bal-sa-mo-den'-dron, in Pot., an important gen. of plants belonging to the nat. ord. Amgridacea. The species are natives of the East, and are remarkable for the odoriferous gum-resus which exude from their trunks. B. myrrha, a small tree growexide from their violes. In myrran, a sman tree growing in the north-matter parts of Africa, and in the adjoining parts of Arabia, is believed to be the principal, if not the only source of the fragrant gum-resin known in commerce under the name of myrra. This is called in Hebrew mor or mur, and is mentioned in the Old Testament for the first time in Gen. xxxvii. 25: hence is at first soft, oily, and of a yellowish-white colour; on exposure to the air, it soon acquires the consistence of butter, and in time begones much harder, and of butter, and in time begones much harder, and only see are hard externally, being coated with flint, ohonges to a reddish huc. Medicinally, myrrh is reasonable and are hollow, except at the nodes, where strong guarded as a tonic, stimulant, expectorant, and anti-

spasmedic, when taken internally: as an externa. application, it is sattingent and stimulant. It is an ingredient of the inceuse burnt in Roman Catholic chapels, and of some kinds of pastiles which are used for fumigation. The substance called bulm of Gilead, or balm of Mecca, and which is supposed to be the bala of the Old Testament, is said to be procured from B. gileadenie; some authors, however, name B. opobal-samum as its source. This substance was, in ancient kamum as its source. This substance was, in ancient times, regarded as a cure for almost every disease; but it is seldom used at the present day. The gum-resin, known as Indian Indellium, or fulse myrrh, and apposed to be identical with the bullium of Scripture, is probably the produce of two species of this genus; namely, B. mukul, and B. pubescens. It is the google or guggar of the Beloochees, and the mokul of the Perstans. It is very smillar to myrrh. African bullium, another of the gum-resins of commerce, is said to be an exudation of the species A. africanum.

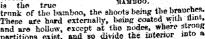
BALUSTER, bull-resider, in Arch., a term used to indi-

BALUSTER, ball-ns-ter, in Arch., a term used to indicate the little columns which are used to fill the openings in parapet-walls on the tops of houses, or openings in parapet-walls on the tops of houses, or which, when surmounted by a rail, form a balustrade to any long passage or gallery open on one side, and thus partially inclosed, for the sake of ornament or protection. The upright rails of a staircase supporting the hand-rail are called balusters, and sometimes ballisters or bannisters. The word is of doubtful origin. Nicholson, in his Architectural Dictionary, derives it from balustrium, a railed inclosure in the old Roman baths; others derive it from bulanstrion, the Greek for the flower of the wild pomegranate; while the deriva-tion adopted in the English Cyclopadia is the Latin balista, an engine of war used for hurling large stones ballsid, an engine of war used for maning angle and and beams, which was placed in a space railed in, called the balistarium; and hence the rails inclosing stairs, communion-tables in churches, terraces, &c., came to be called balusters. The ornamental form of the baluster is that of a dwarf column, with plinth and abnous, ornamented with bands and a swelling projection near the lower end.

BALUSTRADE, bel'-us-traid (Sp. belaustrade), a row of balusters surmounted by a cornice or hand-rail, used to give a finished appearance to the tops of large buildings of some architectural pretension; or for the inclosure of stairs, balconies, parapets of bridges, &c. (See Balustrae.) The balustrade in the Villa Conti, ut Pruscati, is nearly 700 yards long. Good examples of the architectural balustrade may be seen at the Villa Albani (Rome), Whitchall, and St. Paul's Cathedral.

Bamboo. (See Bambusi.) Bambusa, bām-bu'-sā, in Bot., the Bamboo, agen. of plants belonging to the nat. ord. Graminacea, the Grass family. The species are numerous, and are found in the tropical and sub-tropical regions of both eastern

western and bemispheres. They are graceful and noble - looking for plants: though they are merely grasses, according to the botanical meaning of the term, their jointed stems sometimes reach the height of from 20 to 100 feet. The stems in each species arise from a strong-jointed subterranean creeping root-stock, which which





HAMBOO.

### Bampton Lectures

number of closed-up cylinders. The cavities thus formed are usually filled up with soft loose pith, which may be easily withdrawn from any outting. A pseuliar finity secretion, called \*\*abasker\* (which set), is found in the joints of some species. The stems of different species of hamboo are applied to such a multitude of useful purposes, that a large volume might be devoted to a complete account of them. Good paper is made from them in China and other parts of the world. The from them in China and other parts of the world. The very young shoots are boiled and eaten like asparagus, very young shoots are posted and caren nice asparagus, and are size used for pickles and sweetments. As for the hollow stems, they may be said to be used as materials for houses, furniture, clothing, musical instruents, colar, and weapons, in all the countries where they flourish. Dr. Hooker says that in some districts are the state of the said for water, buckets. a very large kind of bamboo is used for water-buckets, another kind for quivers, a third for flutes, a fourth for another and for quivers, a third for the ske twork, a sixth for arrows, and so on. In China we find the bamboo used for water-pipes and fishing-rods, and for making hats, shields, umbreilas, soles of shoes, baskets, ropes, paper, scaffold-poles, trellis-work, sails, covers of boats and

BAMPTON LECTURES, THE. bömp'-ton, are name after their founder, the Rev. John Bampton, cannon of Salisbury, who left certain estates to the university of Oxford, for the endowment of eight divinity lecture-Oxford, for the emowment of eigh divinity, tetutresermons, to be preached annually at St. Mary's, Oxford, and afterwards published at the expense of the
foundation. The preacher must be at least a M.A. of
Oxford or Cambridge, and the same person can never
preach them twice. The lectures are to be on one of preach them twice. The lectures are to be on one of the following subjects:—to confirm and establish the Christian faith, and to confute all heretics and schismatics; upon the divine authority of the Holy Scriptures; upon the authority of the writings of the primitive fathers; as to the faith and practice of the primi-tive church; upon the divinity of Jesus Christ; upon the divinity of the Holy Ghost; upon the articles of the Christian faith as comprehended in the Apostles' and Nicence creeds. The first course was delivered in 1780; and among the more distinguished persons who have held this office are Mant, Heber, Whately, Milman, Hampden, and Mansel.

Ban, him, is a word which occurs in various senses in wars of the modern lummings of Furnity.

many of the modern languages of Europe. Its primary signification, however, and that which runs through all signmention, nowever, and that when rouse through all the others, is that of proclamation or publication; as in banus. (See Banus of Marriage.) It is used both as a substantive and verb by the early English writers, in the sense of cursing or denouncing woo and mischief against an offender. When a grant of land was made against an offender. When a grant of land was made for a religious purpose, the transaction was proclaimed with certain ceremonies, and curses were denounced against any one who should hereafter violate the deed. Persons who escaped from justice, or who opposed themselves to the sentence of the Church, were also sometimes banned. In Germany, persons or cities comessives to the sentence of the Church, were also sometimes banned. In Germany, persons or cities who opposed themselves to the general voice of the confederation were, by some public act, placed under the ban of the empire. In France, in feudal times, the barons who held of the king, when summand the band when it is the contract was called the house to attend him in time of war, were called the ban, and the tenants of the secondary rank the arrière ban. In the Sclavonic tengues, but means lord, sud was the title given to some of the military chiefs who were over certain of the frontier provinces of Hungary; hence termed banats.

Baraha. (See Mush.)
Baraha Placetories, or Common Bench, or Common Plens. The judges of the three superior courts of common law sit in banc or besico, that is, on the bench, of their respective courts at Westminsten, during term-time, and for a short period after, for the purpose of deciding questions of law coming originally before them, or by way of reference or appeal from the decision of a single judge at mist print, and otherwise. (See Affeat.)

Band, dind (Sax. band, Du. bende), in Arch., a throad flat moulding projecting a little beyond the surface of the building or column to which it is applied. It is sometimes placed along the front, or completely count buildings, and serves to indicate the different pinded when the arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance of the transfer of the remissance of the transfer of the remissance of the substitute of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over it like a label. In the Arch. of the Remissance over the remissance over the remissance over the remissance of the like arch. The Remissance of the remissanc Placiforum, or Common Bench, or Common Pleas. The

# Banderole

floors; but it is principally used in the basements of large edifices. The band of a column is sometimes moulded in various forms, and is then called a shaft

mouled in various and proper from the first and state of the aregiment or hattalion, usually about twenty in number, and distinguished by a particular uniform. BARDAGS, bind'-dige (Fr.), in Surg., is a piece of linen, calico, or flamel, used for binding up a wounded limb, or to retain dressings upon wounds. Handages are of various kinds, according to the purpose they are intended to serve. The most common form are intended to serve. are intended to serve. The most common form is a long strip of stout calico, varying in breadth from two to six or eight inches.

Previous to its application it is wolled up; and hence it is commonly termed a roller. There are also the T bandage, so called from its resemblance to the letter T; the 18- or many-tailed T; the 18- or many-tailed bandage, composed of one longitudinal piece, with a number of transverse pieces, or tails, to fold over the injured part; the suspensory bandage, &c. Much frequently depends upon the proper use and application of a bandage. The great object is to give equal



great object is to give equal and uniform pressure and support to the part, and to adjust it so that it may not be displaced or deranged by any movement of the patient. Of late years, elastic bandages have been much used. Flannel handages are used where warmth as well as support is required. Bandaken, or Bandaken, beardotter, bit handaken, or Bandaken, or beardotter, in Mil., was a large leathern belt thrown over the right shoulder, and hanging down under the left arm.

right shoulder, and hanging down under the left arm. It was worn by the ancient musketcers, for sustaining their firearms and for the carriage of their musketcharges, which, in small tin or wooden cases, were hung, to the number of twelve, to each bandaleer.

Bandama, or Bardanna, bān-dān'-nā, a method of printing calico, in which white or coloured spots are produced on a dark ground. The process seems to have had its origin in India, where it was practised by the Hindoos from time immemorial. The mode emitted the Hindoos from time immemorial. The mode employed was that of binding up securely with thread those parts of the cloth which were required to remain white or yellow, and then exposing the whole to the action of the dve. Bandans handkerchiefs are now largely made in Europe, and have quits superseded in beauty and precision the Oriental patterns. The process by which they are made was invented by M. Koechlin, of Mühlhausen, in 1810. The usual method employed is as follows:—The pattern desired is cut out it we sheet of lead, which are placed at the ton and in two sheets of lead, which are placed at the top and bottom of a pile of handkerchiefs, mostly dyed with Turkey-red. Bleaching liquid is then forced, by means Turkey-red. Biseaching-iquid is then forced, by means of a powerful Bramah press, through the perforations in the top sheet of lead, through the pile of handkerchiefs, and out of the perforations in the lower sheet. The bleaching liquor in its course discharges the colour from the cloth and leaves the pattern. Bandama hand-in-like the pattern and the propulse at the pattern. kerchiefs are not so popular as they were at one time; but M. Kocchlin's process is valuable in many other

HANDED, bint-ded.—In Her., any charge, such as a wheatsheaf or bundle of arrows, is said to be banded when it is tied together with a band of a different colour from the charge itself. Thus a goiden wheatsheaf tied with a red band would be thus expressed in heardlife there.

# Bandlcoot

to receive names or inscriptions. In Mil., it means any little flag or pennon attached to a spear, and the fringed flag hanging from the straight trumpet used by cavalry, or sounded before the heralds when making any proclamation. It is sometimes written bandrol and bannerol.

Handicoot, bin-di-boot (Perameles), a marsupial animal, indigenous to Australia. In some respects it is analogous to the opossum and kangaroo; but its hinder legs, though much longer than the anterior ones, do not present so great an apparent disproportion as in the last mentioned animal. It is a nocturnal animal, and burrows for itself a dwelling in the soft earth, for which purpose its claws are well adapted. The flesh of the bandicoot is said to resemble that of the rabbit; but the food of the former is generally of a very dif-ferent nature, consisting chiefly of insects and grubs. Its gait consists of a series of hops, in which, like the

rabbit, it is said to use its fore feet.

Bandir, bân-dit (Ital. bandito, an outlaw, from bandire, to banish), literally signifies a banished or outlawed person; hence one who is at war with civilized society, a highway robber, a hired murderer. The banditti in Italy formerly formed among themselves a kind of guild, with very stringent laws, and carried on a constant warfare against civilized society. The strong measures which the papal government, in 1820, took against the banditti and their abettors broke up their against the banditi and their spectors broke up their invining-places, and rendered them in a measure homeless. In many parts of Italy, however, particularly about Naples, the banditti are peasants of the country, who, besides being engaged in agriculture, employ themselves in robbery and murder. Peter of Calabria, one of the most celebrated of their chiefs, in 1812 assumed the titles of "Emperor of the mountains, Trans of the convailed and King of the forests, Protector of the conscribed, and Mediator of the highways from Florence to Nagles." The government of Ferdinand I. was obliged to enter into treaties with this monarch. The banditti are quite distinct from common robbers, who are called matriventi. More recently the banditti, by being joined by adventurers of all kinds, had become so strong and troublesome, that the Austrian troops who occupied Naples had to send large bodies of men against them. In Sicily they are most numerous in the Val Demone, where they were formerly so powerful that the prince of Villafranca, for political and other reasons, declared himself their patron, and treated them with much confidence, which they never abused. The revolution of 1848-9 added greatly to their numbers and strength. In 1866 our countryman Mr. Mores was taken prisoner by a band of these rascals in Neapolitan territory. He was subjected to many hardships, and was with difficults and the subjected to many hardships, and was with difficulty released upon payment of the sum of £5,100.

BANDOLINE, OF FIXATURE, ban'-do-leen, a preparation sold by perfamers, and much used by ladies for stiffen-ing and fixing the hair. It is merely a thick mucilage, obtained either from Carrageen moss or gum-traga-canth, seented with cau de Cologue or other perfumed spirit. A very delicate bandoline may be prepared by soaking quince-seeds in cold water for a day or two,

and then straining the mucilage.

Bandone, ban-dor (Sp. bandurria), a stringed musical instrument, bearing a strong resemblance to a lute. It was invented by John Rose, in the fourth year of the reign of Queen Elizabeth.

BANE, bain (Sax. bona, a murderer), denotes poison, or any cause of destruction or overthrow; as, "My bane and antidote are both before me."

BANEBURE, bain'-ber-e, in Bot., a name given to a species of Actea, the root of which is sometimes used species of Actea, the root of which is sometimes used medicinally, on account of its antispusmodic, expectorant, and astringent properties. It is a perenuial herbaceous plant, from one to two feet high, with triternate lessves, the leaflets of which are deeply cut and serrated. The flowers are in racemes; the berries are black and poisonous. This plant (A. spicata) is also known by the name of Herb Christopher. It belows to the nat od Ranunculaces. longs to the nat. ord. Ranunculacea.

#### Banishment

is not of this world." In this discourse he descanted upon the true nature of that kingdom which Christ came to establish upon earth; that it was wholly in-tellectual and spiritual; that he had not delegated his tellectual and spiritual; that he had not delegated his power, like temporal lawgivers, to any vicegerents or deputies upon earth; and hence, that the Church did not, and could not, possess the slightest degree of authority under any commission, or pretended commission, derived from man; that the Church of England and all other national churches were merely civil or human institutions, established for the purpose of difficulty and conventualing the knowledge, and ballet of fusing and perpetuating the knowledge and belief of Christianity; and that the truths of Christianity did not differ in their nature from other truths, except by their superior weight and importance, and were to be inculcated in a manner analogous to other truths, only demanding, from their higher import, a proportionably greater degree of care, attention, and assiduity in the promulgation of them. The publication of this sermon immediately produced a great commotion in the Churchia it was condemned by a committee of Convocation, and the proceedings of Convocation were arrested by an order from government; Drs. Snape and Sherlock wrote confutations of it, for which these divines were removed from their office of chaplains to the king. With the king and the government on the one side, and the church party on the other, the controversy was carried on with great animosity for many years.

Banian, bai'-mi-an, a general name given in India to a

BANIAN, bai'-ni-an, a general name given in India to a merchant, more particularly to the great merchants of Western India, at Bombay, Surat, Cambay, &c., who carry on an extensive caravan trade with the interior of Asia, even to the borders of Russia and China. Mercantile establishments of Indian Banians are to be found in almost every important commercial city of Asia. The Banians form a particular caste in India, and are distinct from the Brahmins, Cuttery, and Wyse, the three other castes. The name Banian was at first given by Europeans to all the Hindoos, they being the class with which they had most frequent intercourse; and hence the term was used in contradisbeing the class with white they had not frequent in-tercourse; and hence the term was used in contradis-tinction to Mohammedan. The Banians are very strict in the observance of the fasts prescribed by their re-ligion, and in refusing to cat flesh.

Bantan Days, a cant term among sailors, denoting those days on which they have no meat served out to them, derived from the practice of the Banians, who never est flesh.

BANISHMENT, ban'-ish-ment (Sax. ban, a proclams. tion, afterwards a curse), is the expulsion, by the judg-ment of some court or other competent authority, from ment or some court or other competent authority, from any country or place, for some read or supposed offence, —it may be for life, or only for a limited period. The term is also applied to the fleeing from one's own country to avoid some punishment or danger, when it is usually called voluntary banishment. Banishment, as a mode of punishment, has been prevalent in most civilized countries, ancient as well as modern. Among the ancient Greeks, banishment was mostly voluntary, the removing from the country of one accused of an offence; and laws were laid down defining its limits, duration, and legal consequences. The Greek name for banishment was phuge; whence is our word fugitive. Phuge, in a general sense, denoted every kind of banishment; but in a more particular sense it was dis-tinguished from outracism, masning as those who were under phage (for life) lost their property by confis-cation, while the ostracised did not; the former, also, had no fixed place of abode, and no time of return assigned; the latter had. In fact, ostracism was not, properly, a punishment for an offence, but rather the banishment, for a time, of such as were supposed to be too powerful or to have too much influence in the state. "Democratical states," says Aristotle, "used to ostracise, and remove from the city for a definite time, those who appeared to be pre-eminent above their fellow-citizens, by reason of their wealth, the number of their friends, or any other means of in-fluence." Ostracism was for ten years; but at Syracuse, longs to the nat. ord. Manusculaces.

Banerer. (See Bannerr.)

Bangorian Controverses, băn-gor'-i-an, one of the most remarkable controversies that has arisen in the Church of England. It was occasioned by a sertiment preached by Houdley, bishop of Bangor, before mon preached by Houdley, bishop of Bangor, before didtio again 2 against und 3 deportatio. Relegatio was George I., March 31, 1717, of the text, "My kingdom the mildest form of banishment, by which the offender 193

#### Rank

was interdicted from living in Rome or any particular province, or was compelled to reside in some assigned place, either for a definite or an indefinite period; but the sentence did not involve loss of property or dissensing. The interdictio again at igns,—interdiction of fire and water, while it did not directly experiest the oulprit, or deprive him of citizenship, had the effect of incapacitating him from obtaining the means of existence in his own country, and thus indirectly compelled him to seek refuge in another. The third mode,—deportatio, was the accessed of all and are introduced under the was the severest of all, and was introduced under the emperors in place of the interdictio aque et ignis. By it, the criminal was deprived both of property and of the rights of citizenship, and not unfrequently he was conveyed to some remote island, where, loaded with fetters, he was conveyed to to hope for the rest. with fetters, he was compelled to labour for the rest of his life. During the first French revolution, banishment (doportation) was introduced, and was substituted for the guillotine; and towards the end of Robespierre's administration it became very general. It still forms part of the French code, where it is classed in the third degree of infamous punishments, and when for life, it gives rise to civil death. Previous to 1843, however, this mode of punishment had long been in abeyance, imprisonment being usually substituted; but since that time it has been much arrelated as means of retting time it has been much employed as a means of getting rid of political offenders. As a punishment for crimes, compulsory banishment was unknown to the ancient law of England, although voluntary exile, in order to escape other punishment, was sometimes permitted. It is said to have been first introduced as a criminal punishment in the 39th year of Elizabeth, when a statute was enacted decising that "such rogues as were dangerous to the inferior people should be banished the realm." But it was not till a much later period that this mode of punishment came into general use and obtained the sanction of the legislature. (See TRANSPORTATION.)

BANK, bank (deriv. uncertain) .- The term bank having several significations, renders it difficult to assign to it a common derivative. It has two principal distinct meanings, one in reference to commerce; the other to geography and rural economy, implying an elevation of the earth, either natural or artificial, and either below or above the surface of the water, in rivers as well as in the ocean. It is further a technical term in law; the judges of the supreme courts of law, when sitting in judgment collectively, are said to sit in bank, banque, or banco. It is also a military term, denoting an elevation of earth within the parapet of a fortification, generally between two and three feet high, or more, according to the height of the parapet, being about four feet and a half lower than the top of the parapet, three feet broad, ascended at intervals by paraget, three seet broad, ascended at intervals by steps, by which the garrison get up to fire on, or to observe the proceedings of, the besiegers. Junius derives the word from the Dutch bancke, which signifies to beat, to strike; as the waves perpetually strike against the shores of the sea, and the current of the truer present against its side. Shimas and believed. river presses against its sides. Skinner and Johnson was that it comes from the Ang. Sax. bane, tunulus; Wachter has bane, a hill, mound, heap, and any eminence or rising place. It is transferred, he adds, to all eminent or rising places for sitting or lying; as banks of oars were not on the same level in ancient ships, but seats raised above one another. It may thus be applied to the table or counter of merchants, traders, or money-changers, who, being the most eminent persons amongst those who formerly carried on their commercial transactions in the open market-places, would naturally assume a more clevated position than the common traders or chapmen. (See further on this subject under the word BANKRUPT.)

BANK AND BANKING .- In a commercial sense, bank is a receptacle for money, to be always ready at the will or direction of the depositor. Banking, doubtless, first took its rise in the lending of money at interest; but the origin of this practice is so remote, that it does not come within the range of authentic history. From the restrictions laid by Moses upon the Israelites with respect to lending money at interest, we are justified in inferring that

# Bank and Banking

very great extent, and that much general distress was occusioned thereby. In New Testament times, we have evidence that a system of depositing money with persons at interest existed; as, in the parable of the Taisnis, the idle servant is rebuiked for not putting the money to the exchangers, and then, says the master, "I should have received mine own with most of the excitant that the state of the money dealings of the ancient Jews. In the time of Demosthenes, bauking operations were carried not a great extent in Athena. They exchanged foreign moneys, received deposits at interest, and gave loans. The rate of interest charged on loans is said to have been usually as high as 36 per cent. The bankers were generally of low origin, such as freedmen and aliens; but they frequently rose to great weath and eminence. One Pasion, a manumitted slave, is frequently mentioned by Demosthenessand contemporary orators, and more than once was the state indebted to his liberality. He is said to have owned land to the value of 20 talents (£4,287) in deposits from his sustomers. He (£12,187) of his own out at interest, and to have had 11 talents (£2,681) in deposits from his customers. He was a man of undoubted integrity, and his friendships and connections extended through the whole of Greece. The Athenian bankers are supposed to have been the first that invented the system of discounts, that is, of Inst that invented the system of asscounts, that is, or retaining the profits at the time of making the advance. The first mention that occurs of banking at Rome is in the year 352 B.C., when, the plebeians being in great distress, the state appointed certain persons to lend out the public money upon security; and this system was adopted from time to time, for a limited period, in times of monetary distress, throughout the republican period. Besides these, there were three principal classes of bankers at Rome: the Negotiators, holent money upon interest to the inhabitants of the provinces, by which means they were enabled to realize a larger profit (the Lex Sempronia de fanore, 500, was aimed at this), as they were not limited there by any laws. The private bankers, Argentarii, with whom individuals opened accounts (sense rationes, tabulus accepti et expensi), and by whose intervention (in fore et de mense acriptural) money was paid. They attended in particular to the payments of Roman citizens living in the provinces, as they might become due at Rome.—(Cio. ad Quint. ii. 12.) The Menserii, who were the bankers of the republic (Lex Minucia, 537), and were created for the purpose of abating usury:—"Novi consules remotrem quoque rem"—"levare aggressi, solutionem alieni wris in publicam curam verterunt."—(Lio. vii. 21.) Underthe emperors, the two words Argentarii and Mensarii were used without distinction. Thus C. Octavius, the Inther, is called Argentarius (Suet. Ang. c. 3), and Mensarius aimed at this), as they were not limited there by any without distinction. Thus C. Octavins, the father, is called Argenturius (Suet. Aug. c. 3), and Mensurius (ibid. c. 4, fin.). There was also a class of moneylenders of an inferior description, called Nummularioti.
The Nummularii were also a sort of bankers or dealers in money, who combined with their dealings the business of assayers; for which purpose they were apness of assayers; for which purpose they were ap-pointed to estimate the goodness or value of money, as to its weight, fineness of netal, and intrinsic worth. The Argentarii introduced one of the greatest con-veniences in banking,—that of making payments by means of cheques or written orders, called prescrip-tiones or attributions. During the Middle Ages, when commerce was but little developed, there was little field for harding cognitions but the having when commerce was but little developed, there was little field for banking operations; but the business was first established in Europe by the Lombard Jews in Italy, A.D. 809, of whom some settled in Lombard Street, London, where many hankers still reside. It seems to have been revived at Florence during the early part of the twelfth century. From the success that attended the commercial enterprises of the Florentines, that give heaven the continued that the continued the commercial enterprises of the Florentines, that give heaven the continued the commercial enterprises of the Florentines. rentines, that city became the centre of the money transactions of every commercial country of Europe, and her merchants and bankers accumulated great wealth. At one time, Florence is said to have had 80 bankers; and we find that between 1430 and 1433, 76 bankers at Florence lent the state 4,885,000 gold it was at that time a common practice among the florins. The earliest public bank in modern Europe was nation from which the Israelites came out. After the testing of the Jews from captivity, we read that the practice of leading out money at usury prevailed to a in order to extricate itself, had recourse to a forced florins. The earliest public bank in modern Europe was that of Venice, founded in 1157, or, as some say, 1176. It originated in the financial difficulties of the state, which,

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loan from the citizens, promising them interest at the rate of four per cent. The stock was made transferable, and a body of commissioners, called the Camera degli Imprestiti, was appointed to manage the transfer of stock and the payment of interest. This is believed to be the earliest instance on record of the funding system, and the first example it any country of a permanent national debt. This Chamber of Loans, as originally instituted for the purpose of managing the public debt, could scarfely be called a bank; and it does not appear to have carried on anything like a banking business for several centuries. Venice being the centre of an enormous commerce, thing like a banking business for several centuries. Venice being the centre of an enormous commerce, foreign coins, usually in a very worn or clipped condition, were in oirculation, to the great inconvenience of merchants; and hence the state had recourse to the expedient of authorizing the Chamber of Loaps to expedient of authorizing the Chamber of Loags to receive coins of all sorts, and to pay for them in notes an amount corresponding to the real amount of bullion deposited. These notes promised to pay the bester on demand a definite quantity of bullion of the proper fineness. The bank, however, does not seem to have discounted bills on its own account. Its only advan-tage was to save the wear and tear of the coinage, and to insure a uniform standard in mercantile trupsactions. Its notes always bore a premium as compared to the current money of the city; and it continued to exist until the fall of the republic in 1797. About 1350, the Cloth-Merchants of Barcelona, then a wealthy body, added the business of banking to their other commer cial pursuits; and in 1401 a public bank was opened by the magistrates of the city, which Spanish writers claim as being the first real bank in the modern sense claim as being the first real bank in the modern sense of the term. It received deposits, for which the public property of the city was pledged, and discounted the bills of merchants; but it does not appear that it issued notes or used cheques. Almost at the same time with the Bank of Barcelona, that of St. George, at Genos, was instituted. It was planned in 1345, but was not fully estublished and in operation till 1407. Like the Bank of Venice, it originated in the exigencies of the state. The republic had become indebted in large sums to a number of the citizens, and at length the whole was consolidated into one capital stock, to be managed as a bank, under the direction of eight pro-table tors. chosen annually by the stock-holders. This tectors, chosen annually by the stock-holders. This bank was pillaged by the Austrians in 1746, and never recovered its former prosperity. The Bank of Amsterdam was established in 1609, like that of Venice, to remedy the inconvenience arising from the great quantity of clipped and worn foreign coin that was in circulation. It received coins of all sorts at their weight in oullion, and, after deducting a small per-centage for the expenses of coinage and general management, gave credit for the remainder. It was enacted that all bills of 600 guilders (£52. 10s.) and upwards,—afterwards reduced to 300,—should be paid in bank money. It reduced to 300,—should be paid in bank money. It professed to lend out no part of its deposits, and to possess bullion to the full amount of the credits given in its books; but, when the French took possession of Ansterdam, in 1796, it was discovered that the bank had bettered to the state of the state Amsterdam, in 1799, it was discovered that the bank had lent uearly a million sterling to the States of Holland and Friesland; and this caused its ruin. In 1814 a new bank was established, called the Bank of the Netherlands. The Bank of Hamburg was founded in 1619, upon the same principles as that of Amsterdam, and has continued to flourish. The Bank of Stockholm was founded in 1668, and is remarkable as being the first, according to Law and Hume, that invented banknotes in Europe (the Chinese having the credit of having been the first to invent bank-notes, in A.D. 807).

Bank of England .- Previous to the formation of the Bank of England, in 1694, the business of banking in London was carried on by the goldsmiths, who bor-rowed money from their customers at a certain rate of interest, and lent it to government and private in-dividuals at a higher rats. The Bank of England was of interest, and lent it to government and private in-dividuals at a higher rate. The Bank of England was projected by Mr. William Paterson, a Sected gentle-man, and obtained its charter of incorporation on 27th July, 1984, in consideration of £1,260,000 (the then amount of its capital) being lent to government, who were to pay interest for the same at the rate of 8 per-cents, with a further allowance of £5,000 a year-for management. The first charter was granted for allows were certain; and it has been from time to first

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renewed down to the present time. At each re some advantage was given by the Bank to the gover-ment, in the shape of an advance of money at a low r ment, in the shape of an advance of money at a dow rate of interest, or without any interest. In this way the debt due by the government to the Bank was increased in 1708 to £3,275,000, in 1738 to £9,100,000, in 1781 to £11,686,000, and in 1818 to £14,686,000. At the renewal of the company's charter, in 1833 (3 £ 4 Will, IV. 0 88), provision was made for repayment on the part of the government of one fourth part of the debt due to the Rank. This act directs that in future the Bank shall do. This act directs that in future the Bank shall deduct £120,000 a year from their charge, on account of the management of the public debt. At present the amount due by the public to the Bank is £11,015,000. In order to meet these several advances, the capital of the company had to be increased from time to time by new subscriptions. In 1708 it amounted to £4,402,243, in subscriptions. 1746 to £10,789,000, in 1782 to £11,643,400, and in 1818 to £14,563,000, which is its present amount. From its commencement, the Bank of England has enjoyed several important privileges. The chief of these was several important privileges. The chief of these was conferred upon it in 1708, by an act prohibiting any company of more than six partners from being estab-lished for the issue of notes payable on demand in England or Wales. This act was partially repealed in 1826, so as to admit of such companies being formed beyond sixty-five miles from London. The Bauk is expressly prohibited from engaging in any commercial undertakings, except such as are purely and legitimately connected with banking operations; such as the buying and selling of coin, bullion, or bills of exchange. By the original charter the Bank was allowed to issue notes or bills of credit to an amount not exceeding £1,200,000, the amount of its capital. At first, none of its note the amount of its capital. At first, none of its notes were below £20; but, in 1759, it began to issue notes for £10; and £5 notes were first issued in 1793. The act 7 & 8 Vict. c. 32, declares that from and after the alst of August, 1844, the issue department of the Bank of England shall be separated from the banking department. ment; that the issuing department may issue notes to the extent of £14,000,000, upon securities set spart for the extent of £13,000,000, upon securities see spart for that purpose, of which the debt of £11,015,100, due from the government to the Bank, shall form a part; that no amount of notes above £14,000,000 shall be issued, except against gold coin and bullion. From her first establishment down to 1797, the Bank of England had always been able to pay its notes regu-larly when presented; but in the early part of that year, in consequence of rumours of a French invasion, the demands upon the Bank for cash were so great, that on 26th February an order of council was issued, pro-hibiting the directors from paying their notes in cash until the sense of parliament was taken upon the subject. When the matter was brought before parliament, an act was passed continuing the restriction until six an act was passed continuing the restriction that six months after the signature of a definitive treaty of peace. A report, drawn up by a committee of the House of Commons, to examine into the affairs of the Bank, showed that she possessed a clear surplus, after meeting all demands, of not less than £15,513,690. This report, and the fact that Bank of England notes This report, and the fact that Bank of England notes became practically legal tender, restored confidence. In 1801-3, their issues are stated to have been so much increased, that the notes fell to a discount of from 8 to 10 per cent. In 1809-10, from the same cause, the discount rose from 13 to 16 per cent. The issues of country bank-notes were also much enlarged, and in 1814 the discount on Bank of England notes was as high as 25 per cent. In 1816, no fewer than 240 of the country banks stopped payment; and this, together with the declaration of peace, raised the value of the Bank of England note to nearly a pur with gold. In 1821, the directors resumed specie paywith gold. In 1821, the directors resumed specie payments. In the latter end of 1825, the demand upon the Bank for cash was so great, that the directors applied to government for an order in council restricting specie payments; but this the government refused to grant, and the pressure was at length got over. During man, and obtained its charter of incorporation on 27th the great commercial panies of 1847, 1837, and 1866, July, 1894, in consideration of \$1,200,000 (the then amount of its capital) being leat to government, who were to pay interest for the same at the rate of 8 per the directors, if necessary, to infringe the act of continuancement. The first charter was granted for an anagement. The first charter was granted for do; and on two of these occasions it was found eleven years certain; and the pressure was at length got over. During man, and the pressure was at length got over. During the grant, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During man, and the pressure was at length got over. During the great commercial panies of 1847, 1837, and 1866, the great commercial panies of 1847, 1837, and 1866, the great commercial panies of 1847, 1837, and 1866, the great commercial panies of 1847, 1837, and 1866, the great commercial panies of 1847, 1847, and 1866, the great commercial panies of 1847, 1847, and 1866, the great commercial panies of 1847, 1847, and 1846, the great commercial panies of 1847, 1847, and 1846, the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during the great commercial panies of 1847, 1847, and 1846, during th

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person is entitled to demand notes from the issning person is ensuled to demand notes from the issuing department in exchange for gold bullion, at the rate of £3 17s. 9d. per curses. Should any banker discontinue his issue of notes, the Bank of England may, upon application, be empowered, by an order of council, to increase her issue upon researches to the extent of twocrease her issue upon "scorrities to the extent of two-thirds of the issue thus withfarewn; but all the profit of this increased issue must go to the government. In 1857 permission was in this way granted to issue an additional sum of £475,000; so that the Bank can now issue notes to the extent of £14,475,000, against which sum she has securities set apart for that purpose; and besides this, she can issue to the amount of gold and silver she possesses in terms of the above-mentioned act. By this act a weekly statement of the affairs of the Bank is required to be published in the London Gazette. Bank of England notes are declared to be a legal tender in all cases except when tendered by the Bank herself. All the notes which are at any time in circulation from the issue department must either be in the banking department, or in the hands of the public. The amount in the banking department is called by the directors "the reserve;" the amount in the hands of the public, "the active circulation." It is by the amount of reserve that the directors profess to regulate their changes in the rate of interest. the reserve is low, they increase the rate of discount; when high, they raise it. The amount of reserve de-pends chiefly upon changes made in the issue circula-tion;—when the issue circulation is high, the reserve is high; and when low, the reserve is low. The Bank of is high; and when low, the reserve is low. The Bank of England receives deposits, but allows no interest upon them, nor does she permit any account to be overdrawn. them, nor does sae permit any account to be overlawn. The rates of discount vary considerably, according to the state of the money-market; but, generally speaking, they average from 2½ to 5½ per ceut. Within the last few years they have been as low as 2 and 2½, and, in November, 1857, they rose as high as 10 per cent. The Bank transacts the whole business of the government. ment, and has always on hand a large amount of the public deposits, amounting sometimes to several milions sterling, on which she pays no interest. She receives the public revenue, and pays the dividends upon the national debt, for which she receives a certain annual per-centage. The profit on the issue department is the interest of 3 per cent. paid by government upon the £14,000,000 for which she has notes in circulation uncovered by specie. From this has to be deducted the cost of maintaining the issue, estimated at £113,000, and the sum of £180,000, which is deducted from the sum allowed for the management of the national debt, on account of the exclusive privileges allowed to her, and the exemption from stamp duties, leaving a clear profit of about £127,000. The Bank has also a profit of 11d. per ounce upon her bullion transactions; she also per ounce upon her bunken transactions, she also derives large profits, like other banks, from her deposits, with which she makes investments in public and private securities. The Bank of England is a central bank of deposit for all the London banks that are members of the clearing-house. They have all deposits here, and settle their claims upon each other by transfers to or from their different accounts. (New CLEARING-HOUSE.) The following is a statement of the affairs of the Bank for the week ending September 21st, 1870, issued pursuant to act of parliament:—

certain of the larger towns of Language, in order to extend to the provinces the advantages of a secure circulation. At present, therefore, there are branches of the Bank at Manchester, Swansea, Birmingham, Liverpool, Bristol, Newcastle-on-Tyne, Hull, Ply-mouth, Portsmouth, Leicester, Leeds, and at the west end of London. The weekly statements published include the whole catablishment,—the branches as well as the head office. The newton of rock issued in as the head-office. The payment of notes issued in London can be demanded only at the London office; but those issued at the branch offices may be demanded either at the cilice where issued or at London. The management of the Bank is, in terms of the original management of the Bank is, in terms of the original charter, rested in a governor, deputy-governor, and twenty-four directors. The governor must hold at least £4,000, the deputy-governor £3,000, and each of the directors £2,000 of the capital stock of the company. They are selected from the mercantile classes of London, virtually by the other directors, who form what is called a "House List," containing the names of certain persons whom they recommend as directors; and this recommendation is always followed by the proprietors. Thirteen of the directors, of whom the governor or deputy-governor must be one, form a governor or deputy-governor must be one, form a court, which meets every Thursday for the transaction of business, and for receiving a report of the state of the Bank for the preceding week. The court half-yearly declares to the stockholders the dividend due on the capital and profits. The committee of the treasury is composed of those directors who have held the office of governor, together with the existing omes of governor, together with the existing governor and deputy-governor, and the director who is intended to be the next deputy-governor. This committee meets once a week, and at such other times as it may be called together specially by the governor. It was the rule that every director should take his turn for becoming governor; but recently it has been determined to piace in that office him whom the other directors shall, by ballot, think the best qualified. Four general courts are held every year, in the mouths of September, December, April, and July. The secretary is the official organ of the corporation, and to him all correspondence should be addressed. Private Banks and Joint-Stock Banks .- The restric-

tion in favour of the Bank of England confining the number of partners in other banks to six, acted very numerous private banks, with not more than six partnumerous private banks, with not more than six partners, sprung up in various parts of England, and in 1792 their number is supposed to have exceeded 550. Many of them were destroyed by the crisis of that year; but, subsequently to 1800, they began rapidly to increase. In 1809 they amounted to 762, and in 1814, there were no fewer than 940. In the difficulties which followed, 240 of these establishments stopped varment. Since the abolition of the restriction to places beyond sixtyfix miles from London. tion to places beyond sixty-five miles from London, many joint-stock banks have been established in different parts of England, some with very large bodies of proprietors. The Bank Act of 1844 contained various enactments regarding private banks, by which they are at present regulated. It enacts that no banker, except he were issuing notes on the 6th of May, 1844, was in future to issue notes in any part of the United Kingdom, and the issue of each bank was to be strictly limited to the average amount of notes which it had in initiated to the average amount of noise which that in circulation during a period of twelve weeks preceding 27th April, 1844. Every issuing banker has to trans-mit weekly to the Stamp-office an account of his notes in circulation on each day during the week preceding. Banking companies on the joint-stock principle, but with the liability of the shareholders limited to the amount of the shares, may now be established in terms of the Limited Liabilities Act (21 & 22 Vict. c. 91); otherwise, holders of stock in any English bank, except the Bank of England, are liable, not only for the amount of their shares, but for the whole debts of the company, whatever may be their amount. All notes Public deposits 6,282,405
Other deposits 18,256,234
See en-day and other bills ... 895,361

243,799,367

In 1326 the directors agreed to establish branches in 193

Gold and silver company, whatever may be their amount. All notes are made payable on demand, and, since 1826, no notes for less than £5 have been allowed to circulate. The number of private banking establishments in London is 54, in the country 243. Of these last, 153 are banks of issue, laring a fixed issue of £4,404,935; while their actual issue is about a milkon less. It being discovered, about 1833, that the restriction against the establish-

Thanks Tre pan construction					
Notes issued 235,919,420	Gornmt. debt £11,015,100 Othersecurities 3,984,900 Gold coin and bullion 20,919,420				
£35,919,420					

Year Danish

	eparimeni.	
Capital£14,553,000		17,615,542
	Gold and silver	12,849,375 851,081
Seven-day and other bills 895,361		

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ment of joint-stock banks in or near London had reference only to the issuing of notes, several joint-stock banks of deposit have been instituted since that stock banks of deposit have been instituted since that time. There are at present, in all, ninety-five joints stock banks of England and Wales, ten of Which are in London. Of those in the provinces, sixty-three are authorized to issue notes to the amount, "in all, of \$2,903,557. Besides: the Bank of England and its branches, there are, in all, in England and Wales, 392 banks and about \$40 branches. \*

Banks in Scatland.—The first banking establishment in Scotland was formed in 1695, under the name of the Governor and Company of the Bank of Scotland. The original capital was \$21,200,000 Scots, or £100,000 sterling, in shares of £1,000 Scots, or £53. 6s. 8d. ster-

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ling. At present its subscribed ospital is £1,500,000, of which £1,000,000 has been paid up. It began to establish branches in 1896, and to issue notes for £1 in 1704. In 1727 the Royal Bank of Scotland was established, with a capital of £151,000, which has been increased to £2,000,000, all of which is paid up. The British Linen Company was incorporated in 1746, for, as its name implies, the purpose of undertaking the manufacture of linen; but these views were speedily abandoned, and it became a banking company only. None of the other banking establishments in Scotland are chartered, with limited responsibility; and hence the partners are liable for the whole debts of the company. The following table gives the names and various particulars regarding the banks in Scotland:—

Instituted. NAME.	Paid-up Capital.	Dividend Rate per Cent.	Share Paid. Price.
1695   Bank of Scotland   1727   Royal Bank   1746   British Linen Company   1810   Commercial Bank   1825   National Bank of Scotland   Union Bank of Scotland   Aberdeer Town and County Bank   1836   North Scotland Banking Company   1838   City of Glasgow Bank   City of Glasgow Bank   1838   Caledonian Banking Company   1838   Caledonian Banking Com	2,000,000 1,000,000 1,000,000 1,000,000 1,000,000	12 8 13 14 14 11 10 10 10	£. £. s. d. 100 275 0 0 100 175 0 0 100 287 0 0 100 281 0 0 100 280 0 0 100 235 0 0 7 15 0 0 4 8 0 0 100 216 0 0 100 183 0 0 21 7 6

and an authorized circulation of £337,038, suspended payments; but neither the note-holders nor depositors sustained any loss, the shareholders, about 1,300 in number, some of them very wealthy, being liable for all the debts. Soon after, unother Scottsin establishment, the Edinburgh and Glasgow Bank, having another in the state of £132 557, but the individual conditions of £132 557, but the individual conditions of £132 557. authorized circulation of £136,657, had to wind up its affairs, with the entire loss of its capital; but in this case an arrangement was made by which its authorized circulation was handed over to the Clydesdale Bank; so that it was not lost to the country, as was the case with the authorized circulation of the Western Bank. In both cases the stoppage arose from gross reckless-uess in advancing moneys. The Scotch banks all issue notes as low as £1. The issue is regulated by act & £ 9 Vict. c. 38, by which the power of issuing notes is confined to those banks that issued notes during the year preceding May 1, 1845, and the authorized amount of each is the average amount of notes that it had in circulation during that year. While the English jointstock and private banks cannot by any means exceed their authorized circulation, the Scotch banks can do so to any extent, provided they have at the head-office gold and silver coin to the amount of the excess of than a quarter of that of the gold. All the banks, except the Bank of Scotland, the Royal Bank, and the British Linen Company, are required to send snutually, in the month of January, a list of the names of all their partners, and such list must be afterwards published in some newspaper circulating in the town or county in which the head-office or principal place of issue is situated. All the banks have numerous branches throughout the country; so that there is hardly a town or village in Scotland without several of them. The number of such branches is in all about 600. The Sootch banks all allow interest on deposits, and even an the balances of current accounts. In 1858 the total amount of deposits in the Scotch banks was estimated at not less than £50,000,000. Besides making advances in the way of discounts and loans, they advance money in the way of unsounce and avenue, they suvenee money on what are called cash accounts or cash oredits. By this means, a person granting a bond, with approved securities, becomes entitled to draw upon the bank to the extent of the sum stipulated, and he makes deposits at his convenience for she liquidation of the same. forms the third class of the division. Were the duties. These accounts are balanced yearly, like current of banks limited to the safe-custody of money, they

In 1857, the Western Bank, with capital of £1,500,000, accounts. These cash accounts are found to be very and an authorized circulation of £337,038, suspended advantageous to traders, by supplying an additional advantageous to traders, by supplying an additional capital, for the use of which they pay only in proportion to the amount of it which they employ. Cheques are not used to nearly the same extent in Scotland as in England, accounts being generally settled by bank-notes. A merchant usually draws at once from the bank as much as he thinks that he will require during the day, and pays in what balance he may have in th

the day, and pays in what balance he may have in the afternoon. In this way, cheques are much fewer, and they seldom extend to shillings and pence.

Trisk Banks.—In 1783 the National Bank of Ireland was established, with similar privileges to those enjoyed at that time by the Bank of England. Its capital is £3,000,000 Irish, or about £2,800,000 string, of which £2,630,769 sterling is lent to the government. The "rest" formula from the accumulated profits is £1,043,000. formed from the accumulated profits is £1,043,000. The authorized issue of the bank is £3,738,000. It allows nne authorized issue of the bank is 23,735,000. It allows no interest on deposits. The other issuing banks of Ireland are the Provincial Bank of Ireland (founded in 1825), the National Bank of Ireland, the Belfast Banking Company, the Ulster Banking Company, and the Northern Banking Company. The aggregate authorized issue of all these is £2,616,000. The authorized issue of all these is £2,616,000. The authorized issue of each bank is fixed by the act of 1845; and all instead that make the addication to research. issues beyond that must be made against a correspond-ing value of bullion. The Irish, as well as the Scotch banks, issue £1 notes; and the joint-stock banks all allow interest on deposits. There are non-issuing joint-stock banks and private banks in Ireland; and there are numerous branches extending over the country.

From what has been already said, it will be seen that the term Bank is applied to establishments of very different kinds. Banks are usually divided into three classes, as they are merely for the custody or issue of money, or for both. The first class, or the banks of deposit, are, strictly speaking, those early banks which received money or valuables for custody, and kept them in their coffers till called for; but now the term is generally applied to those establishments that receive generally applied to those establishments that receive money from their customers and lend it out to others at a higher rate of interest. Banks of issue are those that issue their own notes for circulation; but as all of these, in this country at least, likewise receive deposits, the term is generally applied to what forms the third class of the division. Were the duties

would still be of immense advantage to the public. Every one who has had the east of large sume of money knows the againty which attends their catody, and the risks to which they see stillected; and hence the value of a place of security in which to lodge them. This gave rise to the first formation of public banks. But, were the money merely to his idly in the coffers of the bank, it is evident that the depositor would not only not receive any interest upon it, but would have to pay for the trouble and expense of keeping it; while the money thus kept was so much withdrawn from the trading capital of the country. The advantages of combining a system of lending money with that of receiving it soon became apparent; and banks were established for the purpose of both receiving and lending money; the interests received on the sums being considered sufficient to cover all expense connected with its management, or the risk of losing it; and, indeed, as already seen, almost all banks pay interest upon their deposits. By this means, numerous small sums of money, which would have remained unproductive in the hands of individuals, are collected into large sums, in the hands of the bankers, who employ it in granting facilities to trade and commerce, and in this granting facilities to trade and commerce, and in this way increase the productive capital of the nation. way merease the productive capital of the manon. Thus a million of money, in place of lying useless in small sums in the hands of the owners, or in one large sum in the coffers of a bank, is lent out to increase the capital of manufacturers and traders; and thus the world is made one million richer, or at least is saved from being one million poorer. Besides the money from being one million poorer. Besides the money which a banker receives in deposits from his customers, he must be pessessed of a certain capital of his own in order to carry on business, and to insure confidence in his stability; for no one would lend money to a banker if he knew that he was possessed of no capital. The interest derived from this capital forms part of the profits of the banker; but it is evident that the profit in this case is not the same as that which he derives from trading with the capital of others; in other words, that the interest is not greater than if he had lent out his money in any other way equally safe, and involving the same arount of trouble. The capital of the banker the same argount of trouble. The capital of the banker ought properly to be invested in government securities yielding three per cent., which can readily be converted into money in the event of an unexpected demand upon him by his customers for their deposits. The deposits, over and above a certain sum which he must have at hand to meet daily claims, he advances in various ways as loans. The best and safest mode of employing such as loans. The best and saiest mode of employing such funds is considered to be in the discounting of good mercantile bills of exchange; that is, bills representing bond-fide transactions of trade and commerce. A banker sometimes makes advances upon the deposit of exchequer bills or other government securities, railway debentures, bills of lading, dock warrants, and such-like; but, except the government securities, the others are generally avoided by prudent bankers. Loans are usually divided into short loans and dead loans, the former bankers are the strong a fixed time for their repayment, the former having a fixed time for their repayment, the latter no fixed time. Loans of the latter class are generally avoided. Advances upon deeds, except in agricultural districts, are always objectionable. If depositors have the power of demanding the amount of their deposits at any time from the bunker, while he usually makes his advances for a fixed or definite period, it is evident that he must always have on hand, uninvested, a considerable sum to meet such claims. The amount a considerable sun to meet such claims. The amount necessary for this purpose may generally be pretty nearly estimated. It depends upon a number of circumstances; as the state of the money-market, the cumstances; as the state of the money-market, the amount and nature of the deposits, the average amount of daily payments, and such-like. Is banker is at liberty to issue bank-notes to a certain amount, it is to the interest upon the difference between the average amount in circulation and the amount of specie required to be kept on hand to meet them, less the expense of their manufacture. If, however, a banker were obliged to kep deadstock or bullion equal to the amount of his notes in circulation, he could make no profit. But for a banker in good credit it is considered that a fourth or a fifth part of this sum is usually sufficient. Besides creving as places for the safe-cuatody for money, and allowing interest on deposits, banks are of great use

in affording a safe and rapid transference of money from one place to another. A debtor in Edinburgh, or Dublin, pays to his banker there the sum which he wishes to possey to his oreditor in London. The banker, for a small commission, furnishes him with a draft or letter of credit for the amount, to be paid by a banker is London, from whom the creditor, on presenting the draft, seesives the smount. Thus, then scanser is London, from whom the creditor, on pre-senting the draft, receives the smount. Thus, then the disposable means of a bank are,—1. The amount of paid-up capital; 2, the amount of money lodged by oustomers; 3, the amount of receives in since land of the conon pand-up capital; we the amount of money logged by the amount of money in course of transmission, that is, money received for the purpose of being repaid is some distant place at a future time. These means are employed,—1. In discounting bills; 2. in advances of money in the form of cash credits, loans, or overdrawn accounts. 3 in the contract of the country of accounts; 3, in the purchase of government and other securities; 4, a part retained in till to meet gurrent demands. Of these four ways of employing capital, three are productive, and one, namely the last, unproductive. The profits are that portion of the total receipts of the bank, including discount, interest, dividends, and commissions, which exceeds the amount of the expenses. A greatsaving is also effected, by the use of notes and cheques, of wear tear, and upon the coinage of the country. Frequently the banker performs the duties of cash-keeper to his depositors, making all their money payments beyond their small daily expensively. diture, and receiving the money payable to them. The merchant, by sending all the bill-due to him to his banker, to be presented, and noted it not duly paid, is saved a great amount of trouble, and the risk of making mistakes in the presentation of the bills, the banker being always liable for any mistakes that may be com-mitted through him. But it is in the use that the banker makes of the money that is intrusted to him that he is of the chief benefit to society,—in his loans, discounts, and eash credits. It is here that he requires to exercise his greatest ability and skill, he requires to exercise his greatest shifty and skill, so that he may be the means of furthering the prosperity of the country, by aiding honest industry, and exposing regnes and reckless speculators. "From motives of private interest," says Gilbart, "they (the bankers) encourage the industrious, the prudent, the punctual, and the honest; while they discountenance the spendthrift and the gambler, the liar and the knave. They hold out indusements to uprovidings, which are They hold out inducements to uprightness, which are not disregarded by even the most abandoned. There is many a man who would be deterred from dishonesty by the frown of a banker, though he might care but by the frown of a banker, though he might care dutitle for the admonitions of a bishop."—Hef. English Cyclopædia—Arts and Sciences; McCulloch's Commercial Dictionary; Gilbsr's various works on Banking; Dunning McLeod's Theory and Practice of Banking, and Dictionary of Foitical Economy; Lawson's History of Banking; Smith's Wealth of Nations.

BANK-NOTE MANUFACTURE.—In order to prevent the forgery of bank-notes, a great deal of ingenuity and art has been expended on their production. The principal features of the manufacture are,—a peculiar kind of paper and water-mark; an elaborate design, printed with a peculiar kind of ink, and certain private marks, known only by the bank officials. Until 1837, marks, known only by the bank officials. Until 1837, bank-notes were produced by copper-plate printing; after which time, by means of Messrs. Perkins & Heath's invention, they were reproduced without fresh engraving. They employed the following method:— The note was first engraved on a soft steel plate, which was afterwards hardened. The impression was then transferred to a soft steel roller, which, in its turn, was stanserred to soil seer roller, which, in he darm, was also hardened, and the impression remained there, in relief. From this roller any number of freshly-engraved plates could be produced. In 1855 Mr. Smee, the surgeon to the Bank of England, introduced the

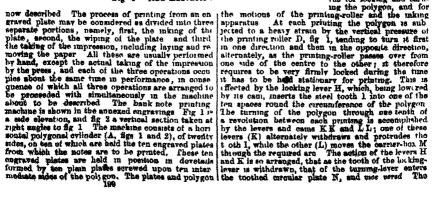
#### Bank-Note Printing

engraved plates, as forming a butter prote fraudulent imitation; but the slowness an increased expense of this manner of prim dion se pared with ardinary type in some instances, to the liner some instances, to the finite and better protective pro-cess. Improvements of a timer churacter hape been made from time to time in the process used from practing from suggested pulses; and the note printing press of the late Mr. John Oldham, leng in use in the Bank of Ireland, and subsequently in the Bank of England, may be mentioned as, perhaps, the best example. But any attempts to abridge the labour and tune of the operation by inking the sugraved plates by means of machinery, appear to have failed entirely greated to Mr. Grubb's machine, which is

### Bank-Note Printing

by states, successed and the localizary rate or working, such impression occupies her neconits, and the polygon is held stationary during eight securit of the time, and during the remaining time secondary is bursed round, through one-touth of a mechanica, in the direction shown by the strew is ig. 1, so as to brung the east engraved plate to the top for being printed from Dungs the sight seconds that the polygon is stationary, the undermost plate at C is faked by the machine, the uppermost plate at C is faked by the machine, the uppermost plate at C is faked by the plate at F has the wiping of its surface completed. The machine requires two attendants, one standing in the box F, who lays the paper, removes it alter being printed, and observes that the work is proceeding satisfactorily, while the other gives the final wiping by hand to the surface of satisfactorily.

final wrping by manu to surface of saids plate as as toomes not the position R, fig. I The greater-portion of the superfluors ink is wiped off by the machine, thereby intenting the labour of the final winng the labour of the final winner the labour of the labour of the labour of the final winner the labour of the bour of the final wigning by hand thus is duse by means of the wiping-volue. G. on which is wound a length of cotten dicht. This wiping-relies is sta-tionary while the edygon is at rat; but on the poly-ce heartman to move is at rea; but on the pur-gon beginning to move, the roller presses symmet the surface of the pre-viously-inted riste, and, by turning in the appoints direction, whose off the superfluous ink. When the surface of this roller be-comes surcharged with ink, a length of the cotton cloth upon it, equal to one round, is torn of. By the revolution of the polygon, therefore, each plate on arriving at the notion (at C) is mked, and as it pro-ceeds upwards is first partrally waped by the machine at G, and afterwards final y wiped by hand at E; and, on arriving at the top, is printed from - by the printing-roller D Several printing-roller is reversal special contrivations are required for producing the respective actions of the machine, the principal of which are the apparatus for looking and turn-



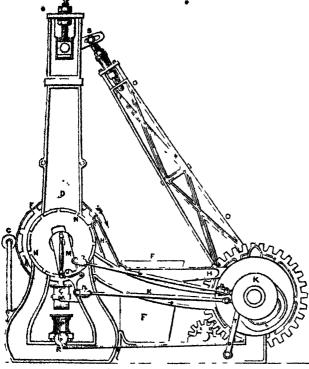
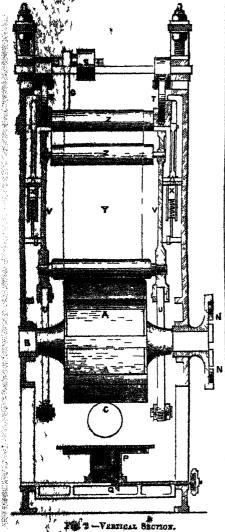


Fig 1 -Side ELEVACION

now described The process of printing from an en



The roller is first caused to at the proper time, and with a suf ages the plate on which the paper to divisions it and, nert, the roller is carried at the surface of the plate, to produce the plate, to produce the plate, to the first position. The motion of the roller is therefore as shown by FRH in Rg. 8, Plate XVII; snd this plated is the following manner:—The

propting roller sets of cams The blocks W, sectors V roll, slide vertically in frames with the machine the blocks is faced with a flat surface of against which rolls the upper segments sectors, which is also made of harden steel hearing suriaces are retained in schools, spiral springs X, fig 2, which carry the weights sectors, the printing roller, and the leaves V, sectors are prevented from shipping in rolling at the blocks W by means of bridle leaves, which of motion in other directions, but prevent ping. An endless sheet of fishined (Y) passess the printing roller D and over the guide-tall above, travelling in the direction shown by the sin fig 3 the inper rollers Z are carried by the tors V and alide blocks W. The suking of the englets is performed by the inking-teller D, and 2. Upon the capability of the machine to temperated plates effectively depends its useful and herein ley the main difficulty, and the reason failure of previous attempts at improvement that, in using the mk applicable to engraved. steel bearing surfaces are retained in that, in using the ink applicable to engraved a portion of it becomes thickened and me immediate use In the ordinary band-apids thickened ink collects in a ring on that part dabber which barely comes into contact with dabber which herely comes into contact with the during the inking; and this requires to be with occasionally from the dabber ty a kinds or serie otherwise, by its mixing with the fresher int, quality of the work would be injured. In experime made preliminary to constructing the present made a cylindrical roller was used for inking the place. hand, and was supplied with ink from a performed surface through which the ink was caused to break and it was found that the thekened mk, technically termed "gatherings," advered at first to the perfo-rated surface between the perforations, and after-wards, when the film tad arrived at a certain thickness, it was transferred bodily to the surface of the inline roller A hear experiments led to the adoption of roller differs experiments led to the adoption of a following inking apparatus. The short evinader figs 1 and 2, containing the supply of tak, is fifth with a justin, the red of which is a screw that my idea is to show the evinider expands into a horizont rectangular tray, rather larger in size than the pia to be mixed, and this tray is covered with a flat pia of steal perfected with a number of steal preferred with a number of steel perforated with a number of small hole.

The piston is slowly raised by the screwed piston of and the bevel wheels Q and ratchet-wheel E. In ord to charge the cylinder with ink, the piaton is low and the perforated top plate removed for filling ink and, on replacing the top the pisten is re until the ink exudes through the performance. until the ink crudes through the perforable top plate, the lowering and raising of the gift effected by hand by a winch upon the spine ratchet wheel R. The supply of ink durings of the machine is kept up by the least C cam shaft (fig. 1) acting on the ratchet-wind in the unificient quantity of ink being in forced up through the perforated strategy plate inked by the inking-regiler C. This high control of the control of the property of a number of diese of worden sides, see the thirty together upon a spindle, and the shift open as princile. of a number of unos of records, taghily together upon a spindle, said lathe. It is worked to and fro pass intermission by the rack and sector sides on a cylindrical rod (D), which F, carrying the roller, to be raise. Fr. carrying the roller, to be raise sufficiently for causing the inlanguable ink to the engraved place on the pand above in figs. 4 and 5, or to a

上一次上的 在我们的一种人们有关的是是一种人的人的人的人的人的人的人的人的人们是是是一种人的人们的人们是一个人们的人们是一个人们的人们的人们是一个人们的人们的人们们是一个人们的人们们的人们们们们们们们们

on the inking time takes up a fresh supply on is turned through one-tenth of to bring the next engraved plate ready to be inked when the mking main by the lever G. As the mk is the perforated inking table P to the in a series of dots through the holes ie, the engraved places would be inked in one management, one engraved plates would be inked in a simplifit, and therefore imperfect, manner, but this is prevented by the application of the two small distributing collers I I, which are pressed in contact with the intragradiers imply revolves in contact with the intragradiers imply revolves in contact with the intragradiers imply revolves in contact with the intragradiers, but the other has on one of its bearings a major, which even it is need. summary rower, Dut the other has on one of its bearings a samen, which gives it an end-traversing motion, in addition to the rotary motion, and thus the ink conning to the solder in dots, is equalized over its entire surface, and the inking of the engraved plates is rendered subtrouch all over. The occasional seconds of the Hos. and the mining of one engraves places as consequently addressed ink from the surface of the inking table P is provided for by the arrangement shown in fig 7, Plats XVIII. The ink-soraper J is shown in the position where part of notion, and H is the lever, and M the eting-rod for communicating the required motion to it from the cam N On the scraper beginning to \$6 if from the cam N On the acraper beginning to neave across the inking-table P, from the position shows at J in the drawing, a small cam at each end outside it to rise, and so to pass clear over the abd without acraping, while in the return motion the acraper descends into contact with the table, and pushes before it the thickened ink, which falls into a trough prepared to receive it It the coraping were to be performed once for every impression printed, these it would only be required to allow the cam roller at the end of the level H to remain continually in the groove of the card N But as it is required that the strument should be performed only occasionally, or consider every thirty an impressions or revolutions of the cameakst, the following arrangement is adopted the came that, the following arrangement is adopted At O is a latch, which, so long as it is not raised, holds the connecting for M, pushed outwards laterally, so that the cam roller is out of the cam groose N. The raichet-wheel Q has severity two teeth, and as carried forward, one tooth for every impression, by the paul R, which is actuated by the cam shown by the dotted line. Attached to the ratchet-wheel is a directly large only two notches (TT) in its circumference, and U is a rocking-frame, locking on a pun at its lower end, and having on the upper part a precting finger which is caused by the weight W to press continually against the edge of the disc S. V is a bolt worked up and down at each revolution of the cam shaft by the same lever and cam that works the paul R of the ratchest-wheel. The upper end of this bolt shdes in the raisking-frame U, and so long as the finger is on rateint-wheel The upper end of this boil since in the resking-frame U, and so long as the finger is on the adge of the disc S, the boit V rises and falls just clear of the latch P, as shown in the drawing, so that it produces no action. But once for every thirty six impressions of the mechine, the finger of the rocking frame U enters one of the notches (1) in the diss, and rapressions of the mathine, the finger of the rocking frame I eakers one of the notches (1) in the disc, and the rocking-frame falling forwards, titls the bolt V into the position indices of by the dotted line, when the next rising of the bolt hits the latch O, as shown by the detailed line. The cam roller is now thrown into the camproner N by the lateral pressure of the siving lever M, and the scraping of the inking-table P is perfumed once by the revolution of the cam. At the end of the seventy is the camping of the seventy of the inclined stop X at the end of the swanginger N by the inclined stop X at the end of the swanginger N by the inclined stop X at the end of the swanginger N in intantly held out by the dropping of the latch B; and before the bolt V again races, the race of the noteh T, and therefore the bolt V rass sleep of the noteh T, and therefore the bolt V rass sleep at the finger of the rocking-frame U is again to the fine noteh T, and therefore the bolt V rass sleep at the latch O, and cases to life it for the next third-six impression. If T. Thomas Grabb that it is planning, and also in the construction of the engineer planning, and also in the construction of the engineer machine, he has derived much OCCUPI

by expensive mechanical alterations of the being done and efficiently; and this system spectron, the data for the requi everal cams, and for keeping t their shafts in the exact positions i recourse to tentative trails. When the interest occasion to bring this machine under the m Institution of Mechanical Engineers at Ethe president of the sourcey, Sir Joseph a spoke of it as being beautifully contain purpose for which it was designed. He immelf as much struck with the simplicity struction and the sourcey of its working, attack that two of the machines above delicated that two of the machines above delicated. been in constant use at the Bank of Ireland fourteen years with starcely any repairs.

Bank-Nors Engraving —We have now

HAME-FORE ENGLAVING — We are new to the manner in which the plates are engraves separate subjects or designs forming the thank-note are engraved by hand, in the first bank-note are engraved by hand, in the first hardened, and are preserved as the permuse terms, not to be printed from The engrave them transferred in relief to the surface of a contract of the surface of the surfac rollers, by rolling these over the pattern blood a heavy pressure, and these rollers are sale hardened so as to be used as dies to unpress narcened so as to be used as dies to impress in graving upon the printing-plates in a similar tea to that long employed for engraving the ex-conductor used in calico printing, but requising greater amount of accuracy in the present insti-llate engraved plates for printing the bank-more made of soft steel, and are never handlessed being engraved, because, being of large size-30 long by 6 inches wide,—they would almost en not retain their flatness in hardening. Most not retain their flatness in hardening. Miniscrep, when worn in printing, the soft plates are easily repaired again by means of a special arrangement that the inventor has designed for the purpose, which enables the roller to be applied again to the plates with perfect accuracy for renewing the impression. In first impressing the plate with the master roller, or die, the plate is fixed upon the table of a strong pressing machine capable of exerting a pressure up to five tons, regulated as required by means of a weighted lever, and the position of the results of the results of the second of the property of the second of the position of the pression of the position of the pressure of the second of the position of the pressure tons, regulated as required by means of a weighted lever, and the position of two register-points in this plate being accurately noted by means of a milero-moter microscope, are registered in a best kept for the purpose, the master roller is then passed over that plate by the muchine under the heavy pressure, being very steadily guided by a special parallel-mixtum ar-rangement with pressure sectors similar in principle to those of the note princip machine aircant disrangement with pressing sectors similar in principles to those of the note principle accepted. The table is provided with complete adjustments of very great delicacy, and the pressure of the engaving-roller upon the plate is not produced by the roller descending upon the plate, but by the table being raised up to the roller. The table being if considerable weight, is belianced, so that it is moved vertically with a force of a few pounds; and it is proved the produced by the transport learn arms of the produced of the transport learn arms of the produced of the pounds; and the produced of the produce successive weight, in consument, so these is a provided with two separate lever-acrangements—one for light, and the other for heavy pressure which they pressure, from a few pounds up to the first home, can be put upon the plate. For renewing the impression upon any subsequent coorsion, the plate is again fixed to the table, in exactly the same position as befure, by means of the micrometer nucroscope and the register of its position, and the roller is these peaked over it again to deepen those parts of the impression which have become worn up printing.

BANKEUPT, bank-raps (Fr bang-servicines, bangiarouts) Ital banco rotto)—The table of the first linghab scattle relative to bankrupta,—the 34 Han, VIII, a. 4, which is said to be against "such persons as do make hank-raps," in a lateral translation of the Franch upon any surface from bangua and rouse, i.e. waters any some form bangua and rouse, i.e. waters and translation of the Franch upon. Thus a mark-annel is the sign where the reak or sign. Thus a mark-annel is the sign where the

Banneret

cart-wheel has gone; and benings is metaphorically of a table once taken from the sign left in the s fastened to it and telem swar. m is the earth, of a table once though The original seems to Romen backers or money-di, who had their tabernas and changers, called Messaget, who had their fabricas and messad, their booths and tables,—in certain public places (see in Relysiand Spain, they now have, or lately had, their openly in the market-places); and, when they fathed sad find, they left only the signs of their banks, henches, or tables, behind them. The use of they famed san buck, say, behind them. The use of banks, benches, or tables, behind them. The use of tables by signey-changers also prevailed in the time of our fameur. (See Matt. xr. 12.) Others derive the word from the Italian bunce rotto, broken bench; it being the custom in Italy, when a banker failed, to break his person to whom the bank belonged was no longer in a condition to continue his business. The land of Elizabeth was the second English statute, all ionger in a condition to continue his business. The Sind of Elisabeth was the second English statute, all the provisions of which were incorporated in 1 James I., which was for a considerable period the leading act re-lating to participate. According to these statutes, a bankrupt was considered a criminal or offender. In 1731 an act was passed, by which a bankrupt who secreted his property or books was made punishable by death: and John Perrot was, under this law, hanged in 1761. At the present time the laws of bankruptcy are calculated to operate for the general benefit of trade, but nevertheless they impose penalties on fraudulent or dishouest persons. Before "the Bankruptcy Act, 1861," only certain traders could become or be made bankrupts; and relief to persons in difficulties or in confinement, and not sub-ject to the law of bankruptcy, could only be obtained under the provisions of various acts of parliament passed from time to time for the relief of insolvent debtors. But by this statute, sec. 69, all debtors, whether fraders or not, are subject to its provisions; but a non-trader cannot be adjudicated bankrupt, unless, with intent to defeat or defraud his creditors, he shall rt the realm, or, being out of the realm, with such est remain abroad; or with such intent make any fraudient conveyance, gift, delivery, or transfer of his real or personal estate; or unless he commit the other agts of bankruptcy after-mentioned; and, by the same statute, it is enacted that the following shall be considered acts of bankruptey:—a trader lying in per considered acts or burning or a trader for two calendar months, or, in either case, escaping out of prison; a debtor, whether a trader or not, filing a declaration that he is unable to meet his engagements; decination that he is unable to meet als engagements; trader debtor suffering an execution to be levied; any debtor, on being summoned in respect of a debt amounting to £50, and not paying the debt and costs, or scarring or compounding for the same to the satisfied of the creditor. And any debtor may petition for adjudication of bankruptey against himself. In cases where persons are imprisoned for debt, a registrar is to attend at the gaol, and examine the prisoner, and, after the expiration of fourteen days, or two calendar months, as the case may be, and as before mentioned, he may make an order of adjudication, grant him protection, and order his release. If the prisoner retime to conform, or to sign his examination, the court may commit him to the common good of the county, there to be kept, with or without hard labour, for any time not exceeding one month. The object of the statute is to administer the whole of the bunkrupt's estate for the benealt of his creditors, to discharge him from insprisonment and further liability, on his fairly and housely fiving up his estate, and making a full disclosure of his allure. But, on the other hund, it heclares the bankrupt shall be guilty of a misde-nession, and be hable, at the discretion of the court refore which he shall be convicted, to imprisonment netone which he shall be convicted, to imprisonment for not mines than three years, or to any greater punishment attached to the offence by any greater punishment attached to the offence by any gristing statuta, for either of the following offences:—If he shall neglect to surender or be examined, or refuse to or not fully discover his property and the mode of its dispuss; or, after adjudication, or within sixty days prior thereto, with intent to defraud his creditors, remove, orangest, or subsessie any part of his property and the state of side or newerfas; or not disclose, within remote, consest, or emiserate any part of his property to the sales of \$10 or upwards, or not disclose, with one manish after. his knowledge or belief that a faise data ass facin proved under his bankruptey; or wil-felly or frami remaily omit from his schedule any effects 202

sel or withhold the production of paper, or writing of a or affairs; or, after o distinction, account any b property, designed, or efficient of after or within three months, before adjudication, concean, destroy, siler, mutilate, or falsify, any book, paper, withing, security, or document relating to the setate, destings, as efficient, or make, or be privy to the making, of any false or fraudulent entry in or omission from, any most, paper, document, or writing relating theretay on, within the like time, knowing that he is unable to most his encountering fraudulently and with injury to district. gagements, fraudulently, and with intent to diminish the sum to be divided amongst the general budy of his creditors, have made away with, margaged, encom-bered, or charged any part of his property; or if, siter adjudination, he shall conceal any debt due to ar from him. Similar penalties attach to a trade of the fal-lowing cases:—If he shall, under his baskrugter, or at any meeting of his creditors within three months next preceding the fling of the petition for adjudication, have attempted to account for any of his pro-perty by fictitious losses or expenses; or if, within the like time, under the false colour and pretence of carrying on business, and dealing in the ordinary course of trade, have obtained on credit from any person, or trace, have obtained on credit from any period, any goods or chattels, with intent to defraud; or, with intent to defraud his creditors, within the like time, pawn, pledge, or dispose of, or otherwise than by bond-fide transactions in the ordinary way of his trade, bond-fide transactions in the ordinary way or any example, any of his goods or chattels which have been abtained on credit and remain unpaid for. Although the attaite contains 232 sections, the former laws applicable to bankrupt traders remain in force, except where they are altered by the law now under notice. The whole of the bankrupt's effects pass to his assignees, and he is bound to assist them by making such disclosures as will enable them to divide the same amongst his creditors. In a work of this nature we cannot enter more fully into the law of bankruptcy; nor should we have treated of it at such length, except for the radical change effected by the late statute. (See Assignment of A BANKRUPT. BANKS, SAVINGS. (See SAVINGS BANKS.)

BANKSIA, bank'-si-a, in Bot., a gen; of plants belong-ing to the nat. ord. Proteucew, and so named in honour of Sir Joseph Banks. The species are bushes and small trees, found in all parts of Australia. They have hard dry leaves, dull green above and almost white beneath. The branches bear, towards their extremities, long heads of very numerous flowers. The flowers scorete much honey; hence the name honeysuckle-trees commonly given to these plants by the colonists. Several species are much sultivated in British conservatories.

BANNATYNE CLUB, bin'-à-tine, a literary chub in-stituted at Edinburgh, in 1823, by Sir Walter Scott, who was its first president. It takes its name from Who was its first presument. It takes its mainter aroun George Bannatyne (1545—1607), compiler of the cele-brated MS. in the Advocates' library, entitled, Corpus Precision Scotorum. It consisted originally of only 31 members; but as many persons of rank and literary distinction were auxious to join it, the namber, in 1823, was increased to 100. Its object is the printing of rare works illustrative of the history and antiquities of Scotland, for distribution among the members, each of whom pays an annual subscription of five guiness Since its commencement, it has published upwards of 100 quarto volumes of rare and interesting works.

100 quarto volumes of rare and interesting works.

Bannes, bān'ner, is a piece of cloth stached to
the upper end of a pole or staff, and mustly bearing
some device or emblem. Banners or standards have
been in use from the earliest times. We find them
mentioned in Numbers ii., where the children of issued
are disected every man to "pitch by his own standard
with the ensign of their father's house." The earliest with the ensign of their father's house." The sarliest standards were probably not banners, but representa-tions of some animal or other object fixed un the top of a pole, as the Roman eagle or the Attentan owl. The chief use of the standard or banner in all times The chief use of the standard or beamer in all times must have been to serve as a rallying-point to soldiers in battle. Hence they have always been regarded as an emblem of national bonour, which the warrior was ever ready to defend at the risk of the life; and bence, banners taken from an enemy have always been regarded as special trophics of victory.

Bannauer, ban-ner-et, was the title of a knight who was entitled to been a beamer in the field, or who

Bannock

Baptistery

was able to bring into the field a sufficient body of men to have their own leader. The hanceret was created on the field of busile, on account of distinguished ser-vices. He took precedence of all other knights after barons. The dignity has not been conferred for a long

barons. The dignity has not been conferred or a long time. Its origin is of uncertain date; but it was pro-bably created by Edward I.

Blass or Markians, dans, the public proclama-tion of the names and designations of persons about to be married, made in church; the object being that those who have objections to the marriage may have an opportunity of stating them. According to the law of England, the proclamation must be made on three successive Sundays in the church during the time of successive Sundays in the church during the time of the celebration of public worship; and if the marriage be not performed within three months after the last proclamation, the same process must be repeated. The proclamation, the same process must be repeated. The proclamation of banns may be dispensed with by obtaining a disease from some one authorized by the bishop of the discess to grant it, by a special license granted by the archinshop of Canterbury, or by a certificate from the superintendent registrar of the district. (See LIGENSE and MARKIAGE.)

BANQUETE, ban-kell, in Fort., is a step or small terrace of sarth constructed along the inner side of a parapet for the musketeers to stand upon when the parapet is too high to fire over. It is usually made about four feet wide, and raised to within 41 feet of the crest of the parapet.

BANTAN COCK. (See COCK.)

BANTAN COCK. BANTAN TERE. (See Ficus.) BAOBAB-TREE. (See ADANSONTA.)

BAPHA, bif'-i-a, in Bot., a gen, of plants belonging to the nat. ord. Legaminasæ, sub-ord. Casalpinicæ. The species B. nitida yields the dye-wood known in commerce as bar-wood or cam-wood. This dye-stuff is employed, in conjunction with sulphate of iron, to broduce the dark-rest colours of the Funlish bardens.

is employed, in conjunction with sulphate of fron, to produce the dark-red colour of the English bandana handkerchiefs.

BRYGOMET, biff'-o-met, the name of a mysterious symbol, or idol, which the Templars were accused of worshipping in their secret rites. The term is generally supposed to be a corruption of Mahomet, to whose faith the members of the order were accused of having an inclination. You Hammer, however, derives the name from the Greek happhe, haptism, and metis, wisdom, and believes that it denotes certain small human fewers. Found in some of the continental collections. Agures, found in some of the continental collections, with two heat..., and covered with emblems.

BATTISIA, bap tis'-i-a, in Bot., a gen. of plants belong-

ing to the nat. ord. Leguminosa, sub-ord. Papilionacca. The species are numerous, and chiefly natives of North B. finctoria is the wild indigo of the United America. States, yielding a bine dye, resembling, but much in-ferior to, indigo. This plant is used medicinally; the root and herbage being stated to possess antiseptic, sub-astringent, cathartic, and emetic properties.

Barriage by claims (Gr. buptize, I wash or dip), is a sacrament of the Christian church, consisting of the application of water to a person in the name of the Father; the Son, and the Holy Ghost, by which he becomes initiated into the visible church. It is an interest and in the church. institution ordained by Christ himself, when he commissioned his disciples to go and teach all nations, baptizing them in the name of the Father, and of the Son, and of the Hely Ghost. The rite, however, is believed to be much more uncient. Baptism, or purification by water, is said to have formed part of the ceresnony of admitting procedures into the Jewish church; and it is also said to have been the first cerecontrol, such its made said to have been the first cere-mony performed at initiation into the Eleusinian mysteries. Doubtless, as a fit and natural emblem of purification, washing by water may be supposed to have axisted from a very early period. Grotius, indeed, is of opinion that it derived its origin from the Deluge, is or opinion that is derived its origin from the Delingo, having been instituted in memory of the world having been purified by water. Various controversies have arisen in the Church as to how baptism is to be administered, and who are the proper subjects of it; whether it is to be done by sprinking, by affusion or pouring, or by immersion or dipping; whether it is to be administered only to admit, or also to infants. The Baptists are the most important sect that hold to adult baptism and immersion. (See Baptists.) There is no direct evidence to be obtained in Scripture on 203

any of these points. It is even doubtful whether in-fant haptism was precised in the earliest age of the Church. According to Neander, "baptism at first was administered only to adults," and "there does not appear to be any reason for deriving infant baptism from an apostolical institution." It is first alluded to by Irenseus, and was efterwards strongly opposed by Tertullian, a proof, eave Nounder, "that the practice was not universally regarded as an apostolical institution." The doctrine, however, continued to gain ground in the Christian church; but it was not till about the 5th century that it was fally established. Infant baptism, however, seems to be in accordance with the general spirit of Christianity, which makes the children partakers of the blessings bestowed makes the children purtakers of the blessings bestowed upon their purents, and to be a necessary consequence of the doctrine of original sin. We also find the apostles baptizing whole households, of whom it may readily be supposed that infants formed a pert. Many writers, too, regard haptism as corresponding with circumcision in the Jewish establishment, being the badge of distinction between the Church and the world; and hence some of the fathers have held that it should not be administered till the eighth day. In the primitive church, the office of baptizing was vested principally in the bishops and priests, or pastors of the respective parishes; but, with the consent of the bishop, it was allowed to the deacon, and in cases of necessity, even to laymen to baptize. It was administered only on the two solemn festivals of the year, Raster and Whit-suntide. The place of baptism was at first unlimited, but afterwards baptisteries, or fonts (which see), were erected in or near churches for that purpose. By the Church of Rome baptism is defined to be "a sacrament instituted by our Saviour, to wash away original sin, and all those we may have committed; to communicate and all those we may have committed; to communicate to mankind the spiritual regeneration and the grace of Christ Jesus, and to unite them to him as the living members to the head." In the Articles of the Church of England baptism is said to be "not only a wign of Profession, and mark of difference, whereby Christian men are discerned from others that be not obtained; but it is also a sign of regeneration, or new birth, whereby, as by an instrument, they that receive baptism rightly are grafted into the Church: the promises of the forgiveness of sin, of our adoption to be the sons of God by the Holy Ghost, are visibly signed and scaled, faith is confirmed, and grace increased by vistne of prayer to God." The Church prescribes that baptism prayer to God." The Church prescribes that baptism be administered only on Sundays and holyduys; except in cases of necessity. She requires sponsors for infants,—for every male child two godfathers and one godmother, and for every female child two godmothers and one godfather. Some of the early Church believed that baptism had the effect of washing away all previous ain, actual as well as original; and hence the administration of it was sometimes deferred till near the close of life, that all their transgressions might thus he removed. thus be removed

BAPTISTERY, Läp-tis'-ter-e (Gr. haptisterion, a large basin or bath), the name given to the building in which the sacrament of baptism was administered in the early ages of the Christian church. They were at first separated from the churches or basiliess to which they belonged, as they were required to accommodate a number of adult persons desirous of receiving the rite, and who were subjected to total immersion, after the manner in which John the Buptish baptised in the Jordan, at certain times appointed for the purpose. Jordan, at cartain times appointed for the purpose. They were circular in form; but at first were constructed in an hexagonal or octagonal shape, pared with marble, with large basins of the same material, generally three feet deep, either raised above the surface of the pavement and entered by steps, or sunk below its level. Some were of most staborate affoliated and the sunface of the pavement and entered by steps, or sunk below its level. Some were of most staborate affoliated and design; such as the circular baptistery of Pisa, 116 feet in diameter, three stories in height, and surmounted by a dome; and the haptistery of Florence, built of black and white marble, 100 feet in diameter, and magnificently adorned with mosaics by Andrea Tash, and bronze doors of beautiful workmanship executed by Andrea of Pisa and Lorenzo Ghiberti. The largest ever built is the one attached to the church of St. Sophia, at Constantinople: Other baptistevies of note are those of S. Giovanni in Foate, and S. Gio-

vanni Laterano, at Rome; and those at Ravenna, Asti, vanni Laterano, at Rome; and those at Ravenna, Asti, and the principal cities of Tuscany. It is supposed that the polygonal chapter-houses attached to English cathedrals were once baptisteries, and it is probable that the stone edifice at Glastonbury known as the Abbot's Kitchen served for a similar purpose. The places provided in Baptist chapels for the total immersion of adult members of that body are called baptisteries.—Ref. Bayling Cyclopadia.—Arts and Sciences. Barrasse, high-first, a religious sect, who hold that haptism is not to be administrated to adults but only

haptism is not to be administered to adults, but only saptism is not to be administered to maints, our only salter a peraopal profession of faith, and that it is to be administered by immersion, not by sprinkling. The question of infant baptism (see Barrism) sgitated the Church at a very early period, and about the end of the 2nd century Tertulian declared against it. Beveral of the later fathers entertuined similar views; but the destribute of infant harding continued to appead but the dectrine of infant baptism continued to spread, and in the 5th century the opposite opinions were condemned as heretical by several councils. In the Middle Ages, the doctrines of the Baptists continued to gain ground notwithstanding persecution; so that, according to Mosheim, the number who professed them in the beginning of the 12th century amounted to 800,000. From this time to the commencement of the Reformation, Germany was the chief seat of the Baptists, whence they spread over Holland and other parts. Little, however, is known of them in England parts. Little, however, is known of them in England before the 16th century. They were persecuted in the reigns of Henry VIII. and Elizabeth, and several of them suffered at the stake. The first Baptist church was formed in London in 1608, and in 1851 they had in England and Wales no fewer than 2,789 places of worship. In Scotland and Ireland, they have also worship. In Scotland and Ireland, they have also many places of worship; but in the United State they are much more numerous, constituting the most numerous denomination in the country, with the exception of the Methodists. Though all Baptists agree in holding that baptism is only to be administered on a profession of faith in Jesus Christ by the recipient, and that the only acriptoral mode of administering it is by immersion, yet they differ among themselves on many immersion, yet they differ among themselves on many other points, and are split up into several minor sects. The chief body in this country are the Particular Baptista, who are Calvinistic in their views, and hold that Christ died only for an elect number. The General Baptists maintain that Christ died for all men; and these are again divided into the Old Connection or Unitarian, and the New Connection or Trinitarian, the latter by far the more numerous. There are likewise several smaller seets. Baptists differ among them-selves also as to the admission of those who have not been baptized in their way to communion with them at the Lord's table, and to membership; the one class being termed open, the other strict, communionists. The Baptists were smong the foremost in the field of foreign missions, and they have ever been very zealous in that cause. They have colleges at Bristol, Bradford, Pontypool, Haverfordwest, Nottingham, and Regent's Park, London.

Bar, bar (Ang. Sax. bairgan, beorgan, birgan, byrgan), literally, to prevent, keep out or obstruct, to guard, to secure, to fortify, to prohibit.

Bar, in Mus., a perpendicular stroke drawn across

portions or a piece of music, to divide it into equal portions or measures of time. According to Sir John Hawkins, the use of bars is not to be traced further back them 1874, though bars are to be found in the "Ayres and Dialogues" of Henry Lawes, published in 1841. the lines of a piece of music, to divide it into equal

Bas, in African traffic, is used for a denomination of price; payment being formerly made by the negroes almost wholly in bers of iron.

Baz, of gold or silver, is a lump or wedge from mines

BAE, in Her., one of the nine honourable charges or figures placed upon the field or escutcheon, called orfigures piaced upon the field or escutcheon, called ordinaries, and consists of two lines drawn across the field. It differs from the fess in this: the fess occupies a third part of the field, and is confined to the centre; whereas the bar contains only a fifth is not limited to any part, and is never borne singly. It has two diminutives,—the sloset, which is half the width of the bar, and the degrute or derrulet, which is half the width of the bar, the closet. Of the closet, there may be five in one field, or, with regard to cities, a tower or outwork placed at

but the barrulet can be borne only in couples. Bare-genelles are so called when they stand in couples, When the shield contains a number of bare of metal and colour, alternate, of even number, that is called barry

colour, alternate, of even number, tax is called boarry of so thany pieces; as, barry of six argent and gules.

Bar, in Phys. Geog., an obstruction, consisting of sandbanks or roaks, which prevents the entrance of vessels into a harbour at low water. They are, for the most part, formed by the accumulation of earth, mud, and sand, washed away and brought down by the water of a river on its way to the sea. The rush of water, however, generally keeps clear one or two deep narrow channels in the mass for the entrance and exit of vessels; but in some cases, the entrances to rivers have to be kept open by the continual removal of the accumulating detritus by dredging-machines constructed for the purpose.

BAR, in Courts of Justice, is an inclosure or place in which counsel or barristers-at-law stand to plead causes in court. It is also applied to the benches where the advocates are seated; because, anciently, there was a har to separate pleaders from attorneys and others. Hence our lawyers who are called to the and others. Hence our lawyers who are caused to the bar are termed barrieters, an appellation equivalent to licentiates in other countries. (See Barrister.) It is also the place to which prisoners are brought to answer their indictments, &c.

Bar, in Law.—Pleas in bar, or peremptory pleas, are founded on some matter tending to impeach the right

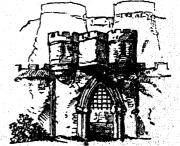
founded on some matter tending to impeach the right of action itself, and their effect, consequently, is to defeat the plaintiff's claim altogether. Pleas in bar are subject to various divisions. For, first, they comprise the class of general issues, which are denials (expressed in a particular form by ancient precedent) of the whole matter in the declaration, or, at least, of the pleas in bar are distinguished by the term of special rates. All these pleas are governed by particular pleas in our are distinguished by the term of special pleas. All these pleas are governed by particular rules of practice; as they involve much legal technicality and nicety, they are generally drawn by pleaders or barristers. In criminal pleading, a special plea to bar goes to the merits of the indictment, and gives a reason why the prisoner ought to be discharged from the presention. They are principally of four binds. reason way the prisoner ought to be discussed from the prosecution. They are principally of four kinds: a former acquittal; a former conviction; a former attainder; or a pardon. (See AUTREFOIS ACQUIT, AUTREFOIS CONVICT, ATTAINDER.)

Babaliffon, bār-ā-lip'-ton, a term employed by old logicians to denote the first indirect mode of the first

figure of syllogisms. A syllogism in baralipton is when the first two propositions thereof are universal affirmathe first two propositions thereof are universal affirmatives, and the third a particular affirmative, the middle term being the subject in the first and the predicate in the second proposition. For example: BA, Every evil ought to be feared. BA, Every violent passion is an evil. LIP, Therefore, something that ought to be feared is a violent passion.

Bars, barb, the name given to a fleet and vigorous breed of horses reared by the Moors of Barbary. They are usually nervous and long-winded, but, as a rule, are not remarkable for symmetrical beauty.

BARBACAN, bar'-b"-han (Fr. burbacane), a watch-tower placed before or over the outer gate of a castle-



#### Barbadoes Cherry

any important point of the surrounding walls. Also, an aperture made in the wall of a fortress to fire through upon an enemy. Also, a fort at the entrance of a bridge, or the outlet of a city, having a double wall with towers. The barbacan of the enatic was a point from which the drawbridge affording the principal way of egress and ingress across the surrounding most could be readily defended by the grand constantly kept there to prevent surprise or a night attack from hostile troops. The barbacan before Walmgate Bar, York, is a good specimen of this old style of fortifying the entrances to towns; and remains of this defensive on ontrances to towns; and remains or this detensive outwork, as applied to castles, may be seen in the ruins of those at Cauterbury and Franlingham, and, in a more perfect state, attached to the castles at Wagwick, Carlisie, Alawick, and Scarborough. The origin of the word is doubtful; but the Norman-French are considered to have derived its use from an Arabic word, and to have introduced it into England at the time of the Conquest

BARBADORS CHERRY. (See MALPIGHIA.)

BARBADOES GOOGEBERRY. (See PREPERITA.)
BARBADOES LAO, bur'-bai-does lik, a commercial name for the petroleum found in Barbadoes and several other of the West-India islands. (See Petroleum.)

BABBARA, bar-ba-ra, a term employed by logicians to denote the first mode of the first figure of syllogisms. A syllogism in barbara is one whereof all the propositions are universal and affirmative, the middle term being the subject in the first proposition, and attribute, or predicate, in the second; as, BAR, All beings who, on reflection, approve virtue, are beings conscious of obligation to act virtuously. BA, All men are beings who, on reflection, approve virtue. RA, Therefore, all men are beings conscious of obligation to act virtuously. BARBARA, bar'-ba-ra, a term employed by logicians

Therefore, all men are beings conscious of obligation to act virtuously.

BARBARIAN, bar-bair'-l-ān, is a term derived from the Greek, and was applied by that people to all that were not Greeks. The Greeks being at that time superior in civilization to their neighbours, the term implied a sense of inferiority. When the Romans first adopted the term, they applied it to themselves, but afterwards to all who were neither Greeks nor Romans. After the fall of the Waters marries in the service and in the service of the service and in the service of the service atterwards to all who were neither Greeks nor Romans. After the fall of the Western empire, it was applied to the Teutonic races, and subsequently to the Moors: hence the name Barbary, given to a district of North Africa. At present, the word is used in the sense of savage, rude, uncivilized.

BARBARISM, in Lit., consists in the employment of unusual or antiquated words or phrases, or the assigning to terms a different signification to that which usage has conferred upon them

has conferred upon them.

BABBARY APE, PIGMY APE, MAGOT, bar'-ba-re, in Zool., a species of ape. It is specially interesting, as its the only one now left in Europe. It is about the size of a large cat, and is greenish-grey in colour, paler underneath. It has no tail, and is sometimes called the tail lear matter. tail-less monkey. The muzzle is not so much elongated as in the baboons, and the facial angle is much higher than theirs. It has small, round, reddish, lively eyes, and its ears resemble those of a human being. The face is nearly naked, and somewhat wrinkled. It usually walks upon four feet; but it can be tamed and taught to walk. though clumsily, on two. They are found in to walk, though clumsily, on two. They are found in large numbers at Gibraltar, and inhabit the precipitous sides of the rock. They are gregatious, and live in parts of the rock inaccessible to man; but they are often seen in great numbers, the females carrying their young ones on their backs. They are very seldom their young ones on their backs. They are very seltom destroyed, on account of the amusement they afford by their gambols and tricks. The Barbary ape probably came to Gibraltar from the north of Africa, where it is very abundant, and inhabits rocky mountains. Bands of them will often plunder gardens, while one of the number keeps a keen look-out. This species of ape possesses a considerable amount of intelligence,

of ape possesses a considerable amount of intelligence, and is often seen tame in this country. They must, however, be taught when young, as they often grow sullen and vicious as they grow old.

BARBER (Barbus vulgaris), barb'-el, a fish frequenting the quiet and deep parts of rivers, and swimming with considerable strength and activity. It derives its name from the barbs or wattles attached about its name from the barbs or wattles attached a

#### Barbette

about ten pounds. large size. "So numerous are they about Shepperton and Walton, writes Mr. Yarrel, Mr. " that 150 lbs. weight have been taken in five hours; and on one occasion it is said that 280 lbs. weight



Barber, barb'er (Lat. barba, a beard), is one whose occupation it is to shave or trim'the beards of other people. The profession of barber, like many others, is an institution of civilized life, and is only known among those nations that have made a certain progress in civilization. We do not read of barbers at the state of the civil barbar and the state of the civilization. at Rome till about the year 451 of the city; but there, as elsewhere, when once introduced, they became men of great notoriety, and their shops were the resort of all the loungers and newsmongers in the city. Hence they are alluded to by Horace as most accurately in-formed in all the minute history both of families and

of large-sized barbel were taken in one day."

of the state. For the entertainment of waiting oustomers, newspapers being then unknown, the barber's shop was usually furnished with a lute or other musical shop was usually furnished with a lute or other musical instrument. But, in early times, the operations of the barber were not confined, as now, to shaving, hair-dressing, and the making of wigs, but included the dressing of wounds, blood-letting, and other surgical operations. (See next article.)

Barber-Chieurgeon, she-rur-jon, was, in former times, the designation under which the distinct and not very similar reconstitutions of harber and averages.

very similar occupations of barber and surgeon were carried on. In England, a company was formed under this name in 1308, and the London company was first incorporated by Edward IV., in 1461. Afterwards, a voluntary association was formed by certain persons, for the practice of surgery; but by 32 Henry VIII. c. 42, 1540, these two codies were united into one body c. 42, 1640, these two bounes were united into the body corporate, under the name of the Barbers and Sur-geons of London. This act, however, also separated the two crafts, declaring that "No person using any shaving or barbery in London shall occupy any surgery. letting of blood, or other matter, except only drawing of teeth;" and surgeous were strictly prohibited from of teeth;" and surgeons were strictly prohibited from exercising "the feat or craft of barbery or shaving." exercising "the feat or craft of barbery or shaving." Four gonethors or masters, two of them surgeons and two tarbers, were to be chosen, who were to see that the spirit of the act was observed. This company continued to exist till the incorporation was dissolved by 18 Geo. II. c. 15, and the barbers and surgeons of London formed into two distinct corporations. The barber-chirurgeon's sign, which is still retained, consisted of a striped pole, from which was suspended a basin; the fillet round the pole indicating the riband or bandage twisted round the carm previous to bloodletting, and the basin the vessel for receiving the letting, and the basin the vessel for receiving the blood. In Edinburgh, the barbers were united with oncor. In Endourgh, the partiers were unlike with the surgeons in one corporation, till about the year 1720, when, in consequence of some disputes about precedency, a process was commenced in the Court of Session, which ended in a total separation of the two Session, which ended in a total separation of the two bodies, the surgeons being found entitled to retain the charter and privileges of the incorporation. Eighty years ago, according to Mr. Creech, in his "Statistical Account of Edinburgh," barbers and perfumers were very numerous in that city, and had splendid shops in all the principal streets. Some of them advertised the keeping of bears to kill occasionally for greasing ladies and cantienems here and the progressor who and gentlemen's hair, and there was a professor who advertised a hair-dressing academy, and gave lectures "on that noble and useful art."

#### Barbican

over the creat of the parapet, instead of the more common mode, through the embrasures,

BARBICAN. (See BARBACAN.)

Barrios, bur'bi-tos, a stringed instrument resembling the lyre, but exceeding it in the number of its strings, the invention of which has been ascribed to

Earness, or Basins, bar-bals, a term employed in fairness to denote the tracts of superfluous flesh which grow up in the channels or intervals underneath the

tongue of a horse.

BARCAROLLE, bar'-ca-roal (Ital barcaruolo, a boat-man), certain songs composed by the Venetian gon-dollers, and sang by them in their boats. The style of these airs is simple and natural, like the manners of the people who produce them; and they posses a kind of artless beauty which not only strikes common sears, but delights even the cirtues. The Venetian gondoliers have the liberty of visiting all the theatres gratis, which gives them an opportunity of cultivating their ear and taste without expense. The gondolier songs are many of them so graceful and pleasing, that the musicians of Italy pride themselves on knowing and singing them.

BARCLAY AND PREKINS' BREWERY .- This establishment, which is situated in Park Street, Southwark, is one of the largest breweries in the world. It was originated by Henry Thrale, the friend of Dr. Johnson, in 1773, and was purchased by Messrs. Barclay and Perkins, at his death, for £135,000. At present, the establishment is of grantic proportions: more than 600,000 gallons of water and 2,600 quarters of malt are used weekly. The brewing-coppers will hold 120,000 gallons, and the fermenting-vessels will contain 1.500 barrels of beer. Two steam-engines, equal to 7.5-horse power, are employed to work the machinery; and in order to distribute the ale and porter amongst the retail sellers in London, more than 200 horses and

drays are employed.

Bab, bard (Celt. bard, a poet), a word of rather uncertain derivation, but most commonly applied to the professional poets among the Celtic natious. Tacitus (Germ. 3) tells us that the ancient Germans sought to infuse military ardour into their warrions by the songs of bards; and Strabo and Ammianus Mar-cellinus say that the songs and hymns of the bards were famous in their day among the Celtic peoples. They seem to have belonged originally to all the war-like nations of Western Europe; and it was only as civilization advanced that they were compelled to retire to the mountain retreats before the march of retire to the mountain retreats before the march of progress. Accordingly, we find them strongest in Wales and Ireland. Warton (in his History of 1984; 134 Pactry, vol. i. p. 37) tells us the British bards were criginally an appendage of the Druidical hierarchy; but it is pretty well established, that long after the Druids were extinct, the bards, who had attained a sort of eivil capacity, continued to flourish for a long period among the Celts. It is even related of Edward I., that the more thoroughly to aid his conquest by the sword, of the ancient Welsh, he gave orders to have all their bards destroyed, that, when the source of inspiration was cut off from them, their warriors might the more willingly succumb to English sway. By the laws more willingly succumb to English sway. By the laws of Hoel Dha, given about the year 940, among the Welsh, it was enacted that the court bard was to be a domestic officer of the prince, and to occupy the eighth place in his court. The bard was, besides, to hold his lands free. The prince was to allow him a horse and a woollen role, and the queen a linen gar-ment. When invested with office, he received from his prince a harp of rare workmanship, and from his queen a ring of gold, neither of which he was to part with on any account. He was to lodge with the prefect of the palace; and on the three annual festivals he had the privilege of sitting next this functionary, who was enjoined to deliver the harp into his hand. Any person who injured this royal bard had to pay a Any person who injured this royal bard had to pay a fine of six cows and 120 pence; and any one who murdered him had to pay 126 cows. These bards had enormous memories, were first-rate genealogists, and not unfrequently flattered the vanity of the courtiers to a great degree by their highly-coloured narratives of the public and private transactions of the nation to which they belonged. They were consequently revealed.

# Bargain and Sale

renced almost as much by the Welsh heroes as if they had possessed powers of divine inspiration. They were reformed and regulated by Gryffyth ap Conon, king of Wales, in 1078 a.b. Periodical eisteddicas, or sessions, of the bards, and their successors the ministrela, have continued in Wales down to our owntime. The Irish bardie history begins with the Milesian invasion. There were three classes of them in Irefand,—these who turned the tenets of religion into seven and those who turned the tenets of religion into verse, and who in battle raised the war-song; those who sat in the open air and chanted the laws of the nation; and the open air and chanted the laws of the nation; and those who sang history and the exploits of herces. Their profession was hereditary. Their songs are strongly marked by traces of Scaldic imagination, whigh they infused into the Welsh poetry when Gryflyth brought them over, early in the 41th contury, for the purpose of improving the Welsh songs. Agr. The works of Warton, Pennant, Walker, Jones, and Reauford.

BARDESANISTS, bar-de'-sa-nists, a sect of early heretics in the East, who took their name from Bardesanes, a native of Edessa, in Mesopotamia, who flourished about the year 170. They held that Christ was not born of a woman, but brought his body with him from heaven; that the devil was not created by God, but was a self-existent independent heing; and that there was no

resurrecti. i of the body.

BAREBONES PARLIAMENT, bair'-bones, a name given by way of represent to what is otherwise called the Little Parliament, summoned by Cromwell after the dismissal of the Long Parliament. It was so called after Mr. Praisegod Barbone, a "leather-merchant in siter Mr. Praisegod Barbone, a "leather-merchant or Fleet Street, and frequent in prayer," who was one of its members. It met on the 4th of July, 1653, and of the 140 members summoned to attend, only two did not come up. Very mistaken ideas long prevailed as to the character of this assembly. The members were said to have been chosen from the lowest, meanest, and most ignorant of the people,—the very dregs of fanatics. The works of Mr. T. Carlyle and others have served to put their character in a very different light.
"They were men got together by anxious consultation of the gody clergy and chief Paritan light in their respective counties, not without much earnest revision and solemn consideration in all kinds." They were, indeed, a body of most sincere and earnest men, only too eager in their efforts to accomplish a great national sod cager in reformation; and failed because they attempted too much, rousing a storm of hostility from all classes whose interests they turestened. The great business they set themselves to accomplish was "no less than introducing the Christian religion into real practice in the social affairs of this nation." "They had decided on abolishing titles; on supporting a Christian ministry by some other nethod than titles; nay, far worse, they had decided on abolishing the court of chancery." These questions not only raised storms without, but These questions not only raised storms without, but leat to dissensions and intrigue among themselves; so that they at last resigned their power into the hands of Cromwell, on the 12th of December, 1853, atternating as for five months and some odd days.—Ref. Cromsell's Letters and Speeches, by Thomas Cariyle.

BARE POLES, bair poles .- The term bare poles implies a ship lying-to, without any sail set whatever, in a gale of wind, renerally speaking, in consequence of being on a lee shore.

being on a lee shore.

BARGAIN AND SAIE, bar'-gain (Fr. barguigner), in the English law, is a contract whereby the bargainer, for consideration, actually, or by the deed admitted to have been paid, bargains and sells,—that is, contracts to convey the land to the bargainee, and becomes by such bargain a trustee for, or seized to file use of, the bargainee; and the Statute of Uses compistes the purchase, or, as it has been averaged the bargain trustees. chase, or, as it has been expressed, the bargain first vests the use, and then the statute vests the possession. But, as it was foreseen that conveyances thus made would want all those benefits of notoristy which the old common law assurances were calculated to give, to prevent clandestine conveyances of freeholds, it was enacted by statute 27 Hen. VIII. c. 16, that such bargains and sales should not enure (be available) to pass a freshold, unless made by indenture, and enrolled within six months in one of the courts of Westminster Hall, or with the custos rotulorum or clerk of the peace of the county. Clandestine bargains and sales

of chattel interests, or leases for years, were thought not worth regarding, as such interests were very precarious till about six years before, which also consisted them to be overlooked in framing the Statute of Uses; and therefore such bargains and sales are not directed to be enrolled. This omission gave rise to the species of conveyance by lease and selesse. Before the adoption of this last mode of assurance, the usual method of transferring freehold estates was by a deed of feoffment, which was executed on the land: and nieraod of transferring freehold eastes was by a deed of feoffment, which was executed on the land; and corporeal possession was given by the feoffer delivering to the feoffee a clod of earth, in the name of the whole estate, which was called livery of seizin. This was done in the presence of several witnesses, who attested the in the presence of several witnesses, who attested the fact by signing their names under a memorandm indersed on the deed. To obviate this, the plan of lease and release was invented. A lease was granted, or a bargain and sale made, by the transferrer to the transferree for one year, by which he became invested with the possession, and by the release the property was conveyed to certain uses thereby declared. But now a release of freehold estate is declared to have the same offers as lease and release by the two varieties. same effect as a lease and release by the same parties; and therefore the deed of bargain and sale, so far as and therefore the deed of bargain and sale, so far as uddeets freeholds, has become obsolete. Bargain and sale of copyhold estates is still a mode adopted to enable a purchaser to take admission without a currender, when a testator merely directs a sale of his estate to be made, instead of devising it to his trustees upon trust to sell. The trustees can in such case execute a bargain and sale without being admitted and extended to the number of a similar slock and surrendering to the purchaser. A similar plan is adopted in the case of bankrupts' copyhold estates, the bargain and sale being executed by the commissioner to the purchaser. A bargain and sale, or an assignment of chattels personal, may in general be by parol,—that is, either by mere writing or by word of mouth, and does not require the solemnity of a deed, for the extual deligency of possession. But instruments nor the actual delivery of possession. But instruments in writing are frequent, and in some cases essential, and are either in the form of a note or memorandum, or of a regular assignment or bill of sale. In the case of goods sent from abroad, the transfer is effected by a bill of lading, which is in its form a receipt from the captain of the vessel to the shipper, undertaking to deliver the goods (on payment of freight) to some person whose name is therein expressed, or indersed thereon, by the shipper; and the delivery of this instrument (independently of the actual delivery of the goods) will suffice to pass the property in them to the party so named, or to any other person to whom he may think fit to indorse it over. A contract in writing is necessary to make binding a contract for the sale of goods to the value of £10 or unwards, where no payment or delivers in additions in the sale. the value of £10 or upwards, where no payment or delivery is made under it, or carnost given. It is also necessary, on the grant and assignment of life annuities, the transfer of ships, and the assignment of a copyright or patent right; and a bill of exchange, promissory note, or cheque, or draft on a banker, when payable to the order of a particular person, can be assigned by him only under a written indorsement of his game. his name.

Barcz, barje (Du. bargie), a boat of state or pleasure, with elegant apartments, canopies, and cushions, cquipped with a band of rowers, and adorned with flags and streamers, generally used for processions on the water by officers of state, magistrates of great cities, &c. There are also barges of a smaller kind, cities, &c. There are also barges of a smaller kind, for the use of a limitals and oaptains of men-of-war. These are of a lighter frame, and may be easily hoisted into and out of the slips to which they belong. (See Itoar.) It is also the name of a flat-bottomed vises of burden, used on rivers for conveying goods from one place to another, fer loading and unloading a hips, and has various names; as a West-country barge, a sand-burge, a row-barge, &c.

Barge-Board (Ger. bergs-board).—In Goth. Arch., the slate or tile projection over the gables of a building is called the barge-course; and, by way of ornament, or

the state or tile projection over the gables of a building is called the barge-course; and, by way of ornament, or to protect the plaster, which is applied under the barge-course between the roofing and the wall, from injury from the weather, Boards, sometimes richly carved and ornamented, technically called barge-boards, are fastened to the ends of the rafters that lie on the gable end. Good specimens of these decorative 207

boards may be seen in Coventry, Oxford, and many old English towns. The terms barge-board and bargecourse eeem to be a corruption of parge-board and parge-course, taking their names from the parget or plaster of the latter.

plaster of the latter.

Baritus, ba-ril'-lit (Sp.).—The commercial name applied to the impure sods-ash procured by calcining various species of Salsola, Salicornia, Chempodium, and Atriplex. The plants grow near the ses, in salt marshes, and are extensively cultivated in Spain, Sicily, and the Canary Islands. The seed is sown at the end of the year, and the plants are gathered towards the end of autumn, dried, and burned. Barilla is a grey semi-lused mass of ashes, and contains about 30 per cent. of carbonate of sods. The importation of barilla into Great Britain was for merly very large, but has been reduced to nothing of merly very large, but has been reduced to nothing of late years, by the various improved methods of manufacturing sods from common salt. (See Sona.)

BARTONE. (See BARTONE.)
BARTONE, bair-i-um (atomic weight 68.5, symbol
Ba), in Chem., the metallic base of the alkaline earth
baryta. This metal was discovered by Davy in 1809, and was named brium, from the Greek word burus, heavy, on account of the excessive density of its compounds. It may be formed, by voltake decomposition, pounds. It may be formed, by volute decomposition, from the anhydrous chloride, or by passing the vapour of potassium over red-hot baryta contained in an iron tube, a mixture of oxide of potassium and barium is formed, which is amalgamated with mercury. On distilling off the mercury in an atmosphere of hydrogen, the metal barium is left behind in a somewhat impure the metal burum is left behind in a somewhat impure state. Owing to the difficulty with which it is prepared, little is known of its properties. Its specific gravity is said to be 4. It is a white, slightly malleable metal, decomposing water at ordinary temperatures. It quickly tarnishes in the air, from the absorption of oxygen. When moderately heated, it burns with a deep-red fiame. It forms two oxides,—the protoxide acid, BaO, and the peroxide, BaO<sub>2</sub>: the former only forms sait. forms salt.

forms sait.

Barum, Chlorid of, in Chem., unde by dissolving carbonate of baryta in hydrochloric acid, evaporating and crystallizing. It is a colourless sait, crystallizing in flat four-sided tables, and dissolving in three parts of cold and two parts of hot water. Its solution forms the usual test for sulphuric acid, which it indicates by forming a white precipitate insoluble in nitrie acid.

Darming a white precipitate insolution in intro socia.

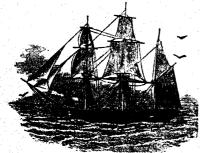
Rabium, Penoxube or—The peroxide or binoxide of barium is much used in chemistry, it being prone to give up its second equivalent of oxygen to exthem efficiently, boron, and netals, at a red heat. Hence its use in forming rare peroxides of certain metals. It is formed by passing oxygen over anhydrous baryts at a red heat, or by heating to reduces a mixture of fermil parts of children of formula parts. of equal parts of chlorate of potass and pure baryta.
The chloride of potassium is washed out, and the hydrated binoxide remains behind in the form of a white powder. It has been proposed by Boussingault white powder. It has been proposed by Boussingault to prepare oxygen cheaply by passing a current of atmospheric air over heated baryta. The binoxide of barium formed is heated, and parts with the oxygen absorbed, leaving baryts behind, which is again submitted to the oxidizing process just mentioned. These processes are repeated ad infinium, always using the same portion of baryts. The method does not, however, appear to have been made commercially available.

Bark, bark (Dan.) in Bot. the external coating of

same portion to taryts. The metabol does not, nowever, appear to have been made commercially available.

BABK, bark (Dan.), in Bot., the external coating of
an exogenous or discovitedonous stem and its branches.
It is distinguished from the rind or false bark of an
endogenous or of an acrogenous stem, by its mode of
growth, and by the ease will which it may be separated
from the wood beneath. The bark presents three distinct layers, independently of the epidermis which is
common to it, with other external parts of the plant.
These three layers, proceeding from within outwards,
are known as the liber, or inner bark; the cellular envelope, or greenlayer; and the suberous, or corkylayer. Some
botanists apply to these three layers, respectively, the
Grock terms, endophiloum, mesophiloum, and epiphiloum.
The bark is connected organically with the wood by
means of the medullary rays and cambium-layer. (See
SYEM.) It develops in an opposite direction to that
of the wood; for while the latter increases by additions
to the outer surface, the bark increases by additions

to the inner. Each layer of the back grows separately; the two outer layers, constituting the cellular system of the bark, rarely continue to grow after a few years, but become dead structures on the surface of the tree. The inner back, however, continues to grow throughout the life of the individual, by the addition of annual layers on its inner surface from the cambium-layer of layers on its inner surface from the sambium-layer of the wood. In some trees, the oak for example, up to a certain age, these fiber layers may be readily observed. (See Lines.) The outer layers of the bark, from the dis-tension to which they are exposed by the growth of the wood beneath, generally become cracked, in various directions, and give a rugged look to the trunk, as in the sim and cork-oak. In some trees, however, as the basch, the hark always remains smooth, owing partly besch, the bark always remains smooth, owing partly to the small development of cellular layers, and partly to the great distensibility of the layers. There are several kinds of bark which enter largely into commerce, being used for processes in the arts, or for medicines. e will be found noticed in separate articles, under These will be found noticed in separate articles, under the botanical names of the genera which include the plants producing them. For oak-bark, quercitron-bark, and cork (see Quencus); Peruvian bark (Cin-chona); cabbage-bark, Surinam bark (Andira); cas-carilla bark (Ckoton); wild-cherry bark (Crasus), Bark (Irish, bare; Fr. barque), a general name given to small ships. It is, however, peculiarly appro-priated by seamen to those which carry three masts without a mizen-topsail. It is also used by mariners



trained in the coal-trade to indicate a broad-sterned ship without a figure-head. A long-bark free small vessel without a deck, and longer and lower than the common bark. It is built after the model of a sloop,

common bark. It is built after the model of a sloop, and is in many places called a double sloop.

BARKER'S MILL. (See TURRINE.)

BARKING-BIRD, bar'-king (Pteroptochos).—A native of the South-American srchipelago, building its nest close to the ground, among the underwood and faller branches. Says Mr. Darwin, "Its name is well applied! I defy any one, at first, to feel certain that a small dog is not yelping somewhere in the forest. Just as with the cheucan, a person will sometimes hear the bark close by; but in vain may endeavour, by watching, and with still less chance by beating the bushes, to see its anthor; yet at other times the "guid-guid' comes fearlessly near."

BARKS, WATER, small vessels used in Holland for

BARES, WATER, small vessels used in Holland for the carriage of fresh water, and for fetching sea-water to make salts of, with a deck, up to which they are

filled with water.

Bars Srovs, in Gardening, a pit built of brick in a hothouse or house of glass, filled with refuse bark from a tanyard, in which potted plants are plunged which require bottom-hent, or heat round the roots, and a moist amosphere. The hest and moisture are pro-duced by the fermentation of the bark. These bark-beds or stoves are used for the culture of all tropical bets or stoves are used for the culture of all tropical plants, such as pines, palms, &c., and for striking cuttings of all sorts. They are principally valuable for the regular bottom-heat they supply, which varies from 60° to 70° Fahrenheit, as soon as the fierce heat produced in the early stages of fermentation has sub-aided.

BARLAIM AND JOSAPHAT, har lam, jos'-a-fat, is the

name of one of the most widely-spread religious romances of the Middle Ages, which relates the convertion of an Indian prince, Josephat, by the herrnit Barlasm, It was written originally in Greek, not by John Damascene, as some have supposed, but by an Rastern, probably an Ethiopian, Christian. A German-translation of the original was published by Liebrecht (Münster, 1847). From a Latin version which was extensively circulated in the Middle Ages, were made three verse and several proper translations in Franch. From circulated in the Middle Ages, were made three verse and several prose translations in French. From a Provençal original in the beginning of the 14th century sprang the Italian "Storia di S. Barlaam;" and in Germany, Rudolf von Ems took his poem "Barlaam and Josaphat" from the Latin version. It was also translated into Spanish by Juan de Arze Sclorsane; into Bohemian and Polish; and into Norwegian ("Barlaams och Josaphats Saga"), by King Hakon bverresson (Christians, 1852). It has evén been translated into the Talaga Isanguage of the Philippines, and there printed (Manilla, 1712).

Manila, 1712).

Barley. (See Hordrem.)

Barley-Berry, bar-le-breek, the name of a popular pastime very common in the time of James I., and pastine very common in the time of James 1., and which is frequently referred to by older writers. It was played by six persons, three of each sex, who were formed into couples. A piece of ground was then divided into three parts, the centre one being called hell. One of the couples was stationed in this hell, hell. One of the couples was stationed in this hell, and their effort was to catch either of the other couples and their effort was to catch either when the in crossing from the one side to the other, when the couple caught had to take up their place in the centre. The couple in the centre were bound to keep together; but the others, when hard pressed, might sever. out the others, when hard pressed, might sever. When all had been taken, the game was ended; and the last couple taken was said to be in hell, their punishment appearing to have consisted in kissing each other. Games of a similar kind, more or less modified, are still practised by young persons both in England and Scotland.

BARM. (See YEAST.)

BARMECIDES, or BARMERIDES, i. e. children of Barmek, bar'-me-sides, is the name of a celebrated Persian family, amongst the wealthiest and most powerful in isminy, amongst the weatmest and most powerful in the province of Khorasan, which played an important part in history under the earlier of the Abbaside califs. Kaled-ben-Barmek, son of Barmek, the first of whom we have any authentic accounts, was the prime minister of Abul Abbas Saffah, the first Abbaside calif, and his influence did not diminish during the reigns of Al-Mansur and El Mahdi, the latter of whom intrusted him with the education of his son, afterwards so cele-beded ander the name of Harun Al Raschid. Yshis, the son of Kued, according to Eastern historians, was possessed of the most distinguished virtues, and ren-dered the most eminent services to the calif Harun, who, upon his accession, in 786 A.D., nominated him his vizier. Equally versed in civil matters and in all his vizior. Equally versed in civil matters and in an that pertained to the art of war, he contributed greatly to the prosperity of the reign of Harun Al Raschid. Yahia had several sons, of whom the best known are Fadhl and Djafar (the Giafur of the Arabian Nights), both of whom partook of the fortune and favours of their father. Fadhl had the administration of justice, their father. Fadhl had the administration of justice, and to Djafar was confided the superintendence of the palace of the calif and the education of his son, Al Mamun. After a period of unequalled prosperity, this family was (in 803) stripped of all its power and wealth, and treated in the most cruel manner by the very calif who was so much indebted to it. Djafar was put to death at the age of S7; Yahia and his son Fadhl were both imprisoned in a remote part of the country; and all the relatives or friends of the Barmardies were in all the relatives or friends of the Barmerides were involved in the same disgrace, some being massacred, others imprisoned and deprived of their goods. The causes assigned for the audden and terrible reverse of fortune are very various. According to some, Harmwas jealous of the power and influence of the Barmerides; according to others, Djafar had disobeyed the calif's orders in setting at liberty Prince Alide, whom he had commanded to be put to death; while, according to others, Djafar had married or seduced a sister of the prince, the beautiful Rhassa. The misfortunes of the Barmerides have afforded the Oriental poets materials for numerous songs, sad have also formed the subject of several tragedies; among others, that of La all the relatives or friends of the Barmerides were in-

### Barnabas

Harpe, entitled, "The Barmecides," which appeared in 1778. An able and learned article on the Barmecides is to be found in the German Encyclopedia of Ersch

Barnahas, THE EPISTLE OF St., bar-ad-bis, an apocryphel work ascribed to Barnabas, the companion and fellow-labourer of St. Paul. This epistle lays greater claim to canonical authority than most of the other apoeryphal writings. It is cited by Clemens Alexandrinus, Origen, Eusebius, and Jerome, who ad-mit it to be the work of Barnabas, but declare that it ought not to be esteemed of the same authority as the canonical works. It is published by Archbishop Wake among his translations of the works of the Apostolical among his translations of the works of the Apostolical Fathers, in the preliminary dissertation to which he gives the arguments adduced to prove it to be the work of St. Barnabas. It is, however, generally be-lieved to have been written by some converted Jew in the 2nd century, and seems to have been addressed to the unconverted Jews. It is divided into two parts. In the first part, the writer shows the unprofitableness of the old has and the accessive of the inversation and of the old law, and the necessity of the incarnation and death of Christ. He cites and explains allegorically certain passages relating to the ceremonies and precepts of the law of Moses, applying them to Christ and his law. The second part is a moral instruction, under the notion of two ways,—the way of light, under which is given a summary of what a Christian is to do that he is given a summary of what a Christan is to do that he may be happy for ever; and the way of darkness, with the different kinds of persons who shall be for ever east out of the kingdom of God.

BARNABAS, GOSPEL OF ST., an apocryphal work ascribed to Barnabas. It relates the history of Christ very differently from the Evangelists, and is believed

to be a forgery of some nominal Christian, and after wards altered and interpolated by the Mohammedans, the better to serve their purpose. It corresponds with those traditions which Mahommed followed in the Koran.

BARNABAS DAY, St., a Christian festival, celebrated

on the 11th of June.

BARKANTER, bar's ü-bites, the name of a religious order founded in the 16th century by three Italian noblemen of Milan, who had been advised by a famous preacher of those days to read carefully the epistles of St. Paul; and hence they were also called Clerks of the order of St. Paul. They took the name of Barnabites from having performed their first exercise in the church of St. Barnabas, at Milan. They were confirmed by Pope Clement VII. in 1533. The order dress in black, like the scular clergy, and devote themselves to mis-sions, preaching, and the instruction of youth. It only

exists at present in some parts of Italy.

Barnacle, bar nu-kel (Port. bernacu), a marine animal, which attaches itself to ships bottoms and other mal, which attaches itself to ships bottoms and other submarine substances. To such an extent will these little creatures adhere to the sides and bottoms of floating vessels, as to impede their progress and render necessary their docking and cleansing.

Banacle Goose. (See Brencle Geess.)

Banoco, 6a-ro'-ko, in Log., is a name given to the fourth of the second figure of syllogisms. A syllogism in harmon has the first propositive universal and affirm.

in baroco has the first proposition universal and affirm-ative; but the second and third particular and negative, the middle term being the predicate in the first two propositions; as, BA, Every man is a biped. RO, Every animal is not a biped. CO, Therefore, every animal is not a man.

BAROLITE, bar'-o-lite (Gr. barus, heavy, lithos, stone) carbonate of baryta, or witherite. It contains 80 parts of barytes and 20 of carbonic soid. It is found at Alston Moor, in Cumberland, and at Anglesack, in Lancashire. It is much used in the North for poison-

ing rate.

ing rats.

BAROMETER, bd-rom'-e-ter (Gr. baros, weight, metron, a measure), an instrument for measuring the weight or pressure of the atmosphere. It may be said to be the invention of Torricelli, who first demonstrated the existence of the atmospheric pressure by means of a column of mercury contained in a glass tube. The story of the invention cannot be too often re-told, as it illustrates in a most attribing meaner the triumph of

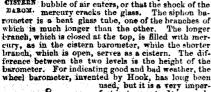
## Barometer

water on the withdrawal of the air was accounted for by the ancient dictum "Nature abhors a vacuum which was universally accepted as a great truth. which was universally accepted as a great truth. By thus personifying Nature, and connecting phenomens with her likes and dislikes, the progress of true science was greatly impeded; for by habit men got to attach as much importance to some meaningless phrases as to actual facts. To question Nature's schorrence of a vacuum was a kind of scepticism, which must have appeared to the contemporaries of Torricelli almost as reproducible as religious doubt. The access of an reprehensible as religious doubt. The sages of au-tiquity had declared that a vacuum was repugnant to Nature, and any one who ventured to dispute this point was clearly guilty of an attempt to subsert the noble and perfect system of philosophy taught by those sages. The first observation which led Torricelli to ask Nature experimentally why she abhorred a vacuum, was said to have been made by some pump-makers of Florence, who found that water would not rise higher than thirty. two feet, or thereabouts, when the air was exhausted. They applied to Galileo, who was regarded as a cunning man in mechanics, for a solution of this problem, and he, not having got rid of the old metaphysical con-ception of Nature, gave them the simple answer, that the power of Nature to contend against a vacuum ceased when she had destroyed one thirty-two feet high. It is not unlikely that this answer of Gailleo was ironical, for it is certain that he afterwards rejected the theory of Nature's horror altogether, though without substi out the problem, and to him the happy idea occurred, that the weight of the atmosphere might be the counterpoise to the thirty-two feet of water in the pump. He determined to test this hypothesis by experiment, and hit on the beautiful expedient of employing mercury, or quicksilver to counterpoise the weight of the air. It is not difficult to trace the line of reasoning which led to the adoption of mercury. He saw that, provided it was the weight of air which balanced the column of was the weight of air which balanced the column of mater, it would necessarily suctain a much shorter column of mercury; in fact, that the height of the column would be reduced in the proportion in which the liquid metal is heavier than water. Thus, mercury being about fourteen times heavier than water, bulk for bulk, the fourteenth part of thirty-two feet, or about two feet four inches would supply the place and about two feet four inches, would supply the place, and produce the effect of the water. Torricelli's experiment produce the cuest of the water. Torricell'a experiment was conclusive, and the notion that water rises in a pump through Nature's abhorrence of a vacuum ceased to retard the progress of discovery. The experiment is thus performed: a glass tube about a yard long and a quaster of an inch internal diameter, is sealed at one a quarter of an inch internal diameter, is sealed at one fad, and completely filled with insercury. The aperture being closed by the thumb, the tube is inverted, the open end placed in a vessel containing mercury, and the thumb removed. The tube being in a vertical position, the column of mercury sinks, and after oscillating some time, it finally comes to rest at a height which, at the level of the sea, is about thirty inches above the mercury in the vessel. The weight of the column of mercury in the tube is supported by the column of mercury in the tube is supported by the pressure of the atmosphere on the mercury in the open vessel. There is no contrary pressure on the mercury thus supported, because the upper end of the tube is closed; but if it be opened, the atmosphere will pressequally inside and outside the tube, and the mercury will at once sink to the level of that in the vessel. (See ATMOSPHERE ) Torricelli died shortly after having thus ATMOSPHERE. Torrices need society sheer thank thus devised a simple means of weighing the atmosphere. He left this discovery incomplete; for though he had antifactorily proved that the weight of the water in the pump and that of the mercury in the tube each formed a counterpoise to something, he had not confirmed his correct surmise that this something was the pressure of the atmosphere. To Pascal the world is indebted for this confirmation; he first proposed that Torricell's experiments should be made at different heights above the sea-level, to see whether the column of mercury would indicate, by falling or rising, any decrease or increase of pressure. Experiments made by his request at the base and on the summit of Puy-de-Dôme, in story of the invention cannot be too often re-told, as it is the buse and on the summit of ray-de-bone, in illustrates in a most striking manner the triumph of Anvergne, proved beyond a doubt that it was really inductive philosophy over deep-rooted error. Up to the weight of the atmosphere which supported the tage of Torricelli no one thought of investigating the phenomena of a common pump. The rising of the was three inches lower than that observed in the valley.

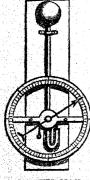
#### Barometer

The straight glass tube inverted into a vessel of mer-cury, as in the experiment of the Florentiue philo-sopher, may be regarded as the simplest form of the mercurial barometer. To render this in-

strument more postable, the eistern con-taining the moreury, into which the open end of the tube dips, is covered in, the external air being only admitted through a very small bole. The tube is usually fixed very small none. Lie tube in usually have in a mallogary frame, on the upper part of which there is a scale graduated in inches from the level of the mercury in the cisten; a movable inder shows on the scale the level of the mercury. A thermometer is generally attached to the same frame; the annexed figure shows such an arrangement. There is one serious fault in a barometer of this kind: the fixed scale does not always indi-cate the true height of the column above the surface of the mercury in the cistern, for this surface necessarily rises as the column sinks. If the diameter of the cistern is large relatively to that of the tube, the error from this source is lessened. In Fortin's barometer the base of the cistern is made of leather, and can be raised or lowered by means of a screw. This contrivance enables the observer to obtain a constant level, and it greatly increases the portability of the instrument. In travelling, it is only neces-sary to raise the leather till the mercury, which rises with it, completely fills the cistern; the barometer may then be inclined, or even inverted, without any fear that a bubble of air cuters, or that the shock of the



fect instrument. It is merely a siphon barometer councet ed with a needle, which moves round a graduated circle. The annexed figure shows the instrument before the mercury is introduced. In the specter leg of the siphon a float placed, which rises and falls with the mercury. A string attached to this float passes round a pulley, to which the needle is fixed, and at the other end there is a small weight, somewhat lighter than the float. When the pressure varies, the float sinks or rises and moves the needle round to the corresponding points on the scale. The barometers in domestic use, which are called weather-glasses, are of



wratere-Glass. this kind. The words rois, fine, variable, &c., generally appear on the graduated circle; but they do not afford any reliable indications of the weather. Change of weather frequently coincides with change of pressure; and experience has proved that the barometer may be used as a weather-indicator, but cannot always be depended on. As a rule, a falling barometer prognosticates rain; a rising barometer, fair weather. When the column of mercury is unsteady, it indicates an unsettled condition of the atmosphere; a steady baro-meter indicates that the weather at the time will last. If the mercury be low, the weather will remain bad; if the mercury be high, the weather will continue fair. A sudden falling of the barometer almost invariably presages a storm. The connection between the variations of the weather and the pressure of the atmosphere is, however, a subject very ill understood. For deter-210

#### Baron

mining altitudes, the barometer is an invaluable instru ment. In ascending mountains, the mercury is found to sink about a tenth of an inch in 90 feet; so that, if the mercury fall an inch, we have ascended near 900 feet; but this is subject to variations from change of temperature and other causes, which render vario corrections necessary. The most important barometric measurements of late years are those which have been measurements of late years are those which nave been made by Professor Guyot on the Appalachian mountains, and which have greatly advanced physical geography. There are many forms of the mercurial barometer, but they are all modifications of the siphon or the cistern. The instruments for measuring the pressure of the atmosphere without employing higuids are described under the head of AMEROID BAROMETER.

describes under the head of AREROID HAROMETER.

BAROMEZ. (See CINDTURN.)

BAROME, bin' on (Fr. baron; Ital. barone), at title denoting the lowest rank in the peerage, the degree of nobility next below that of viscount. The etymology of the word is very doubtful, but it is probably derived from the Latin word baro, which at first signified a dull, stupid fellow, and afterwards by some transmittation, come to afterwards, by some strange transmutation, came to denote a person of distinction. Originally, the name baron was applied in England to all the nobility, of whatever rank; because all noblemen were barons, even although they occupied a higher rank in the peerage. But it has sometimes happened, that when an ancient baron has been raised to a new degree of peorage, in the course of a few generations the two titles have descended differently; one, perhaps, to the maie descendants, the other to the heirs general, whereby the earldom or other superior title has subsisted without a barony; and there are also modern instances where earls and viscounts have been created without amezing a barony to their honours; so that now the rule does not hold universally, that all peers are barons. The origin and antiquity of barons have occasioned great inquiries among English antiquaries. The most probable opinion seems to be that they were the tenants probable opinion seems to be that they were the tenants in chief of the crown, persons who held lands of the crown by military or other services, and who were bound to personal attendance in the king's court when he should please to summon them, to do homage to him, and to assist in the administration of justice and in the transaction of other business that was done in the court of the king. Thus, originally, all lords of manors, or barons that held of the king in capite, had seats in the great council or parliament In the reign of King John, however, the conflux of them became so great and troublesome, that the king was obliged to divide them, and summon in person only the greater parons, leaving the smaller ones to be summoned by the sheriff, and, as it is said, to sit by representation in another house, which gave rise to the separation of the two houses of parliament. By degrees, the title came to be confined to the greater barons, or lords of parliament only, and as these were summoned by writ, the production of that writ constituted their right to sit and vote. Hence, actual proof of a barony by tenure became no longer necessary to constitute a lord of par-liament; but the record of the writ of summons to him or his ancestors was admitted as a sufficient evidence or in sneestors was admitted as a subject to vidence of the tenure; and hence, too, the acquisition of territory no longer, as originally, ennobled its possessor. Another class of barous—barons by patent—was constituted by Richard II. (the first being Beauchamp, of Kidderminster), who received it as a title of honour, irrespective of the tenure of lands. In barons by writ, the dignity descends to heirs general; in barons by patent, it goes according to the teneur of the patent.
When a person, who was a baron by tenure, received the king's writ to repair to the parliament, the receipt of the writ, and obedience to it, created in him a dignity as a lord of parliament, which adhered to him during his life, and was transmitted to his heir. Some, however, are of opinion that there must be at least two writs of summons, and a sitting in two distinct par-liaments, to evidence an hereditary berony; but there have at least been many adjudications of claims to dig-nities made in accordance with the former view. The mere writ, however, does not ennoble a man unless he has actually taken his seat in the House of Lords. In consequence of the inconvenience thus attending it.

creation by letters patent is now usually adopted, ex-

cept in the case of the eldest son of a peer, there being here no danger of the children losing their nobility, even should their father never take his seat. Creation by letters patent is perfect and complete as soon as the great seal is sffixed; but it labours under this disadvantage, that the course of descent by which it is intended that the dignity should pass must be specifically laid down in the patent, otherwise it ceases with the life of the grantee. It has recently been decided, in the case of Lord Wensleydale, that a patent, expressly granting the dignity only for life, does not entile the holder to a seat in the House of Lords. When a baron is summoned to the House of Peers by writ of summons, the writ is in the name of the sovereign, who enjoins him to come to the parliament appointed to be held at a certain time and place, and there to advise with his sovereign, the prelates and nobles, about the weighty affairs of the nation. The ceremony of his admission into the House of Lords is thus: He is brought into the house between two peers of his own rank, who conduct him up to the lord chancellor, his rank, who contact him up to the ford chancehor, inspatent, or writ of summons, being carried by Garter king-at arms, who presents it to his lordship. The lord chancellor directs the same to be read, which, being done, the oaths are administered, and the peer takes his seat, from which he again rises, and returns to the changellor, who congretables him on heconing. the chancellor, who congratulates him on becoming a member of the House of Peers. The coronation robes of a baron differ from those of the other peers in having or a paron diner from those of the other peers in maxing but two rows of spots on the mantle, and the par-liamentary robes in having but two guards of white fur, with rows of gold lace. The right of wearing a coronet was first conferred on barons by Charles II. It is was not content of mators by Charles 1. It is adorned with six pearls, set at equal distances, of which four are usually shown. Barons are styled "right honourable," and addressed officially by the Crown as "right trusty and well-beloved." Their children enjoy the prefix of "honourable."

Baronage, bir -o-ndj, a collective noun, signifying the whole body of the barons; but used also in wider sense to comprise the whole of the poblitive

a wider sense, to comprise the whole of the nobility, without regard to the distinction of dukes, marquises, earls, viscoauts, and barons. It is used in this latter sense by Sir William Dugdale, in his able and learned work, "The Baronage of England" (1875-6); for an account of which see the English Encyclopadia—Arts

and Sciences.

BARON AND FEME (old Fr.), terms used in the old law books for husband and wife. (See Husband.)

BARON COURT. (See COURT BARON.)
BARON TO THE BARON, BARON THE BARON THE BARON.
BARONTT, bar'o-net, an English title of dignity, which properly signifies a little baron. It has been said, in the article BARON, that, in the reign of said, by the baron the greater with the learn the baron that the baron the greater with the learn the baron that the baron the greater with the learn the greater with the learn the baron the greater with the learn the greater with the learn the greater with the learn the greater with th and the lesser, the former of whom only were sum-moned in person to parliament. To the latter, or moned in person to parliament. To the latter, or lesser barons, we find the title of baronet frequently given; but it was not until the reign of James I. that the dignity was formed to which the title of baronet the dignty was formed to which the controlled in any plied. This monarch, being in want of money, hit upon the expedient of creating this new dignity, in 1911, and offered it to 200 gentlemen of good birth, possessing a clear estate of £1,000 a year, upon condition that each should pay into the royal exchequer, in three count instalments, a sum equivalent to three possessing a clear estate of £1,000 a year, upon condition that each should pay into the royal exchequer, in three equal instalments, a sum equivalent to three years' pay of thirty soldiers, at £d. a man per day, or about £1,035, the first instalment to be paid on delivery of the patent. The money was professedly for the purpose of settling and improving the province of Ulster, in Ireland, which had become vested in the crown by the attainder of its previous owners; and hence these baronets had the right of adding to their family arms those of that province, familiarly known as "the bloody hand." It was stipulated, on the part of the king, that the number of baronets should never exceed 200, and that, as the number was diminished by the extinction of families, or otherwise, no new creations should be made to supply their places. This stipulation has long been disregarded, and new baronets are created every year. It was also stipulated that ne hereditary dignity should ever be created to intervene between baronets and the peerage. Payment of money will no longer obtain the title; but the ancient form of the patent is still retained, as when money was given for it; and it is always accompanied

by a discharge from the Exchequer, as if the stipulated sum had actually been paid in. Baronets are entitled to the prefix of Sir, and the affix of Baronet; and their wives are styled Lady, Madam, or Dame, according to usage. The rank of baronet is the last of the hereditary usage. An exam of Datones is the last of the interest and titles; but a baronet has no robes, oxonote, or distinctive badge whatever, except in the case of Scottish baronets, who, in 1829, were granted the privilege of wearing an orange riband and badge. In 1819 the wearing an orange riband and badge. In 1619 the diguity of baronet was created in Ireland, upon the same terms as in England; and shortly before the death of Ling James, the plantation of the province of Nova Scotia, in North America, was assigned as a cause for extending the same offers to Scotland. The king didnot live to fulfil his intention; but Charles I., acoustier his accession, created the first baron of Nova Scotia. From the Union, in 1708, baronets created in England or Scotland heaven harveste of Great Britain. England or Scotland became baronets of Great Britain; and those created since 1800 are baronets of the United Kingdom. The only instance of a baronetcy being conferred upon a female occurs in the case of Dame Mary Bolles, of Ashurton, who, in 1635, received that dignity, with remainder to her heirs whatsoever.

Barons of the Cinque Ports were, previous to the passing of the Reform Bill, members of the House of Commons, elected by the five ports, two for each port. Formerly, the principal citizens of London were honoured with the title of baron, as were also the

mayors of Corfe Castle, in Devonshire.

BARONS OF THE EXCHEQUEE are the judges of the court of Exchequer, five in number, consisting of one chief and four puisne barons. Selden (Tit. of Hon., 2, 5, 16) conjectures that they were anciently made out of such as were barons of the kingdom, or parita-mentary burons, and thence to have derived their name; which conjecture receives great strength from Bracton's explanation of Magna Charta, c. 14, which Bracton's explanation of Magna Charta, c. 14, which directs that the earls and barons be americed by their peers; that is, says he, by the barons of the Exchequer,—Ref. Bract. 1. 3, tr. 2, c. 1, s. 3.

Barony, būr'-o-ne (Lat. baronia, or baronagium), is that honour and territory which gives title to a baron; comprehending not only the fees and lands of temporal

comprehending not only the fees and lands of temporal barons, but of bishops also, who have two estates,—one as they are spiritual persons, by reason of their spiritual revenues and promotions; the other grew from the bounty of our English kings, whereby they have baronies and lands added to their spiritual livings and preferments. Manors were formerly called baronies, as they still are lordships; and the manor court is still called Court Baron (which see).

Baroove, bar oak (Fr., rough, irregular), in Mus., is false and overcharged with modulation, while the intonation is forced and unnatural.

Baroscorz, bar-o-skope (Gr. baros, weight, skopeo, I perceive), a term sometimes applied to the barometer, but which ought strictly to be reserved for such an instrument as may show a change in the weight of the atmosphere without accurately indicating the pres-sure. The ordinary weather-glass, or wheel baro-meter, is, in accordance with this definition, merely a baroscope.

BARDSELENITE, bde'-o-sel'-e-nits (Gr. barus, heavy, selene, lustre), in Min., native sulphate of baryta, or heavy spar. It occurs in modified rhombic and rectangular prisms; also in compact granular or fibrous masses. It is much used, when ground, for adulterating white lead. It contains 66 parts of baryta and 34 of sulphuric acid.

BAROSMA, bör-os'-ma, in Bot., a gen. of plants belonging to the nat, ord, Rutacea. The leaves of several species, such as B. crenata, crenulata, and serratifolia, are used in medicine for their aromatic, stimulant, antispasmodic, and diurctic properties. They seem also to have a specific influence over the urinary organs. The plants yielding them are natives of the Cape of Good Hope. In commerce they are known as Buchu-loaves, and are thus named in the British Pharmacopoias. They con-tain a peculiar bitter principle called *Diosmin* or *Baros-*

mis, and a powerfully-scented volatile oil.

Baboucus, bar-ook (Fr.), a four-wheeled carriage, furnished with seats, as in a cosch, and provided with a top that can be raised or lowered at pleasure.

Harracan, barra-can (Ital. baracans), a sort of

## Barracks

thick strong stuff resembling camlet, but rather coarser in texture. It is used for making cloaks and other

in texture. It is used for making cloaks and other outer clothing.

BARRACKS, bir'-rik's (Bpan, barraca, a cabin or aut), a term in Mill, applied, in its modern meaning, to ranges of building erected for the reception and accommodation of large bodies of soldiers, including quarters for officers and men, officers' mess-rooms, guard-rooms, stables, hospitals, and various other requisite premises. It originally meant a rough wattled shad, hastiv not un for cavalry: those of a similar questive premises. It originally meant a rough watered shed, hastily put up for cavalry; those of a similar construction designed for infantry being called huts. During the Crimeau war the French and English troops wintered in huts of this description. Formerly soldiers were billeted on public-houses and the resi dences of private families; and few barracks, in the modern acceptation of the word, existed prior to the year 1782, when the ministry then in power wrung a reductant consent from parliament to erect barracks for the soldiery in and near many important towns and cities, which was carried into effect in subsequent years, under the superintendence of Lieut.-General De Laucy, as barrackmaster-general, with a staff of subordinate officers. The office of barrackmastergeneral was soon abolished; and the duke of Welling-ton, when commander in chief of the forces, about 1820, placed the barracks under the management of the Board of Ordnance, making an officer, known as the resident barrack-master, responsible for the care of the buildings, and all articles issued from the barrackoffice for each soldier's use,-consisting of an iron bedstead, paillasse, bolster, rug, two blankets, and a pair of sheets,—and furniture and utensils necessary for each separate mess or barrack-room, which is under the charge of a sergeant or corporal, and is inspected by a lieutenant or ensign daily. When the Board of Ordnance was broken up in 1855, the barrack department of the service was placed under the direct control of the War-office, the Royal Engineers having to take charge of the buildings, and to see that all necessary repairs are efficiently executed. necessary repairs are efficiently executed. Among the improvements in the condition of soldiers in barracks, effected in consequence of the royal commission in 1887, under the presidency of Lord Herbert of Lea (then Mr. Sidney Herbert), may be mentioned the extension of the number of cubic feet of space allotted to each soldier, varying from 600 to 1,000 feet, as in the new cavalry barracks at Aldershot (see CAMP AT AL-DESSHOT), and 1,200 feet in hospitals. Subaltern officers are allowed a room each, two sharing an apartment between them in former times; staff-sergeants and married sergeants have a room each; unmarried sergeants a room between two; about twelve or twent; four privates are placed in each barrack-room, according to size; married men are placed in separate quarters, and sergeants are allowed a separate mess-room. Great care is taken that the rooms shall be properly ventilated, and the provisions well cooked. Attention is also paid to the establishment of bathrooms, reading rooms, libraries, lecture-rooms, racket and tennis-courts, and other things necessary for the soldier's health, instruction, and smusement, which may tend to elevate his social condition, and gradually wean him from the debasing influences of drink and wesn him from the debasing influences of drink and other temptations that he is, generally speaking, too prope to yield to when leading a comparatively idle life in times of peace. The expense for building and repairing barracks in the United Kingdom of Great Britain and Ircland since 1793 is very nearly as follows:

—From 1703 to 1804, £4,115,000; from 1804 to 1819, £3,221,000; and from 1819 to 1862, about £6,000,000; giving a total of about £15,336,000. It has been ascertained that the cost per man in the erection of different harrack has varied as much as from £30 to different barracks has varied as much as from £30 to

All according to the manner in which they were built.—Ref. English Cyclopadia—Arts and Sciences.

BARRACCON. bir ra-koon, a station or depot on the soast of Africa, where captured slaves are collected together and guarded until they are removed by the traders in their vessels.

BARRATEY, bar-ra-tre (Old Fr. borat, from which is still retained barateur, a cheat; from the Dano-Norman baret, in Law, is the offence of frequently fronting and sturing up suits and quarrels between the Mejerty's subjects, either at law or otherwise; the

#### Rarrian

punishment for which is fine and imprisonment marine insurance, barratry is where the master of the ship or the mariners defraud the owners or insurers, whether by running sway with the ship, sinking her, unlawfully deserting her, or embezzling the cargo. To the offence of barratry may be referred another offence of equal malignity and audaciousness—that of swing another in the name of a fictitious plaintiff, either one not in being stall, or one who is ignorant of the suit. If the offence be committed in any of the superior courts, it is considered a high contempt, and punishable at the discretion of the court. In courts of a lower degree, it was by 8 Eliz. c. 2, s. 4, directed to be punished by six months' imprisonment, and treble damages to the party injured. (See also CHAMPERTY, MAINTENANCE.)

BARREL, bar'-rel (Fr. baril; Sp. barril), in Com., a HARRE, bar-yel (Fr. baril; Sp. barril), in Com., a measure of capacity; also the name of a versiol principally containing ale or beer. The barrel has more length than breadth, with a bulging in the middle, and is made of staves and headings, and bound with boops. In the metropolis, a barrel of beer formerly held 22 sie or 32½ imperial gallons. It was, however, enacted by 43 Groc. III. c. 69, that a barrel of beer should consist of 36 gallons. By a later envertuent it was accelly 3 (rec. 111. c. os., that a party of oper mount consist of 36 gallons. By a later enactment, it was decided that whenever any gallon measure is mentioned in any excise law, it should always be deemed and taken to mean an imperial gallon. Consequently, the barrel signifies, at the present time, 36 imperial

gallons.

Barrel, Gun. (See Gun-Barrel.)
Barren Iand, bör-ren (Sax. bare), in Agr., a term applied to soil in which trees, plants, or grasses of any kind cannot attain perfection, from a deficiency of any kind cannot attain perfection, from a denoting of the proper constituents necessary to their development and growth. When sterility arises from lightness of soil or an undue proportion of sand in the composition of the ground, it may be removed by proper irrigation and the addition of heavy earth, mixed with rich loamy soil. In heavy clay lands, on the contrary, the soil must be well drained and lightened by the admixture of sand, lime, and decayed animal and vegetable matter. The acid properties of some soils, which produce coarse rank grass, sedge, and rushes, and the presence of metals, such as sulphur and the peroxide and protoxide of iron, in too great quantities, in combination with acids, are most readily corrected by the use of lime, which is also bereficial in removing the tannin, an injurious element in the composition of soils of an astringent nature, such as peat lands, consisting of vegetable substance, the decay and change of which of regetable substance, the decay and change of which into loam is prevented by the astringent element just mentioned. The want of many mineral substances in substances in the britant with the substances in Barricant, birri-kaid' (Fr.), in Mil., a term employed to distinguish the temporary defences raised in order to obstruct the attacks of an enemy in the field.

It is still more generally employed to denote the deit is still more generally employed to denote the de-fences thrown up in towns during a time of revolution or insurrection. At such times barricades are com-posed of whatever substances are nearest at hand; carts filled with stones, buskets of earth, household furniture, and bales of wool or cotton, have all been employed for this purpose. During most of the revo-lutions in Paris; the populace have made barricades by raising up and pilling together the paving-stones of the streets. The present emperor. however. has. the streets. The present emperor, however, has, during his reign, caused all the principal streets to be macadamized, and all the footpaths to be made of sphalte. The term barricade is occasionally applied to the barriers which defend a fortress.

BARRICADE, in Mar., a term denoting a strong wooden rail, supported by stauchions, which extend across the foremost part of the quarter-deck. The upper part contains a double rope netting above the rail, and is stuffed full with hummocks-gible spaces between the stanchions being filled with pieces of cork. old cables, mats, &c., to prevent the execution of amail shot during a navel engagement.

BARBICARRI SKEDS, blar -is, the produce of the Adenuathera pavonia, a leguminous plant. They are of

Adenuathera paronia, a leguminous plant. They are of a bright red colour, and are employed in the northern parts of South America at beads for making neck-

BARRIER, bar'-ri-er (Fr. barrière), in Fortification, a piece of woodwork or fence, which presents an ob-

#### Barrier Act

stacle to passing through any estrance where it is fixed stacle to passing through any satrance where it is liked. Barriers of this kind are generally composed of great stakes four or five feet high, placed at a distance of eight or ten feet from each other, with transoms or overthwart rafters. Their purpose is to prevent the entrence to any passage or intrenchment of horse or foot. In the middle is a movable gar, which can be opened or shut as required. The term barrier is also used to signify a fortification or strongly-guarded place on the frontiers of a country. The barrier fortresses of Flanders are instances.

of Flanders are instances.

Barrier Act is the name given to an act of the General Assembly of the Church of Scotland, passed in 1997, to prevent the too hasty adoption of any important measure. The proposal of any alteration in the rules or constitution of the church must first be brought before the General Assembly in the form of prougnt. perors the General Assembly in the form of an overture, when, if approved of, it is then transmitted to the several presbyteries for their consideration, with injunctions to forward their opinions to the next General Assembly, by which it may be passed into law only if it have obtained the concurrence of the majority of the presbyteries.

of the presbyteries.

BARKIER ERF, a name given to any coral reef which runs parallel to the shore, but separated therefrom by a channel. The great barrier reef along the northeast coast of Australia is composed of a chain of huge masses of coral rock, and is more than 1,000 miles long and from 10 to 90 miles in width. (See Coral Reff.)

BARKIER TERATY is the name given to a treaty entered into between the Dutch and the emperor of Germany in 1716, shortly after the peace of Utrecht. In terms of this treaty, Austria received possession of all the provinces which had belonged to Spain, with the addition of the greater part of the places taken during the war with France. A large force, consisting of not less than 30,000 men, was to be maintained in the country, whereof the emperor was to furnish the country, whereof the emperor was to furnish three-fifths, and the States the remainder. The annual sum of 500,000 crowns was to be paid by the emperor towards the payment of the Dutch troops; and he solemnly engaged not to transfer these provinces to a prince of the house of Bourbon, either by sale, mar-

riage, or otherwise.

BARRING-OUT, bar'-ring, a practice, which was of frequent occurrence in schools in former times, of securing the doors and windows of the school-room, when a suitable opportunity presented itself, against the entrance of the head master and his assistants. It was generally done a short time before the vacations, to secure some additional holidays, or to obtain the re-moval of some fancied wrong. The boys national to moval of some fancied wrong. The boys native to lay in a store of estables to sustain themselves during lay in a store of estables to sustain themselves curing the siege, and obtained their demands if they were able to prevent the master from effecting a forcible entrance within three days. It is said of Addison, that he managed a barring-out when a boy of twelve years of age at school at Lichfield. At a barring-out at the High School, Edinburgh, in 1595, fatal reensued; one of the city magistrates, under whose ensued; one of the city magnitudes, under whose patronage the school happened to be, being shot dead by one of the boys, in an attempt on the part of the authorities to force an entrance. Sir John Deane, founder of Witton school, Cheshire, ordered the pupils to observe the custom twice a year,—a week before Christmas and Easter.—Ref. Brand's Popular Antiquities. Chemberg's Equalization

Christmas and Easter.—Ref. Brand's Popular Antiquities: Chamber's Encyclopedia.

BARRINGTONIA, bar-ring-to'ni-a (in honour of the Hon. Daines Barrington), in Bot., the typical gen. of the nat. ord. Barringtoniacea, consisting of small trees conspicuous for their beauty. B. speciesa, the Moordilla, a native of Ceylon, has dark glossy leaves, and white flowers delicately tinted with crimson. Sir Fmerson Tennent says that the stamens, of which there are nearly a hundred to each flower, when they fall to the ground, might almost be mistaken for nainters' trushes.

painters' brushes.

painters' brushes.

BARRINGTONIACER, bir'-ring-to'-ni-ri'-se-s, in Bot., a small nat. ord. of dicotyledonous plants, in the subclass Calgrifors. They are usually placed among the Myrtaces, which they resumble in most essential particulars. The species are all natives of tropical regions, and most of them have poisonous properties. The bark of Strandium racemosum is said to be febringal; the fruit of Carcya arbores is edible; while that of 313

### Barrow

Gustava braziliana is emetic, and produces an intextcating effect upon fish.

BARRISTER, bar'-ris-ter (from bar, or barr, and Old BLRUSTER, bar-rister (from bar, or barr, and Cld Fr. ester, to remain or continue: thus the combination of the two forms, barrester, one who takes his station at a bar; who continues there, that is, who carries on his profession at the bar; a pleader of causes).— Barristers were first styled apprentices (apprentices at legem), from Fr. apprendre, to learn, who answered to the bachelors of the universities, as the state and decree of a seriestal farmients and learns. the state and degree of a serjeant (servientes ad legem) did to that of doctor. Apprentices or barriers as agenty did to that of doctor. Apprentices or barriers esem to have been first appointed by an ordinance of King Edward I., in parliament, in the 20th year of his reign. (Spelm. Gloss. 37; Dugdale, Orig. Jurid. 55.) The time before they ought to be called to the bar, by the ancient orders, was eight years (afterwards reduced to five) and the exercises done by them (if they were not called ex gratia) were twelve grand moots, performed in the inns of chancery, in the time of the grand readings; and twenty-four petty moots, in term time, before the readers of the respective inns of court. The privilege of conferring the rank or degree of barristerat-law is exclusively enjoyed by the inns of court, which are the Inner Temple, the Middle Temple, Lincoln's Inn, and Gray's Inn. The possession of this rank (or of the higher degree of serjeant) constitutes an indispensable qualification for practising as an advocate in the superior courts at Westminster. No other means of obtaining it exist but that of becoming enrolled as a of obtaining it exist but that of becoming enrolled as a student in one or the other of these inns, and apply-ing, after a certain period, to its principal officers (or benchers) for a call to the bar. As a qualification for a call, the student must have kept commons for three years (i. s. twelve terms), by dining in the hall of the society at least three times in each term; and it is further required by the society of Liacoin's Inn that he should have been a member for five years, unless he have taken the degree of meater of strice repetitions. he should have been a member for any year, aness he have taken the degree of master of arts or bachelor of law in the universities of Cambridge, Oxford, or Dublin, or unless he shall apply to be examined in law, and pass a sufficient examination therein, in which case three will be sufficient. The benchers have the power of conferring the honorary degree of barrister on whom they will, without these requirements, as in the case of the present Prince of Wales, who was lately called to the bar by the society of the Middle Temple. The qualifica-tion above alluded to involves nothing of academical discipline or institution, nor is it necessary for the applicant for a call to the bar to be subjected to any previous examination as to his professional knowledge. But lately, leging have been instituted, and an annual (optional) examination in law and high degrees of scademical learning established, of students proposed for the bar, with prizes and certificates for the most distinguished. The business of legal education has been long conducted in private channels, a method which experience has proved to be efficacious; the usual plan being to obtain admission into the chambers of a practising barrister, conveyancer, or special pleader, where, in addition to the opportunities of observing the course of practice, the pupil enjoys for some time the advantage of tuition in the grounds and principles of the law. As to the privilege of barristers from arrest, see Alexen: and as

privilege of barristars from arrest, see Arrest; and as to their duties and general privileges, see Coursel.

Barrow, bar-ro (Sax. bereice), in Archæol., a name given to large artificial mounds of earth ruised over the graves of warriors and men of renown in bygone ages. There are many barrows in Great Britain, particularly in Wiltshire and Dorsetshire. Some of these have been explored, and human remains have been discovered in them, deposited in a rough stone coffin, or, in cases where the body had been previously burnt, in a sepulchral urn made of clay. Fint stone conin, or, in cases where the body had osen previously burnt, in a sepulchral urn made of clay. Find arrow-heads, weapons of brass and iron, coins, bracelets, and cups, have also been found in them. The barrow called Silbury Hill, near Marlborough, in Wiltshire, is one of the largest in this country, being about 170 feet in height, and covering an area of nearly six acres. When barrows of this enormous size were reised, it is probable that they were intended to common the same great battle, or other important event. memorate some great battle or other important event, and must be considered as serving a monumental purpose, for which we should use an obelisk or column in the present day.

## Barry

Barry, bur'ere, in Herr, when the shield is divided by horizontal lines into more than five equal parts, it is described as barry of so many pieces as there are divisions. The field of a shield is described as barry-bendy when it is divided evenly into lozenge-shaped pieces by the intersection of transverse and diagonal lines; and barry-pily when it is divided by diagonal lines from left to right and right to left, into pieces of the form of a wedge. the form of a wedge.

Bars, bors, in the menage, are the upper part of the gems, between the tusks and grinders, which bear no teeth, and to which the bit is applied, and by its fric-

BALER, bar-ter (Sp. baratar), in Com., is the ex-chasging of one commodity directly for another, with-out the employment of mosey or any other medium of exchange. This is the usual mode of exchange among savage or uncivilized races, and it is likewise generally adopted by civilized nations in trading with savages; thus the traders with the North-American Indians purchaseskins by bartering guns, powder, axes, and such-like. The term seems to be derived from the Italian word barattare, which signifies to cheat as well as to barter. A system of barter can only exist in the earliest commercial state of a people; for as commercial intercourse extends, the necessity of a standard of value becomes apparent, not only to facilitate operations, but to prevent that species of over-reaching which necessarily attends barter. The exchanges of a civilized people amongst themselves, or with other countries, are principally carried on by means of bills of exchange, so cipally carried on by means of bills of exchange, so that the actual money payment in a country by no means represents the amount of its commercial transactions. In some parts of England, particularly in the mining districts, wages are paid in articles of communition instead of money; and this is termed "trucking," from the French word troe, which signifies barter. It is, however, illegal.

Barracionwe Fair, har-thol-o-mu, was first held in the year 1133, and was conducted by the monks and

the year 1133, and was conducted by the monks and priests of the church and priory of St. Bartholomew, which was situated in West Smithfield. The first charter was granted to a monk named Rayere, who had been jester to Henry I. In addition to the usual buybeen jester to Henry I. In addition to the usual buy-ing and selling, the fair was distinguished by the miracle-plays and mysteries of the priests, by athletic sports and games, and by the public disputstions of the scholars from the London schools. In the middle of the 15th century the fair had greatly increased, and had become an important market for cattle, cloth-stuffs, leather, &c. It was always held on the 24th angust, St. Bartholomew's day, and the variety of exhibitions, booths, mountebanks, and theatrical performances, made the gathering very popular. Henry VIII. sup-pressed the priory of St. Burtholomew, and the charter was then transferred to the corporation of London. After that time the fair began to lose its character, and towards the close of the 18th century a row of houses was built on the site of the cloth fair. The name is retained still. In 1503, the year of the great plague, the fair was not held. The proceedings usually lasted three days; but after the restoration of Charles II. they were prolonged to fourteen days. In 1701, however, the fair was represented as a nuisance; and the traffic gradually lessened from that period : it became an annual exhibition of debauchery and dissipation. Many unsuccessful attempts were made to suppress it, but it was not until 1840 that it was removed to Islington, where it struggled feebly for existence. It was finally abolished in 1855.

BARTHOLOURW'S DAY, a feetival of the Church, observed on the 24th of August, in honour of St

Bartholomew.

Bartholomew. Sr., MASSACES or, an atrocious carnage that took place in France, on the night of St. Barthalomew's day, 1572. The king, Charles IX., at the instigation of his mother, Catherine de Medicis. The queen dowager, invited to Paris, under a solemn such of safety, the principal Protestants of the kingdom in order to celebrate the marriage of the king of Navarravith the sister of the French king. On a given signal at midnight, the massacre sommenced; men, women and children were involved in one common destruction. The nits reasonable with the growns of the driver, the The city resounded with the grouns of the dying; the

dead bodies were cast into the streets, and the channels flowed with blood. In Paris alone, it is said that more than 10,000 persons were put to death on that night. But the butchery was not confined to Paris: at Orleans, Rouen, Meaux, and other places throughout France, similar cruelties were perpetrated; so that in all, according to Sully (whose account is the received one), 70,000 persons were massacred on this occasion.

BARHOLOMYRES, bar-thol'-o-mites, a religious order founded at Genoa in 1307, but suppressed by Popo Innocent X. in 1650, in consequence of the irregularities of the monks. In the church of the monastery of this

order, at Genoa, is the image pretended to have been sent by Christ to King Abgarus.

BARTIZAN, bar-ti.xam, in Mediaval Arch., a small round turret, with an arrow-slit or very narrow window, generally projecting from the angle of a square tower, on the corner of a gable of a building, and supported on a corbel or bracket. Its chief use when thrown out near the top of a tower seems to have been for the near the top of a tower seems to have been for the purpose of enabling any one on guard to keep a look-out on persons approaching the eastle, from a place of shelter and safety; or, when placed over or near a gateway, for defensive purposes.

Barron Erbs, bar-ton, in Geol., a group of tertiary beds, included in the Bagshot series. They consist of greenish-grey sandy clay below, massing up into bluish-green and brown clay, interstratified occasionally with heds of sand and loam.

hede of sand and loam.

BARU. (See SAGUERUS.)

BARUCH, THE PROPHECT OF, bair-uk, is the name of one of the apocryphal books subjoined to the canon of the Old Testament. Baruch was the disciple and amanuesis of the prophet Jeremiah, and this book has been reckoned part of Jeremiah is prophety, and in often cited by the ancient fathers as such. It is said, in the preface to the book, to have been written by Barnch at Babylon, by the appointment of the king and the Jews, and in their name; that it was after-wards read to them for their approbation, and then sent to Jerusalem, with a collection of money, to Joa-chim the high priest, and to all the people. The Jews sent to Jerusalem, with a collection of money, to Jon-chim, the high priest, and to all the people. The Jews rejected this book, because it did not appear to have been written in Hebrew; nor is it in the catalogue of sacred books given us by Origen, Hilary, Rufinus, and others. St. Cyril of Jerusalem, however, and the Lao-dicean council, held in 364. mention Baruch among the dicean council, held in 302. mention Barden among the canonical books of Scripture, and join it with the pro-phecy of Jeremiah. There are three ancient copies of this book extant,—one in Greek, the other two in Syriac; but in which of these languages, or whether in-may of them, it was originally written, is uncertain. Barwoor. (See Barhia.)

BARYSTRONTIANITE, bar-i-stron'-shaw-ite, in Min., a mineral found in Orkney, containing a mixture of carbonate of strontia and sulphate of baryts. It is

also known as Stromnite.

BARYTA, or BARYTHS, ba-ri'-ta (Gr. barus, heavy), in Chem., one of the alkaline earths, discovered by Schoole, in 1774. It is met with, combined with sulphurie acid, in cank or keavy spar, and combined with carbonic neidin witherite. It may be formed by decomposing the nitrate by a red heat. It is now similar in the second heat. by a red heat. It is very similar in its properties to caustic lime. It is greyish-white; becomes not when caustic lime. It is greyish-white; becomes hot when moistened with water, falling to a fine white powder, forming the hydrate. Its specific gravity is about 4. It has an extremely acrid caustic taste, and is very poisonous. It dissolves in 20 parts of water, forming baryta-water, much used as a chemical reagent. Boiling water dissolves half its weight of baryta, and deposes, on cooling, four- or six-aided prismatic stystals, containing 10 equivalents of water

BARTA, CARBONATE OF, found native as seitherite. It is used as the source of many baryta salts. It is a dense white powder, falling as a precipitate when a soluble carbonate is added to a solution of baryta salt.

solution carrotted is acrea to a solution of contract and it is nearly insoluble in water, but dissolves readily in sectic, nitric, hydrochloric, and several other acids.

BARYTA, NITATE OF, in Chem., formed by dissolving the carbonate of baryts in very dilute sitrio acid, and evaporating and crystallizing. It forms white, transcurporating and crystallizing. It forms white, trans-lucent octahedra, which are subydrous. It is soluble in 8 parts of cold and 3 parts of boiling water. It is used principally in the preparation of baryts for che-mical purposes, and for detecting acids in analysis.

#### Parvie

BARYTA, THE SANTS OF, are readily recognized by giving a dense white precipitate, insoluble in the acids on the addition of a soluble sulphate. The carbonate and all the soluble salts are powerful acrid The best antidote is sulphate of sods or poisons. The salts not enumerated above are unimportant.

BARYTA, SULPRATE OF, found native in the form of heavy spar. It may be readily formed by adding a soluble sulphate to a seluble sait of baryta. It is a dense white powder, insoluble in soids, and is some times used as a pigment, under the name of permanent white. Sulphate of baryts, or heavy spar, found in the lead-mines of the North of England, is the source of most of the baryts salts. The insolubility of sulphate of baryts, in acids renders, the salts of baryts valuable tests for the presence of sulphuric acid in any compound.

BARYTO-CALCITE, ba-ri'-to-kal'-site, in Min., a mineral containing carbonate of baryta and carbonate of lime; also called Alstonite, from being found in the lead-

mines of Alstone Moor.

BARTANE, or BABITOWE, bar'-i-tone (Gr. barus, heavy, and tones, tone), in Mus., a tone of the voice the compass of which lies between the bass and tenor. It is the lowest but one of the six registers into which the human voice is divided, and is the commonest kind

the human voice is divided, and is the commonest kind of male voice. The mezzo-soprano, or middle female voice, corresponds with it an octave higher.

Basatt, ba-soll (frem basal, an Ethiopian word for iron), in Geol., a close-grained, hard, black, or dark-brown rock, of igneous origin, occurring both in the Trap and the Volcanic series. It is one of the Dolerites or Augitic lavas, and consists essentially of augite and felspar, the former being in excess. often contains crystals of the olive-green mineral olimne, grains of magnetic iron, and other bodies.
Masses of basalt are frequently found divided into columns or prisms, with three, five, or more sides.
That this columnar structure is the result of contractions. tion on consolidation, is shown by the prisms usually being at right angles to the greatest extension of the raise, that is to say, being vertical in an horizontal bed, and horizontal in a vertical dyke,—proving that the ilssuring commenced at the cooling surfaces, and struck thence directly towards the centre of the mass. Sometimes it is found that the two sets of prisms thus originating at each surface did not exactly fit when they met in the centre. At other times, however, the prisms proceed uniquerruptedly from side to side, the two sets either haring coalesced, or one surface having cooled before the other, and given rise to divisite any were carried right across the mass. In addition to these prismatic joints, other irregular joints, more or less nearly at right angles to the prisms, also occur; and in very regular columnar basalt the columns are articulated, or separated at regular or irregular inter-vals, into short blocks, by divisions, which are some-times quite flat, and sometimes curved into concave and convex surfaces, forming an approach to the ball-and-socket joint. The origin of this structure is explained by the celebrated observations of Gregory Watt. If a mass of basalt by melted in a furnace and allowed to cool again, the following results are observed:—If a small part be removed and allowed to cool quickly, a kind of slag-like glass is obtained, not differing in ap-pearance from obsidian: if it cool in larger mass, and more slowly, it returns to its original stony state. During the cooling, small globules make their appearance, which increase by the successive formation of external concentric coats, like those of an onion; and the simultaneous obliteration of the previously-formed internal coats, so that, ultimately, a number of solid balls are formed. As these balls continue to increuse in size, their external coats at length touch, and then they mutually compress each other. Now in a layer of equal-sized balls, each ball is touched by exactly six others, and if all be squeezed together by an equal force acting in every direction, each ball will necessarily be converted into a regular hexagon. The same result will also follow from an equal expansive force acting from the centre of each ball, or from the tendency to indefinite enlargement in their concentric coats. Thus could spheroidal mass, under favourable circumstances, will assume the form of a short hexagonal pillar.

#### Base Fee

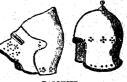
there are many layers of balls, each ball resting directly and centrically on the one below it, a long column of these hexagonal joints will be formed, and the top and bottom of each joint will be flat, conver, or concave, according to variations in the amount and direction of the pressure at the ends of the columns. There is no apparent reason why, in a cooling mass of basalt, the halis should be arranged so that their centres should be in straight lines, and that the hexagonal joints should form straight continuous pillers, rather than separate discontinuous parements. This, however, is probably the result of the simultaneous tendency of the mass to split into prisms on consolidation. The pillers of basalt are usually from six to eighteen inches in diameter, and vary in length from five or six to 100 or 150 feet. Basalt is rarely, if ever, found as an underlying rock, but generally occurs as a dyke or as an overlying mass. The most celebrated plateau of basalt is that in the north-east of Ireland, covering almost the whole county of Antrim. This entire mass 1200 and 50 miles long by 30 joints should form straight continuous pillars, rather almost the whole county of Antrim. This entire mass is 300 or 400 feet in thickness, and 50 miles long by 50 wide. The basalt occurs in three or four sheets, in many places beautifully columnar, and interstratified with beds of volcanic ash, or "ochre," as it is called. One of the columnar beds dips gradually into the sea on the north coast, and is known as the Giant's Cause-The basalt of the West of Scotland is very remarkable for the beauty and regularity of its columns. At Fingal's Cave, in the island of Staffa, the arrangement of these basaltic columns was long regarded as the masonry of a race of giants .- Rej

regarded as masonry of a race of giants.—Lef. Jukes's Manual of Geology.

BASANITE, bits'-d-mite (Gr. basanos), a species of schistose hornblende, used for testing the purity of gold. The gold is rubbed on the stone, and the mark is touched with aquafortis. The amount of copper con-tained in the gold may be easily guessed at by the

change of colour the streak undergoes.

BASCINET, BASINET, OF BASNET, bass'-i-net, a light helmet sometimes having a but more often without one, and basin - shaped, whence the name. During the reigns of Edward II. and Edward III. it was the common form of defensive



BASCINET.

Hasciner.

All the state of the placed, consisting generally, in the five orders of architecture, of a square plinth and mouldings, formed of tori, fillets, cavettos, and astragals, in various combi-nations, between the plinth and the bottom of the shaft. The height of the whole base, including plinth and mouldings, is about half the diameter of the shaft at its lowest or broadest end. The Greek Doric column is the only form of pillar that has no base. In Gothic architecture, the base became higher and more varied in form than in examples of orders of the classic

Base, in Chem., a term applied to those bodies which unite with acids or halogens to form salts or bodies analogous thereto. The basic property of an element is not absolute, but only relative; as the same body may act as a base or an acid with a different element. Thus we find chromium acting as a base in the form of sesquioxide, but as an acid in the form of teroxide or chromic acid. The bases in inorganic chemistry are generally oxides, the organic bases being analogous to them. (See ORGANIC BASES.) (For the relative busic

relations of bodies, see AFFINITY.)

BASE, in Fort., the exterior side of the polygon, or that imaginary line which is drawn from the flanked angle of a bastion to the angle opposite to it.

Base, in Mus. (See Bass.)

Base Court (Fr. cour basse) is any inferior court that is not of record; as the Court Baron, &c.—Ref.

Kitch, fol. 96, 96.

Base Fer, is one of the three kinds of estates in fee-simple, and has a qualification subjoined thereto, which

must be determined whenever the qualification annexed to it is at an end. As in the case of a grant to A and his heirs, tenants of the manor of Dule, in this instance, whenever the heirs of A cesse to be tenants of that manor, the grant is entirely defeated; so, when Henry YI. granted to John Talbot, lord of the manor of Kingston-Lisle, in Berks, that he and his heirs, lords of Kingston-Lisle, in Berks, that he and his heirs, lords of the said manor, should be peers of the realm, by the title of barons of Lisle, here John Talbot had a base or qualified fee in that dignity (Co. Litt., 27 a); and the instant he or his heirs quitted the seignory of this manor his dignity was at an end. The estate is a fee-simple because it is limited to the heirs general, and may by possibility endure for ever; yet, as that duration depends upon the concurrence of collateral circumstances which qualify the duration, it is, therefore, not an absolute, but a qualified or base fee. It is proper to observe, with respect to this term of base fee, that it has usually a more restricted application, viz., to that species of qualified fee which is created where a tenant in tail conveys his estate by bargain and sale. a tenant in tail conveys his estate by bargain and sale, &c., and which Lord Coke describes as a determinable fee derived out of an estate tail; and in the act for abolition of fines and recoveries, 3 & 4 Will. IV. c. 74, its meaning is, by express provision, confined (so far as that act is concerned) to the estate created by the adienation of the tenant in tail where the issue are barred, but those in remainder or reversion are not. Base KNIGHTS, an order of knights inferior to barons and bannerets.

BASE-LINE, in Persp., is a line drawn at the extremity of the principal visual ray, and perpendicular to it. The base-line, in Surveying, is a principal line measured with the greatest precision on which a tri-angle or a series of triangles may be constructed,

BASE OF A SOLID FIGURE is its lowest plain side, or that on which it stands; and if the solid has two opposite parallel plain sides, and one of them is the base, then the other is also called the base. Base of a triangle, or any other plain figure, is usually that which lies the lowest; but any side may be the base, according to the position in which it may be conceived to be lying or standing.

BASE SERVICES, under the feudal system, were such as were fit only for pensants or persons of a servile rank; as to plough the lord's land, to make his hedges,

Page ; is to prough the lord stand, to make in steeges, to carry his manner, or other mean employments.

Basel, Council or, bal, is the name given to an important ecclesisatical council held in the city of Basel, in Switzerland. It was summoned by Pope Martin V. and his successor Engenius IV., in conformity to a decree of the council of Constance, and met on December 14, 1431, under the presidency of the cardinal-legate Julian Cesarini. The two great objects of the council were the reconciliation of the Hussites to the Roman Catholic church, and the re-formation of abuses in the Church itself; and the council was opened with an eloquent speech by the president. The former of these objects was contrary to the wish of the pope, who soon after issued his built for the dissolution of the council. The members, however, maintained that the pope had no power of dissolving a general council once lawfully convoked and assembled, and, on his continuing to issue bulls against them, they summoned Eugenius to appear at their bar. Notwithstanding the papeal bulls, the souncil concluded a peace in the name of the Church souncil concluded a peace in the name of the Church with the Hussites, to whom they allowed the use of the cup in the Lord's Supper. Through the intercession of the emperor Sigismund, a reconciliation was effected between the council and the pope, the latter revoking the bulls which he had issued against the council, and gave forth another, dated Docember 15, 1433, solemnly ratifying all its decrees. The council next proceeded to the reformation of abuses in the Church. The powers of the revoking ware much dismissed and his resumes

Savoy, under the name of Felix V., in his room. Many of the members had by this time withdrawn from the council, and these proceedings were generally dis-approved of by the Catholic world. The assembly, how-ever, went on to hold its sessions at Basel for five ever, went on to hold its sessions at Basel for five years longer. Its last session there was held in May, 1443. Subsequently, it continued to meet at Lausanue till 1449, when, after the death of Eugenius and the resignation of Felix, an amnesty was offered to thou by the new pope, Nicholas V., which they gladly accepted, and declared the council at an end. The decrees of the council of Basel are not admitted from any of the Ruyan collections, and are considered from any of the Roman collections, and are considered of no authority by the Roman lawyers. They are, however, recognized in points of canon law in France and Ger-many; and though some later concordats have modified the application of them, they have never been formally

the application of them, usey hard according to and entirely annulled.

BASEL, TREATIES OF, the name given to two important treaties of peace concluded at Basel on the Stapril and 22nd July, 1795: the former of these was between France and Prussis, the latter between France and Prussis, the latter between France and Prussis, and Spanja withdraw them. and Spain, by which Prussia and Spain withdrew them-selves from the coalition against France, and acknow-

selves from the coamon against rance, and acknow-ledged the republic. Prussis gave up to France all her possessions beyond the Rhine, while Spain ceded her portion of the island of San Domingo.

BASELLACEE, bis-et-lai-se-e (from basella, its Malabar name), in Bot., the Bueella family, a small nat. ord. of dicetyledonous plunts, in the subclass Monochlamydes. They are climbing herbs or the basella ship of the coards allied to Chemodicant ship to the property and the coards. class Monochlumydes. They are climbing herbs or shrubs, closely allied to Chenopodiaces (which see), but readily distinguished by having a coloured calyx, with two rows of sepais and perignous stamens. There are four genera and twelve species, all of which are tropical plants. Busella rubra and alba are used in the East Indies as substitutes for spinach. From the former species a purple dye may be obtained. The fleshy roots of Ullucus tuberosus, or Melloca tuberosa, a native of Peru, contain a great deal of starch, and are edible.

BASEMENT, baiss'-ment (Ang.-Nor.), in Arch., the lowest story of any building, generally sunk beneath the surface of the ground, in private houses containing the kitchens and cellars. In public buildings of any architec-tural pretensions the base is, for the most part, low and of massive appearance, formed of "rusticated" masonry or stones, the outer surface of which is hewn into a rugged indented form, with a projecting band above, or cornice, which serves as a support to pilasters running up the walls of the building between the windows, a Traiteball, London. There is no strict rule for the height of the busement story; but it is generally regulated by the purposes for which it is intended, and the various uses to which the ground-floor above is applied.

BASHAW, BASHA, or PASHA, ba-shaw' (Arab. basha, head or master), a Turkish title of honour conferred on vicerors, provincial governors, and other distinguished men. The badge of a bashaw's authority, as well as the emblem of his rank, is the horse-tail, and he takes precedence according to the number of these on his banner: the highest is the bashaw of three tails. These bashaws exercise supreme civil and military authority in their respective provinces, and many of them owe little more than a nominal subjection to the

BASHI-BAZOUKS, ba'-she-ba-rooks', are icregular cavalry troops in the Turkish service. In the late war in the Crimes they were frequently engaged with the enemy; but they were turbulent and insubordinate. and plundered whenever occasion offered, so that they and plundered whenever occasion offered, so that they were generally more troublesome to their friends than to the enemy. W. H. Russell, in describing these "wild cavaliers," says, "it would have been difficult to find more picturesque-looking scoundrels if the world was picked for them from Scinde to Mexico. Many of them were splendid-looking fellows, with fine sinewy legs, beautifully-proportioned muscular arms, and noble well-set heads of the true Caucasian mould; others were hideous negroes from Nubia, or lean more others were hideous negroes from Nubia, or lean more than the state of the true of the state of the stat to the reformation of abuses in the Church. The powers of the pope were much diminished and his revenues cartailed, and punishments were appointed for certain cartailed, and punishments were appointed for certain moralities of the clergy. These proceedings greatly exasperated Eugenius, who summoned another council at Ferrars, and issued a bull for the dissolution of that at Ferrars, and issued a bull for the dissolution of that at Region in the population of the control of the cont

BASIL. (See OCYMUM.) BASIL. (See DOYMUR.)

BASILIAN MONES, be-silv-t-iss, in Eccl. Hist., were monks of the order of St. Basil, who lived in the 4th century. He retired into a desert in the province of Pontus, where he founded a monastery for the accommodation of himself and his numerous followers, and modation of nimself and its numerous followers, and, it is said, draw up certain rules, amounting to several hundreds, for the better regulation of this new society. This new order soon spread all over the East; nor was it long in extending also into the West. Some assert that Basil saw himself the spiritual father of more than 90,000 monks in the East only; but this order, which 80,000 monks in the East only; but this order, which ideurished for more than three centuries, was considerably diminished by heresy, schism, and a change of empire. It is said to have furnished 14 popes, 1,805 bishops, 3,010 abbots, and 11,085 martyrs. It likewise boasts of several emperors, kings, and princes who have embraced its rule.

Basilica, basil-i-kā (Gr. basilike, a royal residence, a palace), a term applied to the large buildings created in Rome, and other cities of the Roman empire, for the administration of justice. They also pripe, for the administration of justice. They also served the purpose of an exchange, in which merchants transacted their business, being generally built in the immediate neighbourhood of the forum. The following was the method of construction generally adopted. A large central space, about twice or three times as long as it was wide, was surrounded with columns, on which a roof, called the testudo, was supported. On either side of this space porticos were added, covered with a roof sloping from the columns of the testudo, and supported on the outer side by another row of smaller columns at a distance of about one-third of the breadth of the central space from those that held the main roof: a wall was afterwards substituted for the outer columns of the portice, to afford shelter to those within the building. The portico was divided into two parts by a floor, the upper part forming a gallery for the accommodation of those who were looking on at what was passing below, or perhaps for the exposure of commodities for sale, or for carrying on some handicraft trade. There was a vestibule, or large porch, at one end, and at the other a tribunal for the administration of justice, with a semicircular recess, or apsefor the judge's seat, with chalcidica, or chambers for the use of the judge, counsel, &c., on either side of it. Basilice were unknown in Rome until about n.c. 200, but after that time they were generally built in towns in all parts of the Roman empire. The best example we have of the old basilica, or hall of justice, is that at Pompeii, built on the south-west side of the forum, occupying an area of about 300 feet long and 110 feet occupying an area of about 300 feet long and 110 feet broad, including the external walls. The vestingle at the lower end, is 100 feet by 30; the testudo, or cent-area, about 192 feet by 54; the portioos surrounding the testudo being 24 feet wide, while the tribunal, at the upper end, is 54 feet by 30, with chalcidica on either side about 30 feet by 24. On entering the ves-tibule at the left-hand side, there is a staircase leading to the cellulation of the west. to the galleries of the portices. The early Christian churches, and, indeed, the churches of the present day, bear a strong resemblance to the old basilicas in their general arrangement; and it is probable that many of these old balls of justice and exchange at Rome were converted into places of worship by the first professors of Christianity in the imperial city. The central area corresponds to the nave; the portices to the asisles, which are commonly furnished with unsightly galleries; the vestibule to the space usually occupied by the tower at the west end of a church, or to the great western entrance in a cuthedral; and the tribunal of the Roman magistrate to the chancel and railed space inclosing the communion-table. In the old churches the resemblance was more striking, as the bishop's throne was placed in the semi-circular apse immediately behind the high altar, which was placed under a canopy in what was called the sanctuary. Among the most famous at Rome may be mentioned Trajan's Basilica, and those of St. Peter, built a.D. 330; St. Paul, 886; St. Agnes, 625; and St. Maria in Trastevers, 1135. Of modern Italian basilicas, used for the same purposes as those of ancient Rome, the best specimens are those of Vincenza (built by Palladio about 1550), Padus, and Brescia.—
Ref. English Cyclopadia—Arts and Sciences.

Basilican Cods, or Basilica, a Greek translation of Basilican Cops, or Basilica, a Greek translation of the Codex Justinianus, a code of laws collected together by Justinian I., emperor of Rome, in 527. The design of reducing this code of laws into one Greek book was frat commenced by Basil I., the Macedonian, emperor of the East, in the 9th century. The Basilican code, however, was not reduced to its present form till she early part of the 10th century, by Constantine VII., when it was published under the title of "Basilica repetita Praelectiones." From that period it became the common code of laws for the East.—Ref. Hanbold's Manuale Basilicarus. Manuale Basilicorum

Basilicon, bu-sil-i-kos (Gr. basilikos, royal, or of great virtue), in Phar., the name sometimes given to an ointment, composed of 5 parts resin, 8 parts lard, and 2 parts yellow wax. It is much used as a stimulant dressing to blistered surfaces, with a view to keep up the discharge; and as a vehicle for other stimulating substances, such as savin and Spanish flies. It is called ceratum resine in the Pharmacopæia. Formerly bu-silicon was prepared with yellow wax, pitch, resin, and olive-oil, and was hence named unquentum tetraphar-macum, 'the ointment with four drugs.'

MACUM, 'the ointment with four drugs.'

BASILICON DORON, (Gr., royal gift), the title of a work written by James I. for the instruction of his son, Prince Henry. It is divided into three books. The first is entitled "Ofa King's Christian Duty towards God;" the second treats of "A King's Duty in his Office;" the third expatistes upon "A King's Behaviour in Indifferent Things." This work, in common with the other productions of the regal author, possesses at present no great degree of interest, otherwise than at present no great degree of interest, otherwise than

as a literary curiosity.

Basilipiams, bās-i-lid'-i-āns, in early Eccl. Hist., is the name given to a religious sect founded by Basilides, a Gnostic of Alexandria, who flourished in the earlier half of the 2nd century. The two great dogmas which formed the groundwork of his system were those of emanation and dualism. He held that the unrevealed God evolved out of himself the several attributes which God evolved out of himself the several attributes which express the idea of absolute perfootion, being the intellectual powers, the mind, the reason, the thinking power, wisdom, might, and, lastly, the moral attributes. These seven powers, which he regarded as living, self-subsistent, and ever-active, together with the primal ground out of which they were evolved, constituted the lirst ogdoad, or octave, the root of all existence. Each of these spiritual essences proceeded to evolve out of viself continually numberless gradulous of out of itself continually numberless gradations of existences, each lower one being still the impression, the antitype, of the immediate higher one. As he had in his system seven homogeneous natures in each gradation of the spiritual world, so he is said to have al tout there were 365 such regions or gradations of the spiritual world, answering to the days of the year. One grand idea of this system was, that in different degrees, and under different forms of application, one law pervades all stages and kinds of existence; and that everything, from the highest to the lowest, is governed by a single law. How he accounted for the existence of evil does not seem clear; but he held that everywhere, as rust deposits itself on the surface of iron, darkness and death cleave to the fallen seeds of light and life,—the evil to the good, the ungodike to the godlike; without, however, the original essence being thereby destroyed. The whole course of this present world he considered as intended for such an end; that the godlike may be cleansed from all impurities, and restored to its original purity. He considered the development of the human race as a process of purification, which was to be perfected by Christianity. His great aim was to lead men to consider the whole universe as one temple of God. Faith in the justice and goodness of God rose in his mind above everything else; and when he was perplaxed with difficulties, his last words ever were, "I wil say anything sooner than doubt the goodness of Providence." The development of this system led Basilides, and his followed by the development of the system led Basilides. lowers into many erroneous opinions, particularly with respect to the character and mission of Christ, whom he did not regard as the Redeemer; and held that he differed from other men only in degree, and need that he differed from other men only in degree, and, like the rest, himself atood in need of redemption.—Ref. Neander's History of the Christian Religion, vol. ii.

Bastlisk, bdr's-lisk (Bosiliscus).—Although this

Rasilisk

Basset

creature has no affinity to that terrible serpent believed creature has no attinity to that terrible serpent beheved by the ancients to indict death by its gas, yet it is suffi-ciently ugly to engender an uncomfortable sensation. It is found in South America, and occasionally attains a length of three feet. Instead of the comb-like ridge of the ignams, the besilisk is furnished with a broad

of the iguans, the basilisk is furnished with a broad membrane running down its back, and a second, still broader, on the upper surface of its tail. This process is capable of either expansion or contraction. The hind part of the basilisk's head hears a remarkable pointed hood. Notwithstanding its unsightly appearance, the basilisk is a perfectly harmless reptile.

Basuren (Gr. basilisko, from basiliaus), a fabulous serpent, said to have been able to kill with its breath or sight only. According to Galen, its colour inclined to yellow; and it had three small eminences on its head. They were speckled with whitish spots, and presented the appearance of a crown. Alian says that its poison is so penetrating as to kill the largest serpents with its vapour only; and that it will kill a serpents with its vapour only; and that it will kill a man by merely biting the end of his stick. The sound man by merely bring the end of ins stock. The sound of its hissing is enough to frighten away all other kinds of serpents. According to Pliny, the basilisk is able to kill all those who look upon it. It is also called a cockatrice, from the belief that it was generated from eccuaries, from the best that it was general. All those details are put forth by Matthiolus, Galen, Dioscorides, Pliny, and Erasistratus. The absurdity of all the statements has since that time been thoroughly exposed. In some apothecaries shops, formerly, little dead ser-pents were exhibited, which were said to be basilisks. These were, however, only small birds without feathers, having their heads raised, wings like a bat's, eyes large, and necks very short. At Venice, and other towns on the continent, animals are shown which are called basilisks. They are, however, only small thornbacks, with their fins stretched out, and artificially arranged so as to resemble young cocks. This Calmet says he observed in an spothecary's shop in Paris.

BASILISE, a kind of ordnance used in ancient times and so called from its supposed resemblance to the fabulous serpent bearing the same name. It is now completely out of use; but, during the wars of Hungary, it was much employed by the suits n Solyman. The basilisk cannon three a 200-pound iron ball.

BASILOSATRUS. (See ZBUGLODON.)
BASIN, bai'-sin (Fr. bassin), in Geol., a term applied to any dipping or disposition of strata towards a common any upping or disposition of stress towards a common centre, which has resulted from the upheaval and subsidence of the earth's crust. The tertiary formations often occupy limited areas, and fill up the basins of the older strats; hence the use of such phrases as "London basin," "Paris basin," &c.

BASEN OF A DOCK, a place where the water is confined by double floodgates, or a caisson, and thereby prevented from running out at ebb tide. The use of it is to contain ships either before they enter, or after they come out of the dock in which they are repaired. Basin also implies some part of a haven, which opens from a narrow channel into a spacious receptacle for shinning.

BASKET, bas'-ket, an article of domestic use, made principally of the interwoven twigs of willow or birch-trees, and often of straw, rushes, or other articles. They are made in every variety of quality, and in every high of shape, and are used for holding all sorts of dry goods. The value of the baskets imported into Eugland during the year 1857 was £35,348. A large quantity of material for making baskets is also imported

into this country.

into this country.

Baring Brank, bde-king shark, a large, immensely strong, but still harmless species of shark. By the Irish it is called the sunlish. (See Shark.)

Basque Larquete, back, is the name given to the language spoken by the inhabitants of the Basque provinces of Spain and of part of Spanish and French Navarre. The people call themselves Euccaldunae, their country Euccaleria, and their language Euccara. For a long-time the Basque language was supposed to be a dialect of the Celtic; but later researches have that this is not the case, and that there is some shown that this is not the case, and that there is some ground for supposing it to be an ancient language, distinct from any of the other European languages; and it is said by some to have an affinity to certain of the Americ tongues. It seems to have been at one

time the language of the whole of the Spanish peninsula; for we ind traces of it in the names of mountains, rivers, &c., in almost every part of the country. The Busque language possesses a great variety of terminations. According to some, the neun has six esses; according to others, cloven. The verbs are said to bave cleven moods and forty-six tenses. The structure of the sentences is very simple. The substantive is always placed first; then the article; then the adjective; next the adverb; then the verb; and lastly the object, with the preposition affixed to it.

the object, with the preposition affixed to it.

Bas Briter. (See Relieve).

Bass, Base, or Basso, bains (Ital. basso), in Mus., are terms all of which have the same meaning, and signify the lowest or deepest part. The bass, or lowest part, is, with sound musicians, the most important of all the parts: it is, indeed, the foundation of harmony,—the support of the whole superstructure of the composition. The word base is technically used in various ways, as thosewed hass. fundamental base. mony,—the support of the whole superstructure of an composition. The word bass is technically used in various ways; as, thorough bass, fundamental bass, ground bass, figured bass, &c. A figured bass is a bass with figures written over or under each note, to indicate the accompanying harmonies. The term figured bass is used as synonymous with figurative bass, meaning a bass not confined to the plain canto-fermo style, but the conting with more freedom, and with a melody of its moving with more freedom, and with a melody of its own: for instance, the bass in Bach's arrangement of the Old Hundredth. Fundamental bass is that bass the Old Hundredth. Fundamental bass is that bass which forms the tone or natural foundation of the incumbent harmony, and from which, as a lawful source, that harmony is derived. To explain this by example:—If the harmony consists of the common chord of C, C will be its fundamental bass, because from that note the harmony is deduced; and if, while that harmony is continued, the bass he changed to any other note, it ceases to be fundamental, because it is no longer the note from which that harmony markets. is no longer the note from which that harmony results and is calculated. Ground base is used sometimes as synonymous with fundamental base, and sometimes as a base which starts with some subject of its own, and continues to be repeated throughout the movement, while the upper part or parts of the composition pursue a separate air, and supply the harmony. This kind of bass was greatly in fushion about half a century since, but has for some time been rejected, as an unnatural restraint upon the imagination, and productive of a monotonous melody. Therough bass is the art by which harmony is superadded to any proposed bass, and includes the fundamental rules of composition. This branch of musical science is twofold,—theoretical and practical. Theoretical thorough bass comprehends the knowledge of the connection and disposition of all the asverse chords, harmonious and disponant and while the upper part or parts of the composition pursue the sayeral chords, harmonious and dissonant, and includes all the catablished laws by which they are formed and regulated. Practical thorough bass is conversant with the master of taking the several chords on an instrument, as prescribed by the figures placed over or under the bass part of a composition, and supposes a familiar acquaintance with the powers of these figures, a facility in taking the chords they indithese figures, a facility in taking the chords they indi-cate, and judgment in the various applications and effects of those chords in accompaniment. The bass is that part of a concert which is the most heard, which consists of the gravest and largest sounds, or which is played on the longest pipes or strings of a common instrument, or on instruments larger than common for the purpose.

common for the purpose.

BASS, COUNTER. (See CONTRA-BASS.)

BASSE, OF SEA-PRECH, blues, a marine fish, the Labraz Lupus of Cuvier. The fishes of this gen. belong to the fam. Percide, or Perches, with whom they are closely allied. The basse is to be met with along the British and Dutch shores, and abundantly in the Mediterranean. By the ancient Greeks and Romans it was highly esteemed as an article of food. On account of its voracity, it was called by the Romans tupus (wolf), a name still retained as a designation of the species. It was held to be the most cunning of fishes; and Aristotle declares that when encompassed by a net, it Aristotic declares that when encompassed by a net, it would effect its escape by digging a tunnel for itself in the sand. Its length is generally from a foot to a foot and a half; but it has been found of a much larger size. There is an American species of bases, which is

termed by Cuvier Lupus macronatus.

BASSET, bits'-set, a term applied by miners to the

### Resect

emergence at the surface of different mineral strate from beneath each other. It is also applied to open-ings from or into mines from the surface.

Basser, a game at cards, played in a manner similar to that of the modern fare. It was formerly very to that of the modern faro: It was formerly very much played in France. The mode of playing is as follows:—The banker deals the cards in pairs, and each punter, or player, has a livest of thirteen cards, from which be selects one or more, and stakes on them. The principle of the game depends upon the corresponding card in the banker's pack turning up in an odd or an even place. When a player wins, he may either take his money or go on, risking his stake and gains. The first time this is done it is called paroli, or double; the second time, sept et la va, fifteen, &c.; the fourth time, quinze et la va, fifteen, &c.; and on the fourth time, trente et la va, intry-one, &c.; and on the lifth risk, scipante et la va, sixty-three, &c. In all cases the odds are greatly in favour of the banker: it is 1,023 to 1 against the player winning ten successive times. Louis XIV. issued some very severe decrees eigainst the game of basset, and after that time it was played under the name of pour et coutre. played under the name of pour et contre.

syed under the name of pour et conure. BASSET HOUN (Ital. corno di bassetto; Fr. cor An-BASSET HORN (itsl. corno di bassetto; Fr. cor Anglais), an instrument now but sedom used. Its tone is very sweet, and in solo passages it is capable of producing very striking effects. It resembles a hauthoy of a large size, a little bunt at the top. Its real compass comprises the notes contained between F bass and latt, except the note F sharp, which is deficient. As the person who plays the hauthoy generally takes this instrument, the next for it is result written a fifth instrument, the part for it is usually written a fifth

Bass Horn.—This instrument, formerly a great deal used in bands, has declined much since the intro-duction of the opbicleide, which it somewhat resem-les. The player of the bass-horn should possess a quick and correct ear, and a knowledge of thoroughbass, in order to perform acceptably. The instrument has been found rather imperfect, and is not now much used.

BASELA, bis'-sigg, in Bot., a gen. of plants belong-ing to the nat. ord. Supotaces. The species are trees, satives of tropical or sub-tropical regions. They are remarkable for their floshy flowers and oily seeds. In remarkable for their floshy howers and oily seeds. In India, the fatty oils procured from the ripe kernels of B. latifolia, the Madhuca-tree, and B. longifolia, the Biloopa-tree, are made use of for burning in lamps, for culinary purposes, for making soap, and, medicinally, for external applications in cutaneous affections. The fleshy flowers and fruits are used as food, and from the former an alcoholic liquor is distilled. The wood of B. langifolia and other species is very hard and durable. The Shea or Galam butter, which forms an important article of internal commerce in Central Africa, is thought by some to be the produce of a species of bassia.

Basso. (See Bass.)
Bassoon, bus-soon' (Fr. basson), a musical wind in strumeut, made of wood, and played by means of a bent mouth-piece and reed. It is supposed to have been introduced into England by Handel, as a kind of help to the hautboy, which it so nearly resembles in tone as to make it the natural bass of that instrument. The compass of the bassoon extends from double B The compass of the baseoon extense from course is flat up to B flat in all, three octaves, including all the intermediate semitones except B natural. When the baseoon ascends very high, the notes are generally written in the tenor clef.

BASSORA GUM, bde'-sor-a, a whitish or vellowish substance brought from the neighbourhoed of Bassors. It differs from most gums in being nearly insoluble in water. The plant yielding it is believed to be a species of Mimosa. It contains a peculiar principle, called Bassorin, which also exists in gum-tragacauth.

Bass Viol. (See Violonerile.)

Bass VIOL. (See VIOLONCELLO.)

Bass, or Bass, biss, a name commonly given to the inner bark of trees. Russian mate are manufactured from the bast of the lime-tree. (See Liber.)

Basnam, bis'-tird (Walch, bustardd; Fr. bdtard, of low birth; from Ang.-Sax. base, mean, disgraceful, and owl, source, origin).—In English Law, bastards are such children as are not born in lawful wedlock, or within a commutate; time effect its detarmination, and each had competent time after its determination, and are held to be nullius filii, the sons of nobody. If children be

## Bastille

born in ever so short a time after marriage, they at born in ever so short a time after marriage, they are legitimate; but, notwithstanding they be born during marriage, they may be proved bastards where the him-band be out of the kingdom of England for such time as will shut out the presumption of access to his wife, and by other cogent evidence; as by roof of the impotency, of the husband, or that he and his wife had no oppor-tunity (though both within the realm) of sexual inter-course within such neriod as is convisient with their tunity (though posts which was to consistent with their course within such period as is consistent with their being the parents, or even by proof of circumstances tending strongly to the inference that no such intertending strongly to the interence that no such inter-course (supposing it to be possible), in fact, took place. So in a divorce, after a decree of judicial separation, if the wife afterwards have children, they are bastards; for the law will presume the husband and wife live conformably to the sentence of separation, unless access be proved. And after a decree for dissolution access be proved. And after a decree for dissolution of the marriage on the ground of adultery, all children of the woman not born within due time thereafter, even though they may be begotten by the husband from whom she has been divorced, are illegitimated. And in case of a decree of nullity of marriage, all the issue born even before the divorce are bastards, be cause such divorce is always upon some cause which rendered the marriage unlawful and null from the beginning. But except where a divorce has taken place between the married parties, or evidence is given of facts sufficient to disprove their sexual intercourse, the law always presumes in favour of the legitimacy of a law always presumes in favour of the legitimacy of a child born to the wife during the marriage. Upon the same principle, too, legitimacy will always be presumed (subject to the same exceptions) with respect to children born after the coverture has ceased, by reason of the husband's death, unless the birth takes place so long afterwards that the child clearly could not be begotten by him. The extreme period is a point which has he not avently determined, and is left to the the law has not exactly determined, and is left to the decision of a jury, who are to judge of it according to the circumstances and the testimony which persons of experience may give of the course of nature on this subject. Bastards are incapable of being heirs. The civil law differs from ours on this point, and allows a bastard to succeed to an inheritance, if, after its birth, the mother was married to the father; and also, if the father had no lawful wife or child, then, even if the concubine was never married to the father, yet she and her hastard son were admitted each to one-twelfth of the inheritance; and a bastard was likewise capable of succeeding to the whole of his mother's estate, although she was never married, the mother being sufficiently certain, though the father is not. (See APPILIATION.)

BASTILLE, bas-teel', the name formerly used in France

to denote a fortress or state prison defended by towers or bastions. There were three buildings of this sort in Paris,—the Bastille de St. Antoine, the Bastille de St. Peris,—the Bastille de St. Antoine, the Bastille de St. Denis, and the Bastille du Tumple. The first is the most celebrated, and was built by Hugues d'Aubriot, mayor of Paris in 1369, at the Porte St. Antoine, and was originally intended as a defence against the English. It consisted, at first, of two towers, botween 70 and 80 feet high, with a gateway between them. It was sout changed from a fortress to a state prison, and two other towers, similar to the first, were built parallel to them, and the whole connected with massive walls. In 1333 two more towers were added, at equal distances to the first, and also united with strong masonry. The towers were each divided into four stories, and the summit of each was fortified with cannon. The whole building were each unruled into annon. The whole building was surrounded with a deep most; and the road into the inner courtyard was over a drawbridge. The unfortunate prisoners, who principally consisted of noblemen and men of letters, were confined within the towers, or in dungeons below the level of the ground. The walls of the towers were six feet thick; and light and air were admitted to the dungeons through narrow slits towards the moat; and the rooms in the towers sitts towards the most; and the rooms in the towers had glazed windows atrongly grated: A daily sum was allowed to the governor for the maintenance of each prisoner; and this sum, which was given by the king, varied according to the rank of the prisoner. The principal officers in command of the Bastille were the governor and the leader and the ros. The mode of arresting prisoners was by lettres de cachet, sometimes signed by the king himself, and countersigned by one of the ministers. After a prisoner was immured, his name

two

the

was never mentioned; he was always known by the number of the cell or dungton in which he was centined. Thus many persons became so shut out from the world, that some of them were forgotten; and in some cases Thus many persons became so shat out from the worse, that some of them were forgotten; and in some cases it was found impossible to discover who they were, and why they had been sent there. The most extraordinary captive in the Bastille was "the man with the iron mask." He was brought from the island of St. Marguerite to the Bastille in 1698, by M. de St. Mars, the newly-appointed governor. His face was never seen, and his fare was the most sumptuous that could be provided. The wowsman never set down in his presence. and his fare was the most sumptuous that could be provided. The governor never sat down in his presence. He died Nov. 13th, 1703. There are many conjectures as to who this mysterious prisoner could have been; the most probable supposition is, that he was the twin brother of Louis KIV., whose birth had been concealed by Cardinal Richelieu. The French mob attacked the Bastille in 1789, and it was yielded up to them, after a few hours, by M. de Launay, the governor, who was immediately afterwards nurdered and then beheaded. Seven prisoners were found inside, one whom was an Englishman, and he was deranged. The whole building was soon after demolished, by a decree of the mayor

was soon after and consistency of the last name, to beat with a sitch), a punishment attended with great pain, and often with bodily injury, consisting, in the strict sense of the term, in the infliction of blows on the soles of the term, in the infliction of blows on the soles are also as with a thick stick. It is sometimes applied of the feet with a thick stick. It is sometimes applied to beating administered on the body and limbs. Turkey and Russia are the only European nations in which this mode of punishment is sanctioned by law, and in both countries it is carried to a most unjustifiable extent, the sufferers being frequently maimed and injured for a considerable period, if not for life. In Russia, the instrument of torture is a heavy whip, the sufferers being frequently maimed and called the knout. The bastinado is a common kind of punishment in China, as well as in Persia and all Eastern nations professing the Mahommedan faith, blows being ordered by the Koran for many offences of a minor character.

BASTION, blatt-you (Fr.), a large mass of earth, usually faced with brickwork, or stones, and forming a tower which stands out from the ramparts surrounding s town or place to be defended. It corresponds with



ther with form the The time when bastions were first introduced into fortification is not known; they probably originated in the projecting towers on the walls of fortresses, used for the purpose of observing the enemy when close to the foot of the ramparts. After the year 1500 they were well known and much used. The town of Tarin, in 1546, was defended by complete fortifications, including four hastions. The Italian engineers soon become celebrated for their skill in military fortification after the invention of bastions. During the reign of Queen Elizabeth an Italian engineer, named Genebella, was employed in order to appearing the formation of a hastioned rampart round the castle of Caristrock, in the Isle of Wight. Bastions are now made of various kinds,—solid, hollow, regular, &c. Solid bastions are entirely filled up with earth up to the level of the platform of the guns, while hollow hastions have the interior level with the ordinary ground. Regular bastions are those which have their faces, tification after the invention of bastions. During the

flanks, &c., in due proportion. A denii-bastion, or spaulement, has only one face and one flank. A double bastion is when one bastion is raised within and upon the plane of another bastion. A flat bastion is one built in the middle of the curtain or wall connecting the two angles of a rampart. A composed bastion is one in which the sides of the interior judygon are unequal; thus making the gorges also unequal. A bastion is called deformed or irregular when the faces, flanks, &c., are not in symmetrical proportion; and a cut bastion, or bastion with a tenaille, is one whose salient angle has been cut off, and has, instead, an

salient angle has been cut off, and has, instead, an angle opening inwards, with two points outward. If the angle of a basion is less than 60°, it is found to be too small for the use of guns; besides, being so acute, it is easily battered down by the enemy.

Bar, bat (Chiroptera).—So much does this singular creature appear to partake of the character of the feathered tribe, that naturalists of an abusent date experienced a difficulty as to its proper classification in the system of nature. The anatomical and intestinal structure of bats, however, combined with their viviparous nature, their hair, &c., without doubt entitles them to be ranked as quadrupeds. Although the appellation "flying" has been given to certain groups of this class, owing to their mode of flight, they only possess the power of gliding from one point to another possess the power of gliding from one point to another by the agency of an expanded skin, which serves to buoy them; their agrial motion, consequently, differs only in extent from the leap of an ordinary manmal.
With the bats, however, the anterior members are as
completely organized for true flight as those of a bird. As in the birds, the bones supporting the anterior members are large, the humerus rather short, and the bones of the fore-arm long; but the latter are quite separate and movable, as in the human arm. The bones of the fingers, however, instead of being amaigamated, so as to form a single series, are all quite distinct, and, when extended, radiate widely from the wrist, the bones of which are of small size. The thumb which, the bonds of which are of a mass size. In a faith is short, but the other four ingers excessively elemgated: the first finger is the shortest, and the others of meanly equal length. The four long fingers and the bones of the arm are united by a delicate lestilery membrane, which is also united to the sides of the body as far as the extremities of the hind-logs, and sometimes fills up the space between them; and it is by the agency of the broad wings, formed by the exby the agency of the orona wings, to that the bats are enabled to flutter through the air. The thumbs of the anterior feet are small, free, and furnished with sharp curved claws, by which the animals can suspend themselves to any convenient projection. The thumbs of the auterior hands and the hind feet are the only means by which the but can progress along the ground, where, as might be expected, it is very swkward in its movements. Dentition varies in the different families, according to the peculiar nature of the creatamines, according to the pectnar nature of the creature's food. The body is covered with a soft down, but the membrane of the wings only exhibits a few scattered hairs. The tests are placed on the breast, and the young, when sucking, cling to that part of the mother's body, and are carried about by her. Their scusses of smell, hearing, and feeling, are very acute, and in some the nose is furnished with a membraneous clinting of most delicate extractors by a which the second foliation of most delicate structure, by which the sense of smell is greatly enhanced. The ears, in many kinds, are expanded, and capable of being folded down; while their full wings and the tissues of the ear and nose are so amply furnished with nerves as to enable them, even though deprived of sight, to pursue their flight through the narrowest passages without danger. On the approach of winter, the bat relapses into a state of lifeless inactivity, and in selecting a spot for hybernalittless mactivity, and in selecting a spot for hyberna-tion, appears to regard security from molestation be-fore say other consideration. "The hybernation of these animals," writes Mr. Bell, "is; indeed, one of the most interesting points in their economy. At an earlier or later period of autumn, according to their species, they retreat, generally in large congregations of various species together, to the most retired places, as under the roofs of houses and abunches in examp as under the roofs of houses and churches, in caverns, in the bollows of trees, and similar situations, where they suspend themselves by their hinder claws, with their head downwards. Here they crowd together, hold-

ing not only by the surface of the walls of their retrest, but by each other, one crowding over another so classly that it appears accreety possible fire such numbers that it appears accreety possible fire such numbers to county so small a space. The common but, or flitter-mouse (Vespertitio nipsettellis), is more frequently met in this country than any of the others. It makes its appearance in the twilight of fine summer eventings in lanes and short places, or haunts the vicinity of quiet streams, where any sort of noctural insects abound. Although not more than two and allfinders long, or about the size of the common brown mouse, it is very voracious, and must in a single evening consume a vast number of insects. In dull weather, no matter though it be the middle of summer, the flitter-mouse keeps within doors as though it were mid-winter. The long-eared bat (Piccotus aurius), like the flitter-mouse, is also commanly found in the vicinity of buildings. It is the most elegant of the bats, and certainly most easily temed, learning to come at a whistle and take flies from the hand. The come at a winste and take lies from the hand. The cars are very long and transparent; when the animal is alsoping they are concealed under the wings, whilst the inner lobe of the ear still projects, giving the creature the appearance of possessing short slender ears. The mouse-coloured bat (Vespertilio murinus), the long-eared bat (Piecolus auritus), and the great bat (Vespertilio mociula), also count among the well-known British bats. The horse-shoe bat (Rhinolophus) resembles the common bats in its general babits but Sritish bats. The horse-shoe bat (Rhinolophus) resembles the common bats in its general habits, but is even more nocturnal, being satisfied with nothing short of absolute darkness for its place of retreat. The animal derives its name fom the possession, above its name, of a singular leaf-like membraneous appendage, shaped somewhat like a horse-shoe. The



horse-shoe bats are abundantly distributed over the warmer regions of the earth, but Britain numbers but two of them,—the great and little horse-shoe The largest of these two measures two and a bat. The largest of these two measures two and a half inches in length, while the lesser is one of the smallest British species of the order. The most terrible of all the bats is the one that has earned for itself the title of Yampyre (Phyllostoma spectrum). Like the horse-shoe bat, it is furnished with a nose-crest; the canine teeth are large, and in almost all the species there are four incisors in both jaws. Some of them are so harms as to measure two and a half feet in the species there are so harms as to measure two and a half feet.

ton, agree in considering the bat in question dengerous to life, and the inter sites in that he has repeatedly seen both men and beasts who have been nucked, and has misstely examined their bleeding wounds. This authority, however, confesses that, although a constant observer in the ramper's country for the space of eleven months, he could never discover how the rampyre drains the blood. "I sign alone in the loft of a woodcutter's shandoused house in the forest; and though the vampyre came in and out every night, and is woodcutter's shaudoused house in the forest; and though the vampyre came in and out every night, and I had the fluest opportunity of seeing him, as the moon shone through the apertures where windows had once been, I never could be certain that I saw him make a positive attempt to quench his thirst from my veins. though he often hovered over my hammock." Azaro states, that the inhabitants of Paragnay have no dread of these animals, though they frequently enter the houses, and suck the blood of those who may in-

house, and suck the blood of those who may in-cautiously expose any part of their body.

BATATAS, buttait tax, in Both, a gent of plants be-longing to the nat. ord. Convolvataces. The most important species is B. stalis, the Sweet Potato, a native of the East Indies, but now cultivated in all tropical and sub-tropical countries for its tubers, which, when roasted or boiled, form a wholesome and highly-nutritious article of food. Next to make, the sweet potato is the principal food of the poerer classes in

America.

BATH AND BATHING, bath.—Bathing, in its most general acceptation, denotes the application to the surface of the body, or a part of it, of a medium dif-ferent, or of a different temperature, from that by which it is usually surrounded. The substance which constiit is usually surrounded. The substance which consti-tutes this medium is, in Med. language, termed a bath. tutes this medium is, in Med. languago, termed a bath. Baths are of various kinds, and are distinguished according to the substances of which they are composed, as water, vapour, sir, said; according to their temperature, as cold, tepid, hot; according to the mode of their application, as plunge, shower, douche; according as they are general or partial, natural or artificial. Undoubtedly the custom of bathing dates from the artifact sixtance of the human rane. from the earliest existence of the human race. At first they would use such natural baths as the rivers or seas afforded; but doubtless, in no long time, they came to employ artificial ones; and we find the warm both mentioned as early as the time of Homer. Afterwards both public and private baths came to be com-mon among the Greeks; but we know little of their construction and arrangements. The public baths were mostly in connection with the gymnasis, and were taken immediately after their athletic exercises. It was not until the reign of Augustus that the public baths at Rome came to assume that magnificence and splendour which afterwards characterized them. They were termed thereas, or hot baths; but they also contained cold baths. In the latter period of the empire, Rome contained an immense number of baths, in various parts of the city. Different authors reakon upwards of 800 of them; but the most calebrated were those of Arminas Armanians (Casachia Thiad-Thiad upwards of 800 of them; but the most celebrated were those of Agrippa, Antoninus, Caracalla, Diodetian, Domitian, Nero; and Titus. Those of Diodetian are said to have been capable of secommodating 1,800 bathers. The vestiges of these buildings that are still to be seen indicate the great magnificence of the original structures. Mr. Fergusson, in his "Handbook of Architecture," says, "There is nothing in the world which for also and grander can compress with these species there are four incisors in both jaws. Some of Architecture," says, "There is nothing in the world of them are so large as to measure two and a half feet which, for size and grandeur, can compare with these across the extended wings. There can be little doubt that their favourite food is blood; but the narratives of a first favourite food is blood; but the narratives of considering them with their broad wings, and so continuing till the fountain their broad wings, and so continuing till the fountain of life is exhausted, is, to say the less; open to discoveribes the operation:—"Knowing, by instinct, that the person they intend to attack is in a sound alumber, they generally alighe near the feet, where, while the creature continues faming with its enormous wings, which keeps one cool, he bites a piece out of the tip of the great toe, so very small, indeed, that the person they intend to attack wound, which is censequently not painful; yet knowing, by instinct, the of the great toe, so very small, indeed, that the principal parts of a Roman bath." Their pavements were mossic; that the person they intend to attack is in a sound alumber, they generally alighe near the feet, where, while the creature continues faming with its enormous wings, which keeps one cool, he bites a piece out of the tip of the great toe, so very small, indeed, that the continues for a principal parts of a Roman bath were—the kype-brad of a pin could scarcely be received into the wound, which is censequently not painful; yet knowing the principal parts of a Roman bath were—the kype-brad of a pin could scarcely be received into the wound, which is censequently not painful; yet knowing the principal parts of a Roman bath were—the kype-brad of a pin could scarcely be received into the wound.

The principal parts of these baths; "but the while both the walls increased by a portico. The main building obtained in the wound, of the principal parts of a Roman bath were—the kype-brad of a pin could scarcely be received into the wound.

above another; co immediately over the over the first, m second. From be obtained res the name given to the room for undrawing in, and it was also a place for desiding and conversation. The terms frigideries, theiderens, and colduction were likewest applied to the bathing apartments in which the cold, lepth, and not baths were placed. These hathing rooms had in theocastre of each, a large marble hasin, with cold, taped, or hot water. The colduction had helder wells, and the floor sected on low plines over the hypercessistics; so that it was surrounded on all sides with heated air. At one end of this apartment, which was is unally twice as long as it was wide, was the locolices, where a vase for washing the hands and fare was placed, called laram; and at the other end was the hot bath, called lararrum. Round the walls of the bathing-rooms were seats or benches, which, in the colductum, were reject one above another. the name given to the ping in, and it which, in the coldarium, were raised one above another, as in an amphilibratic, in order to give the bathers a choice of temperature, from the higher, of the upper part of the room, to the more moderate lower down. The medicarium, or electricism, was an apartment containing outments of various kinds for anonting the body. The usual time of bathing with the Romans was about two o'click in summer, and three is winter. Their mode of bathing was as follows: — After undressing, the body of the bather was anointed with a cheap coarse oil; on which he proceeded into the spharisterium, a very large spartment, devoted to exercises of various kinds, the most common of which was the ball. After taking a sufficient amount of exercise, he went into the adjoining warm bath, where he weeked, and scraped the surface of his body with instruments called strigiles, usually of horn or brouze. His body was then anointed usually of norm or bronze. His body was then adomined with performed oils. He then passed into the tepidorium, and thence into the frigidarium, in order to soften the transition from the intense heat of the caldarium to the open air. Plates XIV, and XV, exhibit the plan after the measurements of the calebrated Palladio, of the baths of Caracalla; of the references in which the after the measurements of the celebrated Palladio, of the baths of Caracalla; of the references in which the following is an explanation. 1. The great square survounded by a persico for the exercises of the stadium. 2. These portions of the porticos which served as antrances to the vestibules of the palestra. 3. The cells schears, or hall of saadals, of the palestra. 18 gates of which were furnished with lattice-work of bronze. 4. Festibules of the great hall. 5. The great hall furnished with the xystum 6. Other vestibules belonging to the lateral spartments of the palestra. 7. Others narrower than those already mentioned, the wides of which were ornamented with base relieving the sides of which were ornamented with base relieving the state of the same state of the same purpose, formed in the side-walls. 16. The other of the calls was resched. It was exposed to the south-west, and was converted by pipes to the two was converted by pipes to the lower leader. If the other of the could were considered to the south-west, and was converted by the sun, and at other times by furnaces. If the control of the theatre of the two two, whence pessing through the xystum, the great bath was resched. It was exposed to the south-west, and was converted to the theatre times by furnaces. If the control of the theatre of the two or the same purpose. If the control of the theatre of the control of the theatre of the two or the same of the theatre of the two or the same of the theatre of the two or the same of the theatre of the control. The control of the two or the same of the theatre of the control.

limates. 31. Openings with mon-sion of light to the sower story. the admission of light to the levee story, 42. Star-cases from the lower to the upper story, 23. Vesti-bules of the upper story, 24. Other augmouses of security the perticos.—Lower story, 25. Quarters of the pretorien bands with porticos in front. 36. Plecimis, or pools of cold water. 37. Porticos executed at a later period by Alexander Severus. 38. Cold bath with fountains in the centre. 39. Walks for publis ac-commodation. 40. Fountains, 41. Walls surrounding the summit of the hill on which the baths of Caracalla were creeted. 42. Open space around the reservoirs of water. 43. The aqueduct of Antoniums which sup-plied the baths, 44. Intermediate reservoir, isto which the water of the aquedact was discharged. 43. The opening by which the water was conducted to the warm bath. 46. The reservoir. 47. Walls of the city, anterior to those of Aurelian, which were enlarged by Caracalla for the extension of the baths. 48. The fountains mentioned in fig. 38. 49. Porta. Capean in the city wall. 50. Ports Terentins. 51. The Ap Way. From the preceding detailed description it 51. The Appear be perceived that in these prodigious monuments of Roman magnificence were assembled all the institutions favourable to health, to all the exercises of the body, and to the amusements of the people. Upon Pisto XVI, is shown the representation of an ancient bath with all its appliances in full operation, as described by Montfaucon. Bustace, in his "Classical Tour," thus describes the celebrated public baths of Caracalla:— "At each end were two temples, one to Apsilo and another to Asculapius, as the tutelary deities of the place (genic tutelares), sacred to the improvement of the mind and the care of the body; the two other temples were dedicated to the two protesting divinities of ples were dedicated to the two protecting divinities of the Automin family, Hercules and Bacchus. In the principal buildings were, in the first place, a grand circular vestibule, with four halfs on each side, for cold, tepid, warm, and steam baths; in the centre was an immense square for exercise when the weather was un-favourable to it in the open air; beyond it a granthall, where 1,600 marble seats were placed for the con-venience of the bathers; as each and of shis hall were liberies. This building takening the cold of the conlibraries. This building terminated on both sides in a court surrounded with pertieos, with an oftense for music, and in the middle asysticute basin for swim-ming. Round this edifice wore swites shaded by rows of trees, particularly the plane; and in its front exof trees, particularly the plane; and in its front ex-tended a gymussium for running, wrestling, &c., in fine weather. The whole was bounded by a vast portion-opening into excites, or specious halls, where the poets declaimed, and philosophers gave lectures to their auditors. This immense fabric was adorned within and without with pillars, stucco-work, paintings and statues. The stucco and paintings are yet in many places perceptible. Pillars have been dug up, and some stall remain amidst the ruins, while the Farnesian some still remain amidst the rains, while the Farmenan buil and the famous Hercules, found in one of these halls, amounce the multiplicity and beauty of the statues which once adorned the Therms (baths) of Caracalla." The well-known marble group of Laccoon was found in the baths of Titts in 1806. The Tarkish bath of the present day is essentially that of the ancient Romans. The Himans, or Turkish bath an it arists in Constantinguis is described. Turkish bath, as it exists in Coustantinopie, is described by Dr. W.J. Erssmus Wilson, in his work entitled "The Bastern or Turkish Bath." It is a large building, with a domed roof, a square massive body, from which minsdomed roof, a square massive body, from which minariouse by furnices. 17. Chambers or haths belonging
to the weathers and other combatants of the theatre
the presence of the stream of water in the centre.
The presence of the prophage as a chelter from the principal principal and some for the presence of the stream and some for the presence of the stream and some for the presence of the stream and some for the stream represents represents represents a present of the stream and some for the stream from the control of the stream and some for the stream from the control of the stream and some for the stream from the control of the stream and some for the stream from the control of the stream and some for the stream from the control of the stream some for the stream from the control of the stream f

fration; and to the and are eratore, the bath coverings, adquil rest. After a time the the and, it he finds the skin suffi-dened, the bather is again taken a third or inner spartment. The saw see hard or inner spattment. The states spartment—the caldarium or it was spartment—the caldarium or it was middle room. The atmosphere is samp miss of gauzy and mottled vapour, the table of the spartment is an extensive maddle of this spartment is an extensive maddle of the spartment in the spartment is an extensive maddle of the spartment in the spartment is an extensive maddle of the spartment in the spartment is an extensive maddle of the spartment in the spartment in the spartment is an extensive maddle of the spartment in the spartment in the spartment is an extensive maddle of the spartment in the spartment is an extensive maddle of the spartment in the spartment is an extensive maddle of the spartment is sparble slabe, and on this the bather a back, his scarf being placed beneath it his skin from the heated marble, and notest has akin from the heated marble, and in that served as a turban being rolled up aw under his being the heated marble as of shampooing his muscles being pressed sead, has joints being forcibly bent in all a said stretched until they snap After the ling, the bather is brought to the side of the ling which are placed marble beans about two smillers, samplied, by means of taps, with hot wisting, and is made to sit on a board near heater has a beauth a strendard draws on a by glove. "He stands over you, you bend isse, and he commences from the nape of the king sweeps down the back till he has started king sweeps down the back till be has started is king sweeps down the back till be has started at; his ownse it anto rolls, keeping them in and wiskin has hand they gather volume and length, his angoessively strikes and brushes them away, buy fail regist and left as if split from a dush of still. The dead matter which will accumulate heat fermes, when dry a ball of the size of the like the source of his frit none he pours water that the source the sixt to make off the armounter. the hash over the skin to rinse off the impurities offs is then thoroughly soaped and washed twice from head to foot, and, as a oney degree, a bowlets; is dashed over the entire body. The weight is article, removed, and an attendant approaches which is a conducted to the outer half, or mustain, and the standard proceed the particle of the count of repose is marked out and presented, the pipe follows, is sweather and presented, the pipe follows, is the standard out and presented, the pipe follows, is the standard out and presented, the pipe follows, is the standard out and presented, the pipe follows, is the standard out and presented, the pipe follows, is the standard out and presented, the pipe follows, is the standard out to the heavens, but, the standard out is upon the feathers or a napking the standard out for the through the standard out for the through the standard out for the standard out fo bann over the skin to rinse off the impurities the skin is electric. The time conspicate to four hours, and the operation is reweek. The process of hatling, then, as the Turks, consists of five distinct prograding. It has assuming of the hody in the large by which the skin becomes warm, just; if the shannoning or manipulation like; if the the throughout your manipulation like; if the scorf-skin; it the coaping and if the scorf-skin; it is couping and it is the measure of cooling and drying. scorr-sein; a the sosping and reases of cooling and drying, he outer hall. The modern a hirse of the sequent Romans put in here of wern water, see in the Turkish bath of the making which the

sipul ruoms, of which Dauger receives a cappea a man and another to put mand, to his knees), a third, if he to him to wind round his his turban, leaving the tap of the to put over his chest; and a when the buther has

himself in the manner shorts in opens to him the door of the apartment in this portion of two small chambers which adjust containing a tank of warm wa containing a tank of warm water apparatue consisting of two any wall, one of hot and the other bather having entered this past perspires fiely from the head duced by the bot water of the in by the brier. The operator of comes to him... The bethat or his apron or mapkin, or by tanks, to submit to the first of crecking his joints. The overry joint of his frame: he will every joint of his frame; he every joint or me stame; ne want way and then the other, to mission bree crack, even the neck is man wrenching the head round each a sensation rather alarming to a a sensation rather slarraing to each sou and each ear is generally the cracks the lumbs are wrested with but with such skill that sa unterest operation is never heard of. The process is to render the jourts usual attendant rubs the soles of the takind of rasp made of baked clay ton is that of rubbing the batter's course weellen bag. This done, the least due homes? tion is that of rubbing the bather conrider woolen bag. This does bowl please, dips himself in one of the is next carefully scaped, after a schee where if the scap, and, if regard that, or the scap is the same menner as before d it, or the outer apartinent. In this but, if the scap is a pread for the bather three three suppring a qup of the precince suppring a qup of the scap is a pread for the scap is a pread for the bather three three supprings a qup of the scape is a pread for the bather three three supprings a qup of the scap is a pread for the bather three three supprings a qup of the scap is a que to th kins and having one or two neptitions this he rechnes, suppose a cup of it is moking, while an attendant rade it and kneads his body and himbs. He halt as hour or as hour, then dresses. There are few pleasures in which the designt so much as in the bath, while have entertanments; and clean at they are not a little array in their at the part is not a little array in their and hat is well descended by Kall of Russia, from which work we say parkulairs — "The Russians see a warnur-bath, and m St. Pelsersian vapour-bath, and m St. vapour-bath, and in St. Paleral immesse number of them. On a troops of mechanics and labour of inen, women, and children, in traversing the stream, with hydral and birod twips in their hands bath, he ways, we first came in which a number of mag and of matter on begunns, all defunds pursuitation, and in red in adjusting themselves and adjusting, in drains themselves and demands.

bathed, and even in all melting from the open sar, o with birchen rods Shorease the smart showing stoves, as if they kiners, again, descending steaming at every pero, ser them by the paulial, of and for the purpose The effect of the heat is overcome, in commences in full activity, then the of warmth pervades the whole the of pleasure is all that remains to me, our whole being seems dissolved r. all pain and stiffness vanishes from of hight and buoyant as feathers The group with birchen twigs moreases the consequently the enjoyment it what it may, disappears in these darhe, toothanhe, crampy, convulsion ir face, gont, and rheumatism, not a lit is an extraordinary excitement a stion of the whole nervous system ides serving the great ends of bodily interpretary agent in and restoration of health (See Hy The most common medium employed in is water, at different degrees of temperature, in a subject of the subject of temperature, in a subject of the mids, according to their temperature. The residence into cold and hot wellding in the first communicate a sensation of rold and as a sensation of least to the body. This i & sensation of heat to the body. This is tary variable differing in different the easie time, and in the same individual mes, but, in most cases, it will be found in 84° and 87° Fabr On intering a cold they person ise is a sensation it id, a with a single shift shiddering, and, if the change like, a shock, the skin becomes pale and had the respiration hurrie i and integular and the golden and warmth return to the flow is diffused over the while body mas more than ten or twelve minutes inpears, and is succeeded by a general these. As the great object of cold bath face this glow, the bather should always refere to gree off. Henry cold hathing the state of the body are to on a reaction, and the chilling chicts age on a reaction, and the colling circus based. In the same were it and proper is the body is in a chilled state, or ex-citizing the properties of the colling and in properties. When one is strong and in integrity, before breaktast is the lest time that the react and cleurate necessary the or weak and deluate persons the out moon. If one teels coid, languad er tething, it is an indication that it with him; and it would be well for him to them to time, but tor some time, but the stion is in sume measure restored hould make a shorter stay in the Me one should bathe unmediately dd-bathing is puricularly valuable berroos irritability and sensibility, marsi debility — in cases of westrai debuity in cases of wrak-is, and has of power, it is also spid bath, which is intermediate he topid beth, which is merand and hot, and may be said to melude and hets, must now no man no manners for the one and the lowest degrees hers, from about 85° to 94°. The latest the general temperature of the part of the period of the sight!

muscles drappears, and It is of great use in alleviati tron, and is much resorted rulaire diseases It 18 had weak and irritable constitution port the shock of cold impact to be employed as a remedial a enervating for ordinary use as to produce fainting, which is a order to relax the tension of mi for the reduction of dislocations, open passages and such like -The rop powerful means of applying a great heat to the of the blood increase of the body It attracts the blood more the surface and, being followed by a perspiration, it is more powerful than It is employed as a remedy in gont and if and in some chronic affections of the ner and organs of respiration Vapour-baths already seen, are much used in the Best m and they have recently been introduced into t The following is renommended as a chi way of obtaining a vapour bath A pre-brick is made red bot and then laid on an ported on short fet. Over this is to a wooden chair, on which the person who is bath is scated. A four leaved screen, of painted canvas or cloths, is then put round blanket or thick cloth thrown over the to convert at auto a small chamler The r provided with a small jug or watering pas pours the water slowly ever the red-in cing immediately converted into steam, A losure, un l indu es a profuse perspiration Alth ugh it is certain that the most effects of haths depend upon their temperature of simple water with those of riversal waters, or sea, that the chemical components of the used in tathing ar circu iderable import water and mineral wat re particularly such sea salt or from in solute n, are more sonic, and bracing that comple water. House, screngtien and brace the a chiert is I almost always the chiect of cold bathing, to be preferred to fresh and althus cannot be the water, where practicable, should be read florely salme, by the addition of common as beneficial effects of certain substances with way mixed with the water in hashing, has introduct n of what are termed media. Baths of this kind are partly initations of hisl waters and partly other remedial mais substances thus mixed with the water is extent almost ed by the skin, and th These may be of various 945tem sait, potash, sulphur, non; vegetable, bark, or animal, as mik In the man , or animal, as mik haths, medicaments are sometimes offect se, sulphus, mercury, as such as are applied only id a pa-they are, of course, of various is being limited only by the number of to which water can be locally spe both differs from the ordinary plus water comes from above, and falls head and aboulders. The shock for is greater than that obtained the more particularly if the quantity of its temperature low, and its fall certain affections, particularly in

on advisely

Bath, Order of

the head, the form of britished advantages over every cider, from the efficient advantages of correspond cider, from the efficient at the first state of the first st

JACK, CADURAGY SETS, an order of knighthous, so called from histhing having amenuty formed part of the accommon premous to tustaliation. To the order as mainly attributed a very high antiquity. That hashing, from the explicit times, formed part of the caremony to be undergone previous to receiving the moreover of magnetic transfer in the new in the war of the mann previous to the forenestion of Henry IV, when that monatch opsificred the monour upon forty a x squites, who had watched all this night before in the T ever of London and then hathed themselves. Afterwards it became and ten hanged themselves. Alterwards it became untomary for the English kings to confer this dignity at the time of their coronation, or on other great considers; as on the coronation of their queens the manufartation of the prince of Wales, birth or marriage alroyal children, &c. The hast kinghis of the Bath resided in the ancient form were made at the coronation. hation of Charles II, in 1861, from which time the order was discontinued till it was revived by George I, order was discontinued till it was resuced by George 1, in 1783, with ordered a bot lot attaines to be dis an in fair its government. By this, the number of knights was fixed at thirty eight viz, the sourrigm a prine of the bloodstoyal, a grand master, and thirty the Laights companions. At this time it was a regular military order, and milliot, the prince regard, being leafrons to commemorate that auspicious termination of the time and ardinary contests in which the content. seasous to commonrate that auspicious (trimination of the long and ardious contests in which the country and been engaged, and to mark in an especial manner his sease of the valour, perseverance, and down a mainlested by the officers of the king affices both I y seased land, extended the limits of the rier of the Path and organized that the need or it is should be composed of bree slames, differing in rank and degree of dignity The order was still purely military but in 14 but in 1817 was extended to the admission of evil knights. The first risus of the order consists of knights and cross (K G.C.), the number not to exact, for military service, 50, exclusive of the sovereign, princts of the histograph, and such distinguished foreigners as may be nominated homorary K G C, and, in civil service, 56, Eschusive of the markets (K C B) number not to exceed, for military service, 102 for only service, 56, exclusive of foreigners. The members of this dissum as well as of the first are survived to the control of th if this class, as well as of the first, at entitled to be, and take precedence of knights bacholors Third Last,—dompations (CB), number not to exceed for military service, 525, and for evil service 200 11; take precedence of esquires, but are not cuttled to the appellation, style, &c., of knights backclors. No officer say be mominated to the military division of the third class of the order unless his service a have been marked by special mention of his name in the London track the shaving distinguished himself in action against the safer has never been conferred on as having distinguished himself in action against the successive and the order has never been conferred on any officer below the rank of major in the army or possessive below the rank of major in the army or possessive below the rank of major in the army or possessive the result in the next. The budge for the military contains a single factor of the order is as gold Mainess cross of eight possessive the passive passant-guardant; in the centre, the rost amplies a loos passant-guardant; in the centre, the rost amplies and the person, which is so tree for weaking clothes and the person, which is so tree for weaking clothes and the person, which is so the loos and the loos and the loos and the loos and the loos are and the loos ar

Baths and Wesh-bouses

mosto of the order, a neath, Ind dies. The wor, forced with al tores crowns upon a gle

with a red circle,
upon which is the
motio of the order, the laurel moto of the order, the laurel
wreath, and un
conenth, Ich
dien Theirbadge
is of gold, composed of a rose, thistic, and shum. rock issuing from a see otre between three crowns, encircled by the motto The end h C B wear the same badge, of a smaller size, hy a red ribbon, and the civil C B



ORDER OF THE BATE.

the same, I ut of a still smaller size, from the button-hole, rendent from a red ribbon. The star of the KC, B is in the form of a cross patche of silver, having the same centre as the grand crosses, but without gold Malters cross thereon. The star of the sivil and dultese cross thereon. The star of the sival k C B is of the same form and size, only contribing the laurel wreath and the Lik dien. The officers of the cider are the deal the gene alogast and blane coursier hereid, the Bath king of arms, the registrar and secretary, the gentleman usher of the couriet red and Brunswick herald, and the messenger

BATHOS LOS HOS (Or, depth), is a term comployed.

BATHOS LOS HOS (Or, depth), is a term comployed.

In Lit to denote an unconcences descent from the subline to the ridiculous from a lotty idea to a mean one; as in the well known lines-

"And thou, Dilhousis, the great god of war Lieutenant general to the earl of Mar"

Lattenant general to the earl of Kar"

Bath Lot lath ki! (Heb, daughter of the voice), the tame given to a species of oracle employed by the Jews, and it quently mentioned in the Talmind. After the death of Milacin, the spirit of prophery ceased among the Jews and they then had recourse to another kind of revelation, called the daughter of the voice, because it succeeded the oracing prophery. It was, in fact a method of divination similar to the Sories Vergliams of the Romans. As, in the latter case the irret words they happened to dipints in the works of that poet were regarded as a kind of exacts, whereby they predicted future events, as with the Jews, when they appealed to Bath-Kol, the first words they head from any one a mouth were looked upon as a voice from heaven, directing them in the master they a voice from heaven, directing them in the master they inquired about Lyen Christians in former times were not free from this supersettion, often making the same use of the bouptures that the Romans did of the works

use of the boriptures that the Romans did of this works of the Mantuan bard
Barus and Wash houses—In the early part of the pissent century the want of proper accommodation in the houses of the poorer classes in large towns and cities for washing clothes and the person, which is so very needful, and eminently conducave to beatth, led many benevolent individuals, of a practical surfact of mind, interested in what is now bettined "social surface," to consider what should be done to remedy the evil. Remembering, doubtless, the public baths, which were deemed the most necessary and important restitutions in Rome and the cities of her interesting dependent provinces, remains of which are to be seen

working classes with the means of chasining a not or cold bath, as well as the me of washing-approprint, for cleaning, drying, and moning lines in a comparatively short period of time. Since sentering the disconfort and unbeasiby designees which must always exist in the dwelling of the arisess, often limited to one or two rooms in a building, or safer berrack, occupied by many families, on days appropriated to the abcessary but most disagreedable process of washing. In 1844 the first practical steps were taken to initiate the movement, and, at a meeting held at the Mansion House, a sensety was formed, under the name of the "Association for Promoting Cleaniness among the same and the same of Mr. Bowe, a surgeou, who was mainly instrumental in bruging about a result of desirable, will always be knoourably connected. Subscriptions having been raised for the purpose, an old suit so desirable, will always be honourably connected. Subscriptions having been raised for the purpose, an old house in Kilasshouse Yard, Upper East Smithfield, near the Lounion Docks, was taken and opened in the following reas, amply furnished with baths, coppers, and the necessary appliances for bathing and washing, where bathers and washers were admitted without charge; and that the boon was fully appreciated by those who lived in the immediate neighbourhood, may be gathered from the fact, that during the first year 64,319 persons awailed themselves of the privileges offered by the association. The society, in 1846, proceeded to exect medel premises in Goulston Street, Whittschapet, the general principles of which, as re-Whitechapet, the general principles of which, as re-gards construction and arrangement, have been closely followed in all other similar institutions. In the same rear snother company erected and opened an establishment in George Street, Euston Square; and an act was introduced and passed (which was amended in 1827), by which, with the consent of the inhabitants, parochial vestries, and town-councils of corporate and belongly towns, were empowered to build public baths and wash-houses, borrowing money for the purpose, to be refunded by payments to be made out of the borrowing or poor-rate. The charges were fixed at 1d. for a cold bath and 2d. for a hot one; and the use of the washing apparatus at not more than 3d. per hour. the washing apparatus at not more than 3a, per nour. The prices for baths of a higher class were not to exceed three times the sum charged for the lower class. Many parishes in London promptly availed themselves of the advantages offered under this act; that of St. Martin-in-the-Fields being the first to do that of St. Martin-in-the-Fields being the first to do so. This example was quickly followed in Liverpool, Manchester, Bristol, Birmingham, and many of the more important towns in the United Kingdom; and shortly after the closing of the Great Exhibition in 1851, the governments of France, Sweden, and Belgium, and the municipal anthorities of many continuits, as well as New York, having seen the benefits resulting from such establishments in England, and the information on the practical varying of the applied for information on the practical working of the scheme, and statistics connected with it, with a view to the erection of similar institutions in their own capitals and towns. There are about twenty of these capitals and passes in London, and about 2.000 000 hathers and \$500.000 washers take advantage 10,000 bathers and 500,000 washers take advantage of the accuramodation offered in these, at an average cost of rather more than 3d. each. With the exception of the institution in Goulaton Street, which commenced operations hampered by a heavy debt, the baths and expenses, or nearly so; and there can be no doubt that all will become fully self-supporting in the course of a few years. It has been found that persons belanging to the middle classes avail themselves of the convaniences offered by the wash-houses to a much preser extent than the poor, for whose benefit these preser extent than the poor, for whose benefit these contablishments were intended; which is to be regratted, as the primary end simed at by the original promoters of the movement thereby falls short of attainment; it shought, however, that funds might be produced by affording better accommodation; and obarging higher rates, for those who are possessed of better means, which would enable the managers to open a third class. which would enable the managers to open a third class for the scorest people gratuitously, or at a nominal struct. In the classes. The following is a general description of the Rhine at Graticianal Paintes in these establishments. The baths of both cissess are placed in a large open room, rescribing a shad, lighted from openings in the roof and abound in a compling a shad, lighted from openings in the roof and objects these for man are placed on one side of Bombay.

g, and those for women on the other. partition, generally of these about 10 feet high; the best, which is for the most pure made of size or trong, and holds from 50 to 60 gallons, being in some eases and helow the level of the flow, and in others above in Hot or cold water can be supplied by an attendant, as the bather may order, by means of a contrivance placed in each room for the purpose of allowing him to make his requirements known. Two towels are generally allowed for a first-class bath, the charge for which is 64, hot and 3d, cold; and one for a bath of the second class, which may be had for 56, hot and 56, cold. Soap may be purchased of the attendants who aupfly the towels. At some of these satallishments shower and vapour baths are to be found, as well as auggly the towels. At some of these establishments shower and vapour baths are to be found, as well as large swimming baths filled with topid and ould water. The washing-rooms are similar in construction to those containing the baths, being divided into fower of compartments resembling stalls in a stable, each being shout 8 feet long by 33 wide, by also partitions about 8 feet bigh. Each division contains a wooden trough, to serve as a boiler, and a washing-tub, which are supplied with hot or cold water, or emptied, by taps arranged for the purpose: steam is admitted into the mooden botter whenever it is desired to make the water boil. The bottom of the compartment is covered with a wooden The steam arising rack, on which the washer stands. The steam arising from the ranges of boxes is carried off to a ventilatingshaft. The clothes are dried in a wringing machine made of galvanized wire, to which a rapid rotatory motion is imparted by turning a handle, the water being driven out by centrifugal force. After being wrang, the clothes are taken to a room called the drying chamber, also divided into compartments and heated with hot air : each compartment is farnished with a horse, on which the linen is hung: it is generally quite dry in about a quarter of an hour. Some institutions have a room provided with hoards covered with finnel, irons, and stoves, for ironing. Soap and sode must be provided at the expense of the washers. The use of the apparatus in wash-houses having first-class compartments furnished with a rinsing-table and class compartments furnished with a rinsing same sub-being rather larger in size, is 23d, per hour first class, and 13d, second class; the general charge is, however, 13d, per hour, sithough, in some places, id. only is charged. It is found that two or three hours are sufficient to enable a good washer to wash and dry the whole of the linea used in a small family .- Ref. Euglish Cyclopadia-Arts and Sciences.

BATH STONE. (See COLITE.)
BATIDER, but-i'-de-e, in Bot., the Batis ord. A single succulent and surubby plant, Batis maritima, constitutes this supposed distinct order. It is a native of the West Indies, where it is occasionally used as an ingredient in pickles. The order is closely allied to Empsteration the Crowberries.

BATMAN, baw'-man, in Mil., a soldier who has been told off to perform certain duties which are not the ordinary regimental duties. For instance, when troops are in the field, each field-officer has a batman; the staff have one likewise, and avery company has two These batmen take charge of the horses for carrying the camp equipage. Neither batmen nor bat horses are allowed to troops while on duty in the United King iom.

BATON, ba-tawn(y), (Fr., a staff), is a staff or emb employed to denote dignity or power. If is the name given to the short staff presented by the French sove-reign to each field-marshal on his appointment, so we

indication of his power.

BATRACHIA, Là-trai-ki-a, soft and naked-skinned rep tiles, such as frogs and toads, who in the carly stage of existence respire by means of gills.

existence respire by means of gills.

BARACHO LITES, bai-trai'-ko-lites (Gr. bat-codies, a frog, lithos, stone), in Geol., fessil remains of frogs and other animals of the same order. The striptomy restiges of the soft parts, and imprints of the festiol several genera of true batrachians, occur in the territor structs. In the pincone deposits on the banks of the Rhine at Enringen, and in the paper-soal of the Edds, several species of frog, tond, and next have been found. Fossil fregs of a small species very similar to the recent abound in a dark shale overlaid by basalt, in the whomity of Bombay.

## Batrachomyomachia

BATRACH(MYONACHIA, bill-ra-ko'-mi-o-maf-ki-a (Gr. butraches, a frog; mas, a mouse; mache, a battle), literally signifies a battle of frogs and mice, and is the title of a Greek mock berois posm usually sacribed to Homer, but without any good foundation. It seems to be indeed a parody upon the Hiad; and the contests of the beasts, their single combats, the intervention of the gods, and other Homerio incidents, are described with much humour.

BATRACHUS. (See FROG-FISH.)

(£60) per month; a major's full batta was 456 rupees a captain's, 182; lieutenant's, 122; ensign's, 92. When a captain s, 122; heutenant s, 122; casign s, 12. When a regiment was in garrison or cantonnents within 200 miles of the seat of government, of either of the stree presidencies, only half-batta was allowed the with an addition for house-rent. The effect of the amalgamation of the East-India and royal regiments has been to cause an entire alteration in the system of batta allowances.

BATTALION, but-tall-you (Fr. bataillon), in Mil., is a division of the infantry in an army, commanded by a colonel. Two or more battakions (frequently only one) colonel. Two or more battakons (frequently only one) constitute a regiment; two or more regiments, a brigade; two or more brigades, a division; two or more divisions, a corps d'armée; and two or more corps d'armée, a grand army. A division corresponding to a battalion exists in most of the armies of Europe. The object in a battalion is not to make it too small, and yet not to make it larger than that all the men of it can hear the voice of the commander. The number is resulted from 600 to 1000 man. The Pression and is usually from 600 to 1,000 men. The Prussian and Austrian battalions are, on the war footing, each 1,000 strong, and are in the former divided into four, in the latter into six companies. In the British army a the latter into all companies. In the British army is battalion usually consists of about 750 men; and, in most cases, one battalion constitutes a regiment. During war, however, the British army is increased, not by adding to the inumber of regiments, but by adding battalions to a regiment, and companies to a battalion is groundly divided into the adding battainous to a regiment, and companies to a battailon. A battailon is generally divided into ten companies, each company into two equal parts, and cach of these into sections. The company of grena-diers occupies the extreme right, and the light-infantry company the extreme left of the battailon, while the

other eight companies, each designated by a number, one drawn up between them.

BRITHIN, bill-less, in Mar., signify thin pieces of oak or fir nailed to the mastheads and to the midship part of the yards. Battens of the hatches are a sort of long narrow laths, scantlings of wooden stuff, or straightened hoops of casks. They serve, by the help of nating, to confine the edges of the tarpauling close down to the sides of the hatchways, to prevent the water from penetrating the lower apartments of a ship during a

storm.

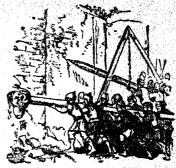
BATTENS.—In Carpentry, this term is applied to pieces of fir-wood about 14 or 16 feet long, not more than 7 inches wide, and 22 inches thick. They are used for making floors, and when off into six lengths they are used as uprights on which to usil laths, where plastering is required. The best battens come from Christiana, in Norway, and an inferior kind is imported from North America.

BATTENING-RAM, bat-ter-ing, a military engine of high antiquity, which wes used for beating down the walls of besieged fortresses. It consisted of a massive beam of timber, with an iron or bronze mass upon one and, generally of the abspe of a ram's head. In its earliest and rudest form it was worked by soldiers, who supported it in their hands. More generally, however,

supported it in their hands. More generally, however, supported it in their names. More generally, however, it was along from a cross-beam, with an alternate extensive surface of coated glass is required. Such a motion communicated to it by means of ropes. It was a tensive surface of coated glass is required. Such a surface may be afforded by one huge jar or by a battery, in many cases covered by a rude form of shed, which served as a protection to those working the ram. Justus are incoavanient and expensive. A battery is formed Lipsius speaks of one battering-ram as 180 feet in by joining together all the charging-rods or inner

# Battery, Electrical

length, a diameter of nearly 23 feet, while the iron head weighed a ton and a half. Supposing this engine to be worked by 100 soldiers, it would acquire a momentum equal to that of a 35-pounder. This very ancient weapon of destruction is mentioned by Ezekiel. Thucydides speaks of it as being used in the Polopon-



BATTEBING-RAM.

nesian war, n.c. 429; and Dionysius the Elder certainly employed it a hundred years later at the siege of Motys. The Romans, who derived it from the Greeks, used it

The Romans, who derived it from the Greeks, used it constantly and with great effect. It was sometimes, but not very frequently, used in the Middle Ages.

BATTERY, batt-te-re (Fr. batterie), in Mil., a number of pieces of ordnance mounted upou a raised platform behind an elevation of earth. A battery of this sort is principally used in order to defend or retain a position. There are, however, many kinds of batteries, distinguished by names, referring either to their podistinguished by names, referring eliber to their po-sition or the duties which they are required to perform. In gun and howitzer batteries, there are embrasures through which the firing takes place; but mortar-bat-teries have no openings. In field operations, a battery teries have no openings. In need operations, obstery mostly consists of six pieces of ordnance, with gumers, horses, ammunition, &c., complete. A battery of footartillery is usually called a field-battery, in order to distinguish it from that of the horse-artillery, which is called a horse-battlery. A field-hattery offen decides a battle. At the battles of Alma and Inkermann, the former was decided when the British troops reached the Russian batteries; and the successful retention of a sand-bag-battery at Inkermann ultimately left the victory with the allied troops.

victory with the allied troops.

BATTERY, in Law. (See ASSAULT.)

BATTERY, ELECTRICAL.—The term usually applied to a combination of several electrical jars, which may be charged and discharged as one great jar. The construction of the simple jar, or Leyden phial, will be fully explained further on (see JAR, ELECTRICAL), but a short description of this important instrument may be given here. It complete of a wide months is a \*\* short description of this important instrument may be given here. It consists of a wide-mouthed jar of thin glass, coated externally and internally with tinfoil to within a few inches of the top, and provided with a wooden cover, through which passes a stout wire connected with the inner coating, and terminating above in a brass knob or ball. Such a jar is charged by connecting the outer coating with the earth, and bringing the knob in contact with the conductor of an electrical machine. To discharge the jar, its necessary to complete a conducting communication between the exterior coating and the knob. The extent of such communication, which is termed an electrical circuit, exterior coating and the knob. The extent of such communication, which is termed an electrical circuit, may be almost indefinite. If the discharge be effected through a short circuit of bent wire, terminating in brass balls, there occurs an exceedingly bright spark, accompanied by a loud snap. If a pertion of the living frame be included in the circuit, then a powerful shock ensues, the intensity of which depends on the amount of the charge. To obtain very powerful effects, an extensive surface of coated glass is required. Such a surface may be afforded by one huge jar or by a battery. Very large area are, however, seldom simployed, as they

# Battery, Floating

coatings of several jars, which are then united externally by being placed on a common conducting-base. When charged from the conductor of the machine, and discharged in the nural way, these jars all set together in mass; hence we have a means of multiplying electrical accumulation to an almost undimined degree, provided we can obtain a sufficient charging power. With a battery of 100 jars, each about 18 inches in diameter, 2 feet high, and exposing altogether about 550 square feet of coated glass, the Dutch electrician Van Marum obtained a tremendous action: when this battery, after tarring been fully charged by a vary large double-plate obtained a tremendous action: when this battery, size that high been fully charged by a very large double-plate reachine, was discharged through and upon various kinds of matter, its force was irrestable. Steel bars, bin. in length, a inch wide, and A th inch thick, included in the circuit, became powerfully magnetic; a piece of boxwood 4 inches aquare was rent in pieces; various metallic substances were melted and dispersed in all directions, an iron wire, 25 feet in length, and about metaline substances were metted and dispersed in an dispersed in an dispersed in an dispersed in length, and about the 1-th part of an inch in diameter, fell, under the slock, into red-hot belle; a piece of tin wire, 8 inches long and 1-th of an inch in diameter, disappeared in a cloud of blue smake, from which fell red-hot globules of the metal. The electrical battery, as sold by the philosophical-instrument makers, is a compact and elegant apparatus. It consists of a number of small elegant apparatus: It consists to a number of smain jars, each occupying a separate compartment, in a strong wooden case lined throughout with tinfoil, all the jars being connected by cross brass rods terminating in balls. Sir W. Snow Harris recommends a much more simple arrangement, in which jars of comparatively large dimensions are employed. Five, seven, or any other convexient number of the jars, are arranged in a group upon a circular conducting base, and the knobs of the external jars are connected with the charging rod of the central jar by short brass wires. If very great power is required, a number of such groups may be united by joining their central jars. The management of electrical batteries requires very great caution. The jars are easily charged by connecting the central rod with the machine, as the charge will then pervade the whole series through the connecting-wires. ingenious contrivances are employed for discharging electrical batteries without danger to the operator. The best of these consists of two insulated balls, one in communication with the inner coatings, and the other with the common conducting base, which balls can be brought in contact at any instant, by touching a glass handle placed at a safe distance from the charged jars. When certain substances are exposed to the action of When certain substances are exposed to the action of the battery, they are placed on an insulating-table between two directing wires, which may be adjusted conveniently for the particular experiment. The in-strument termed the universal discharger is generally employed in such operations. In this, the two directing-rods, slide through short spring tubes supported by glass pillars, with which they are connected by movable joints; the insulating-table is placed between these rods, and is supported by a glass leg, which fits into a socket of compressed cork, in such a way that the table may

or compressed core, in such a way that the time may be maintained at any required height.—Ref. Eudimentary Electricity, by Sir W. Snow Harris.

BATTERY, FOOTING. (See FLOATING BATTERY.)

BATTERY, VOLTAIC OF GALVANIC, an arrangement for producing a current of electricity by chemical action. The two forces electricity and chemical affinity are so intimately connected, that one may be assumed to be either the cause or the effect of the other. The chemical effects which result from the passage of electricity through different substances will be con-sidered under the head of ELECTROLYSIS; and the the head of Biscratchery, Volkaro. In explaining the head of Biscratchery, Volkaro. In explaining the principles of the voltate battery, it will, however, the principles of the voltate battery, it will, however, the principles of the voltate battery, it will, however, the principles of the voltate battery, it will, however, the principles of the voltate battery, as well as the principles of the voltate battery, as well as the principles of the two forces. It is piece of zinc of a number of simple pairs similar to that described a slove, and the two be then plunged in a vessel containing water excludibated with sulphuric soid, the whole arrangement will constitute a simple circuit, or voltate part, in action. The action is dependent on the different chemical efficity of the liquid for the respective with the zinc of the second, the copper of the second metals. It will attack the sinc rather than the copper; with the zinc of the third, and so or to the sale of the plates, by useans of a wire or otherwise, electrical phenomena attending chemical changes, under the head of Electricity, Voltaic. In explaining the principles of the voltaic battery, it will, however,

# Battery, Voltaio

may be considered to commence at the surface of the zinc, or active stances, to be projected through the cliquid to the conject, or another stances, and thence back again by the conducting-wise. Fourtre electricity is assumed, for the sake all simplicity, to be the electricity, and, in common parlance, it is said that the slootic current of every battery in action status from the metal attacked, passes through the liquid to the second metal, or conducting body, and returns by the wire or other channel of communication. It must not be forgotten, however, that a current of negative electricity takes place at the same time in an opposite direction. It is necessary, moseover, to guard against the idea which the term current naturally suggests, or an actual bodily transfer of something through the substance of the conductors, like water through a pipe. The real nature of the phonomena of the voitaic circuit is entirely unknown, and may, penhaps, remain so; still such expressions as electric current, passing so; still such expressions as electric current, passage so; still such expressions as steerie current, passing of electricity, &c., are so convenient, that it would be foolish to reject them; and so long as they are used strictly in a ligarative sense, they are unobjectionable. In every voltaic combination, the passage of the electricity (i.e. the positive modification of the force) in the liquid is from the active element to the inactive the tiguid is from the active element to the inactive element: in the simple circuit above described, for instance, it is from the zinc to the copper. If this simple fact be borne in mind, it will decide in every case the question which confuses so many; namely, which is the positive and which is the negative end of a battery? The positive is the end where the electricity leaves the battery; the negative where it re-enters it. The direction taken by the current being ascertained by the mere inspection of the relative situations of the two elements in a cell, the other points follow as a necessary consequence. Thus, if the wire connecting necessary consequence. Thus, if the wire connecting the copper and zine of the single pair be broken, and the circuit completed by interposing some apparatus between the broken ends, an examination of the arrangement will at once show that as the electricity arrangement will at once show that as the electricity passes from the zinc to the copper, it will leave the battery by the wire attached to the copper, and, passing through the interposed apparatus, will return to the battery by the wire attached to the sine: the copper, therefore, forms the positive end, and the zinc the negative end. The current produced by a simple circuit is too feeble to produce any strking effects; but by arranging a number of pairs in a connected series, in such a manner that the direction of the current shall be the same in each the intensity the current shall be the same in each, the intensity may be greatly excited. The two instruments invented by Volta, called respectively the pile and crosse of espe, depend on this principle. The voltaic pile is never employed now; but as it was the first battery constructed, it may be described here. Upon a plate of zinc is laid a piece of cloth rather smaller than itself. steeped in dilute acid, or other liquid capable of acting chemically on the zine; upon this is placed a plate of copper, silver, or platinum; then another piece of sine, another cloth, and another plate of inactive metal, until a pile of about twenty alternations has been built up. If the two terminal plates of such a pile be touched with wet hands, the sensation of the electric shock will be experienced; but, unlike the momentary effect produced by the discharge of au electrical jar, the produced by the discharge of an electrical for, the sensation will be prolonged and continuous; and, with a pile of one handred pairs, excited by dilute acid, it will be nearly insupportable. When an extensive pile is insulated, the two extremities will be respectively found in strong positive and negative conditions; and, when convenient in what because the conditions; and, when connection is made between them by wires, armed with points of coke or hard charcoal, discharge

discharge takes place as in the case of the pile. The principle of the compound battery is well seen in this arrangement. By such alternation of sine fluid and copper, the current is urged forwards with increased energy; but, though its inferently is augmented, the actual generity of electrical force, as estimated by the decomposing power of the current, is not increased. The difference between intensity and grantity can only be touched upon here, but will be fully, explained in the article on voltaic electricity. The intensity of a current of electricity, which is increased by multiplying the alternations, is its power of overcoming obsticles and passing through imperfect conductors. The quantity of electricity generated by any battery is measured by the chemical effects it is capable of producing, and is never greater than that developed by the smallest and least active pair of plates. In the crown of cups, the beautiful regularity of action common to all batteries may be observed. Whatever the number of cells, precisely the same amount of action number of cells, precisely the same amount of action occurs in each. The same weight of zine is dissolved occurs in each. The same weight of zinc is unsource in the same time in every cell; and the strength of the electrical current in one part of the cironit is invariably equal to that in any other part. If the zinc forming the active elements be perfectly pure or amalgamated, and have no action muon it while the circuit the dilute seid has no action upon it while the circuit remains broken; but the moment the connection is completed, torrents of hydrogen gas arise from the surface of the copper, while the zinc undergoes oxida-tion and solution. Common zinc is very readily dis-solved by dilute sulphuric acid, owing to the formation of a multitude of little voltaic circles, by the aid of particles of foreign metals, or plumbago, partially embedded in the zinc. This gives rise in a battery to what is called local action, by which much of the metal is often consumed, without contributing in the least to the general electrical effect. This evil may be got rid of by amalgamating the surface. To amulgamate zine place it is merely necessary to place them in a dish containing dilute sulphuric seid, and rub them with a rag, at the same time allowing a few drops of mercury to fall on them. The rubbing will cause the mercury to spread; and it may in this manner be made to entirely cover the whole surface of the plates. They should then be rinsed with clear water, and put uside in a vertical position to allow the excess of mercury to By this means the surface of the zine acquires a beautiful frosted appearance, and local action is prevented. Zinc, either amalgamated or pure, is almost invariably used for the active element in voltaic arrangements; and opposed to it, as the inactive ele-ment, we generally find one of the four metals, copper, platinum, silver, and iron, or the non-metallic sub-stance carbon. Of the many different forms of battery platinum, silver, and fron, or the incurrence stance carbon. Of the many different forms of battery devised since Volts's time, the most noteworthy are those of Cruikshank, Wollaston, Daniell, Grove, Bunsen, Callan, and Smee, which will now be separately described

Cruikshank's Battery.—The apparatus invented by Mr. Cruikshank is a convenient modification of Volta's Mr. Cruikshank is a convenient modification of Volta's originat pile. The zinc and copper plates, instead of being laid one upon the other, are soldered together in pairs, and placed in vertical grooves cut in the sides of a malogany trough lined with pitch. Each pair is firmly secured in its groove by cement; and tha whole trough is thus divided into a series of water-tight cells or compartments, capable of receiving the exciting liquid, which may be dilute sulphuric soid or a solution of commands.

or common salt.

of common salt.

Wollaston's Battery.—In this arrangement every copper plate is doubled round a zinc plate, and the two metals are kept apart by pieces of cork or wood; consequently, both surfaces of the zinc are exposed to the action of the liquid, which is contained in an earthenware trough, divided by partitions into as many cells as there are pairs. The zinc of one pair is connected with the copper of the next; and all the pairs are firmly strached to a bar of dry mabogany, so that they can be readily lifted out or plunged into the acid. The great objection to this battery, and to the other contrivances previously described, is the rapid decrease of power. The current, however strong at first, soon becomes west, and, after a certain time, is hardly perceptible. This loss of power may be easily explained. In the first place, the exciting

ford, sulphuric soid, is gradually changed to sulphure of sinc, which has no action on the zinc;—scotsidly, bubbles of hydrogen adhere to the copper, and, of necessity, prevent portions of the metal from being in sound contact with the liquid;—thirdly, the dissolved sinc is partially precipitated in a metallic state on the copper, and thus gives rise to counter currents.

Daniell's Battery.—The first constant battery,—that is to say, an arrangement capable of maintaining a remain current for many hours,—was devised by Pro-

regular current for many hours,—was devised by Pro-fessor Daniell. Each cell of this battery consists of a copper cylinder, 33 inches in diameter, and of a height varying from 6 to 18 inches. In this copper cell, which forms the inactive element, is placed a cell of porous carthenware; and in this is suspended the active element, which consists of a rod of sine 2 of an inch in ment, which consists of a rod of sine # of an inch, in diameter, carefully amalgamated. The porous cell, when moist, offers little resistance to the passage of the electrical current, but effectually prevents the de-position of zinc upon the copper. It is filled with a mixture of one part, by measure, of sulphuric acid, and eight of water; while the exterior space is filled with the same liquid enturated with sulphate of copper. A little perforated shelf or colunder is fitted to upper part of the outer cell, and on this crystals of upper part of the outer cell, and on this crystals of sulphate of copper are placed, so that the strength of the splution may be kept up. The copper cylinder and zinc rod are provided with binding screws; said, when a communication is made between them by wices, a current is produced, the intensity of which may be augmented to say degree by connecting a sufficient number of cells, on the principle of the crown of oups, the copper of the first being statched to the zinc of the second. Ten such cells constitute a very powerful apparatus, which has the great advantage of retaining apparatus, which has the great advantage of retaining its energy for a lengthened period. When the circuit is incomplete, the dilute acid exerts no action on the zinc; but, directly the opposite poles are connected, action commences. The zinc is slowly dissolved, white at the same time metallic copper is deposited on the at the same time metallic copper is deposited on the surface of the copper forming the outer cells; and as long as the solution of sulphate of copper remains saturated, there is no evolution of hydrogen. By this admirable arrangement the principal defects of the ordinary zine and copper battery are removed; for, in the place of hydrogen and metallic zine, pure copper is alone deposited on the inner surface of the

copper cell.

Grove's Battery.—In this, the most powerful of all voltaic arrangements, platinum is used for the inactive element, and the evolution of hydrogen at its surface element, and the evolution of hydrogen at its surface is provented by the oxidizing action of uitric acid. A single cell of Grove's battery consists of a vessel of stoneware, within which a cylinder of amalgamated zine is placed; and this surrounds a porous cell containing a slip of platinum-foil. To excite the battery, strong nitric acid is put into the porous cell, and dilute sulphuric acid into the outer vessel. With a series of ten or twelve cells, the electric light between charcond points may be exhibited with great brilliancy. When the platinum slips are only 2½ inches long by 1 inch broad, and the zincs 4 inches high by 2½ in diameter, four cells decompose water rupidly, and give a current four cells decompose water rapidly, and give a current of sufficient power to heat a fine platinum wire to redness. The battery is very compact and portable, and to a great extent constant in its action. The zinc. as in the case of Daniell's battery, is only consumed while the current passes; so that the apparatus may be arranged an hour or two before it is required for nee. The nitric acid suppresses the whole of the hydrogen, becoming thereby slowly deoxidized and converted into nitrous acid, which at first remains dissolved, but after a while begins to be disengaged from the porous cells in dense red times. This constitutes the only serious drawback to Mr. Grove's

excellent apparatus.

Bunsen's Battery.—This form of battery, which is much used on the continent, resembles that hat described, save that the inactive elements in contact with the nitrie acid are formed of carbon. They are made of various shapes, by heating in proper moulds a strongly-compressed mass formed from a mixture of powdered coke and caking coal, rendered plastic by

strong syrup.

Callan's Maynooth Battery.—This is another modifi-

cation of Grove's battery, in which cast-iron is substi-tuted for platinum. The most brilliant effects may be produced by means of a large sumber of sinc and iron pairs; and the cheapness of both metals renders such a battery accessible to those who cannot afford to invest

much money in platinum plates.

Sizes's Bottery.—For most practical purposes this apparatus may be advantageously used. It is less apparatus may be advantageously used. It is less powerful than most of the arrangements already described, and, in constancy it is decidely inferior to Daniell's battery; but the ease with which it can be constructed and repaired, the fact of its only requiring one exciting liquid, and never evolving any unpleasant or oppositive wapour, render it a most valuable and convenient instrument. Each cell contains three plates, two of active and one of inactive metal. The two active plates are of amalgamated zine, and are tightly clamped to a wooden frame by a screw, which, being of brass, survey to connect them electrically. The inactive plate is a thin sheet of platinized silver, and is held in the frame between the two zincs. Before platinizing the silver, its surface is roughened by a momentary immersilver, its surface is roughened by a momentary immer-sion in nitric soid, or by placing it between two pieces of sand-paper, and subjecting the whole to pressure. The silver thus prepared is then attached to a wire connected with a plate of zinc in a porous cell, and immersed in an outer cell which contains dilute sulphuric acid mixed with a weak solution of chloride of platinum. By pouring weak sulphuric acid into the porous cell, an electric current is produced, and finely-divided platinum is precipitated on the silver, just as copper is deposited in the electrotype process. (See Kleckstyre). The particles of platinum attached to the silver facilitate the liberation of hydrogen when the plate is used in the battery. Instead of adhering to the metal and interrupting the action, the gas escapes with a loud hissing noise. To excite the battery, a mixture of one part, by measure, of sulpluric acid, and twelve parts of water, is employed. This ingenious contrivance was appropriately named the chemico-mechanical battery by its inventor. (For a full account of the uses of the

BATTLE, bit-if (Fr. butaille), in Mil., is a hostile en-counter between two large bodies of troops or two armies. In early times a battle was a flerce tumultuous contest between bodies of men, without order or discipline, the issue of which depended upon the physical strengthor courage of the combatants. Gradually, however, the superiority of discipline, united effort, and the ase of improved implements of war as opposed to mero physical strength, began to be seen, and led to the changes that have since taken place in the training of armies and the conduct of engagements. The issue of a battle now depends upon a variety of circumstances, which renders it always a matter of difficulty to deter-mine beforehand what may be the result. These cir-cumstances are constantly changing; and sometimes events, that no human wisdom could have foreseen, may occur in the course of a battle to defeat the wisest plans and the most skilful arrangements. It is wisest plans and the most skilmi arrangements. It is
in force-seing and providing for the various circumstances of each particular case that the great skill of
a general consists; and though he may meet with
occasional reverses, in the long run, success is generally
on the side of him who forms his plans with the greatest
sagacity, and executes them with corresponding vigour
and ability. It is the skill of the general, rather than the courage of the soldier, that now determines the event of a battle. There is, perhaps, no position that calls for greater mental qualities than that of a general during a battle. With a consciousness of the

divided into three periods,—the disposition, the com-bat, and the decisive moment. The general first examines the strength, reconnoires the position, and endeavours to learn the intention of the enemy. He ought to know the nature of the enemy's ground, as well as his own; the atrong or weak points which it resents; by what local advantages his own finnits can be supported, or those of the enemy attacked; and also be acquainted with the weak points of his own and his antagonist's disposition; so that he may be prepared to strengthen the one or to assault the other. It forms part of the tactics of a good general to make the enemy conform to his plans, and to avoid the necessity of having to conform to the plans of the his opponent. If the enemy concest his position and plans, skirmishes and partial assaults are often advisable, in order to disturb him, to obtain a view of his movements. to induce him to advance, or make presents; by what local advantages his own flanks can of his movements, to induce him to advance, or make prisoners, from whom information may be obtained. presents; from whom internation has no chanted.

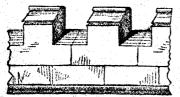
According to the knowledge thus acquired, and the state of the troops, the plan of the battle, or the disposition, is made. Dispositions ought to have for their object to insure at once solidity and mobility; and hence they ought neither to be too extended nor too deep. The plan of the battle itself, the position of the deep. The plan of the battle itself, the position of the troops, &c., is called the order of battle. When each division of troops has taken its position and received its orders, then comes the second period,—the combat. It commences either on several points, at a given signal, as is the case when the armies are very large, and a general attack is intended, or by skirmishes of the light troops, which is most commonly done. Before the battle the general relaxes bimself upon an alexance. the battle, the general places himself upon an eleva-tion from which he can see the coullict. The plans and orders of a general reach only to a certain point; the commanders of battalions must do the great work of the battle. They ought, therefore, to have as much knowledge of the business of the day as will enable them to vary their movements according to circumstances, when in such situations as that the commander himself cannot direct their operations. The commander-in-chief receives the reports of the generals under him, and gives orders from time to time; disposes of the troops not yet in action; strengthens weak points; throws his force upon the enemy where he sees him waver; or changes, if necessary, with a bold and ingenious thought, the whole order of battle. He sometimes sends one of his nides-de-comp to take instant command of the nearest body of cavalry, in order to execute an order which must be carried into effect quickly. The general also uses every means to bring on the third period,—the decisive moment. This cannot always be the result of calculation; it often takes place hauch sooner than was expected, and is often protracted by accidents or want of energy. Sometimes the operations are drawing to the end which the general simed at, when an unforescen accident suddenly gives a new impulse to the enemy. Everything depends upon a moment,-upon a thought; and the skill of the general is shown in the use he makes of the one, or the means he has at command for carrying out the other. Perhaps it is all-important to break at once the enemy's centre; to pour down cavalry in a certain direction, or to concentrate the fire of artillery upon a certain point. When the enemy begins to waver or retreat, it is of the utmost importance to follow up the victory with every possible vigour and dispatch. Of the numerous battles that have taken place there are a few that stand prominently out as having had a material effect on the world's subsequent systems a carring a cattle. With a consciousness of the great issues that depend upon him at that trying moment, smid scores of tremendous agitation and bloodshed, he must remain firm and collected, carefully observing the movements that are going on, ready to circumvent the intentions of the enemy, and to take advantage of any favourable circumstance that may present itself. Battles are either offensive on the cattle with its offensive on the content of course, a battle which is offensive on the content of course, a battle which is offensive on the content of course, and state which is offensive on the content of the Kleman legions under Yarus, A.D. 9; 6, the totatle of Chalons, 45; 7, that of Tours, 732; 8, that of Hastings, 1006; 9, Joan of Arc's victory over the Rigilant of astrong position, without snyother object than that of maintaining it against him. In offensive operations again, the enemy is sought for, harassed, and attacked on the first favourable opportunity. A battle is usually

#### Battle

Barras, or Barras.—Trial by a wager of battle,—a species of judicial combat formerly practised by individuals, and sanctioned by law in the Middle Ages. Any person accusing another of a crime was admitted to prove it by witnesses or by single combat. Although in England the right prevailed, it had fallen into desuctude; but it was unexpectedly revived in a celebrated case, which was the cause of its being shokished. In 1817 a young maid, Mary Ashford, was believed to have been violated and murdered by Abraham Thornton, who in an appeal claimed his right by his wager of battle, which the court allowed; but the appellant (the brother of the maid) refused the challenge, and the accused escaped, being ordered "to go without day," 16th April, 1818. The argument before the court of King's Bench occupied several days; and, as the case brought out a vast amount of research as to the history of duelling and judicial combat, and is well worthy the attention of the antiquary sud historian, we cannot do better than refer the reader to it. It will be found in 1 Barnewall & Alderson's Reports, K.B. 405. See also Chauncey's "Historical Antiquities of Hertfordshre," \*\*sib evel. Baldock, in 1nd. The statute 59 Geo. III. c. 46, abolished this right of appeal

BATTLE-AXE, bat'-tel-ax, an ancient military weapon of offence. This weapon, which appears to have been of offence. It is weapon, which appress to have been used from the most remote periods in warfare, was made in two forms. The first had a single edge only, and was similar to the modern hatchet; the second had two edges, and was sometimes called the Amszonian axo, from a supposition that weapons of this bind ware mad by the founds warrious. Axes were kind were used by the female warriors. much employed as offensive weapons by the Cultic and Scandinaviau nations. Among the Roman armies the battle-axe was not much used; it was considered the weapon of uncivilized nations. At the siege of the Roman Capitol by the Gauls, Brennus is represented as being armed with a battle-axe; and Ammianus Marcellinus, several centuries afterwards, describes an armed body of Gauls as being all furnished with battleaxes and swords. In the Bayeux tapestry the English are represented as using the buttle-axe. The pole-axe was introduced by the Normans; it had an edge on one side and a sharp point on the other. In the year 1415, at the battle of Agincourt, the Welsh infantry employed this weapon in order to dispatch those whom the archers had wounded with their arrows. torian Burns describes the Irish as being constantly armed with an axe. At the battle of Bannockburn, King Robert Bruce clove an English champion down to the chine at one blow with a battle-axe. The Beauto the chille at one ollow with a matter are. The fresh fettiers, or Beef-eaters as they are unigarly termed, were originally armed with this weapon. It was also used at an early period in naval warfare for the purpose of cutting the ropes and riggings of vessels. The battie-are fell into disuse towards the close of the 16th century.

BATTLEMENT, but-tel-ment, in Arch., a wall or parapet on the top of a building, with notches or indentures, in the form of embrasures, to look through or to disolarge missiles from, for the annoyance of an enemy. The rising parts of the parapet are called enerious or copes, and the open spaces are called creviels, loops, or embrasures. The purpose of the con-



DATTLEMENT.

trivance is, that a soldier may shelter himself behind the merion while he shoots or observes the enemy through the crenels. The derive is of great antiquity: it has been found represented in various forms in the bas-reliefs of Ninevel and Lycia, and in the Egyptian paintings, and exists in many remaining walls and

## Baxterians

towers of the Greeks and Romans, besides those of the mediaval period. Battlements were also largely gives to exclesisational and civil buildings in the Middle Ages by way of ornament, where they are often richly panelled or pierced with circles, trefoils, quatrefoils, dec. Out fortifications, the battlements are generally quite plain, or pierced only with a very narrow cruciform or upright opening, the ends of which sometimes terminate in, circles called asillets, through which archers could take aim. Sometimes the coping on the top of the appearance of a pierced parapet. The use of this ornament is almost entirely confined to the English styles of Gothic architecture.

BATTLE-PIECE, bill-tel-peece, in Paint, a picture which represents a battle, exhibiting large masses of mee in action. A painter of battle-pieces ought to have an accurate knowledge of the appearance of horses and amen, and, if possible, to have seen a battle. The armour of the anciente, and the whole array and action of their battles, afford subjects more favourable to the artist than the straight lines, condensed columns, and firearms of the moderns. Some of the greatest pieces of this kind are the battle of Constantine, of which the cartoons were drawn by Raphael, and which was executed by Giulio Romano; Lebrnu's battles of Alexander; and the battles of the Amazons by Rabens. From these may be distinguished the skirmishes, surprises, &c., which have been represented with so much skill by Antonio Tempesta, John Snellink, Jos., van der Velde, John Asselva, Peter Sneyders, Robert von Hock, Palcone, called oracolo delle battaglie, Horace Vernet, Edwin Landseer, and Others.

Bartur, hill-too (Fr. battre, to beat), an expression

BATTIE, bill-too (Fr. buttre, to beat), an expression used to denote an unsportsmanlike method, adopted by owners of large extates in the autumn and whiter months, of killing a great quantity of game which has been preserved for the purpose. The wholesale slaughter is unaccompanied by any exhibition of the skill that may be shown, or endurance of fatigue that must be encountered, in the pursuit of game in a fair and legitimate way. A party of ten or a dozen gentlemen, each with two gams, which are loaded for them by attendant keepers, surround a copse or plantation in which a great number of phessauis, bares, and rabbits are known to harbour. Men armed with long sticks are then sent in, who beat the bushes in all directions, which causes the game to quit their retreat and make for other covers. As they come out into the open space, they are shot down in all directions as fast as the guns can be discharged. Sometimes the owner of the estate derives a considerable annual sum from the sale of the game shot at these periodical battues.

BAUHINIA, baw-hint-i-a (so named by Plumier, in honour of the brothers Baulin, botanists of the 10th century), in Bot., a gen. of plants belonging to the nat. ord. Leguminose, sub-ord. Casalpinies. The species are natives of the warmer regions of both hemispheres. Most of them are twining plants, which stretch from tree to tree in tropical forests, like living cables; but a few are small trees, with erect self-sustaining stems. The leaves are generally divided into two equal lobes, which circumstance is said to have suggested the idea of naming the genus after the two brothers. The flowers of some are large and very beautiful; but they rurely show themselves in the bethouse. The genus contains several very useful species. Thus B. paroilore, racemosa, and validit yield tough fibres employed for making ropes; B. retusz and emarginatu each produce a kind of gum; B. variegata has an astringent bark used in medicine, and for tanning and dyeing leather; the buds and dried flowers of B. tomentosa are also astringent, and are much employed by the Indian doctors in dysenteric affections. The snaken rod of Æsculapius is said to have had its origin in a portion of the stem of A. scanders, which had twined around a smaller stem. The Mopané-tree of South Africa is a species of Baukinia. During the heat of the day the leaves of this tree fold up and become almost erect, so as to afford but little shade to the sun-oppressed traveller.

BATERIANS, burde-vi-ins, in Eccl. Hist., is a term applied to those who adopted the peculiar theological tenets of Richard Baxter. His system was liberal and conciliatory. He attempted to unite the different accts

## Bay

and parties in the Church by moderate and conciliatory measures. By striking into a middle path between Calvinism and Arminianism, he endeavoured to reconcile both creeds. He held with Calvin that the merits of the six death are to be applied to believer only; but he sho asserted that all men are in a state capable of salvation. In his desire to conciliate all, and in the many modifications, concessions, and alterations that were extorted from him by men of different religious tenets, he sometimes incautiously showed himself to be more Calvinistic than Calvin, at others more Arminian than Arminius.

BAY, bai (Fr. baie), in Phys. Geog., an erm of the but smaller than a gulf, and larger than a creek. The term is, however, often applied to large tracts of water around which the land forms a curve, as Hud-

son's Bay.

Bay. (See Laurus.)

Bayaderes. (See Bajaderes.)

BAYBURES. (See BAIADERES.)
BAYBUX TAPESTEY, bai-yu(r), (Fr. tapis, carpet), a long piece of cloth, or rather canvas, 214 feet in length and 20 inches broad, preserved in the Hôtel de Ville at Bayeux. It is embroidered in coloured yarns, with figures of men, animals, houses, ships, &c., with a border above and below the central portion, formed of emblematic devices; and forms a pictorial history of the events which preceded and brought about the conquest of England by William I. It is divided into eventy-two compartments, each bearing an inscription in Latin explaining its subject; and many of the figures have the names of the persons they are intended to represent attached in the same language. It contains represent attached in the same language. It contains 1,512 figures in all; namely, 623 men, 202 horses, 55 dogs, 37 houses, churches, and castles, 41 ships and boats, 49 trees, and 505 smaller animals, birds, and sphinxes, principally in the borders. It is supposed to have been worked for the cathedral of Bayenz, under the superintendence of Matilda, the queen of William the Conqueror, and presented to his brother Odo, the bishop of that place, as an acknow-ledgement of the services he had rendered in the conquest of England. It went exactly round the nave of the building, where the ecclesiastical authorities, according to Ducarel, in his "Anglo-Norman Antiqui-1767, were accustomed to hang it up on John's day in every year, and allow it to remain there for the eight days immediately following: but, from



COOKS-PROM BATEUR TAFFETRY.

the inventory of the various things belonging to the cathedral taken in 1476, it seems probable that it was originally suspended round the nave on October 15, originally suspended round the nave on October 15, the day on which William won the battle of Hastings. M. Lancelot, in 1724, was the first to call attention to this elaborate piece of needlework, having found a coloured drawing of a portion of it in the library of M. Foucault, formerly intendant of Normandy. He communicated his discovery to the Academy of Inscriptions and Belles-Lettres, and showed its evident commettion with the events of the Norman conquest.

## Bayeux Tapestry

which appeared in 1730. It narrowly escaped destruction at the hands of the meb during the French revolution, and shortly after was brought to Faris, and exhibited there by order of Napoleon. When it was sent back to Bayeux it was kept rolled up on a large wooden roller, but it may now be seen, protected by a continuous of them in the public library. In 1816 continuous cases and the second of the second o covering of gluss, in the public library. In 1816 careful drawings of it were made by Mr. Stothard for the Society of Antiquaries, which were published in vol. vi. of the "Vetusta Monumenta." It has been a matter of discussion whether it was worked by Matilda, queen of William the Conqueror, or Mailide, empress of Germany, the daughter of his son Henry I.; but there is much evidence in the tapestry itself to show that it wassembroidered shortly after the occurrence of the events it is intended to commemorate. The following is a brief summary of the principal scenes in this pic-



ERRYANTS CARRYING UP DINNER-FROM BAYEUR TAPKSTRY.

torial history, which affords invaluable information to the archeologist and historian, respecting the manners, customs, costume, mode of warfare, &c., at the time of the Conquest. In the first compartment Harold is shown taking leave of Edward the Confessor prior to Blown taking learn of Normandy. He is then seen quitting Boseham, in Sussex; and, having crossed the Channel, he lands in the territories of Guy, earl of Ponthieu, by whom he is detained as a prisoner. Messengers come from William of Normandy to Guy and Harold; and the release of the latter is ordered. Guy conducts Harold to William, who brings him to his palace. Harold then renders assistance to William in his quarrel with Conan, earl of Bretagne. The flight of Conan to Bennes is shown, the attack of the Normans on Dinant, and the surrender of the town. William rewards Harold's services by a present of armour, and the two proceed to Bayenz, where Harold swears to aid William in his project of gaining the English crown on the death of Edward the Confessor. Harold then returns to England, and is shown relating his adventures to Edward, whose death occurs shortly after-wards. The people offer the crown to Harold, who accepts it, regardless of his oath to William. The appearance of a comet betokens some disastrous event likely to befall him. The news is conveyed to William who holds a consultation with Odo, and orders instant preparations to be made for the invasion of England. The embarkation of arms, men, and stores, and the bassage of the Norman troops, are next depicted; their passage of the vorman troups, are next depicted; their landing at Pevensey and march to Hastings, and the subsequent fortification of a camp, and the erection of a castle. The coming of Harold and his army is made known to William; and the Norman soldiery are shown laying waste the country with fire and aword. The approach of the hostile armies, and the results of the reconnoitring on either side, are next shown; and William appears addressing his soldiers previous to the conflict. Next comes the battle of Hastings, with the episodes of the death of Harold's brothers Lewine and Gurth, the prowess of Odo, the shughter of Harold's body-guard, and the fall of Harold himself; and the work is finished with the total defeat and rout of the Saxon army. It is supposed that it was originally in-tended to continue the history up to the coronation of somestion with the events of the Norman conquest.

This led to a search for the original, which was found in the extended to continue the anisry up to the original, which was found shruptly broken by its termination at this point, the embroidery is complete, and bears no marks of having in the work of the French antiquary Fère Montfaucon, had any portion destroyed,—Bel. Vetusta Monumente,

### Bay-Leaves

vol. vi.; Pictorial History of England; Bruod's Bayeax Tupestry Elucidated.

BAY-LEAVES.—From remote antiquity bay-leaves have been used in the customs and ceremonies of various nations. An honorary grown or wreath composed of these leaves was bestowed as a prize on men who were distinguished for any literary or military ment. Thus Spenser.—

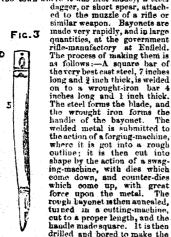
"So him they led through all their streetes along, Crown'd with garlands of immortal baies; And all the vulgar did around them throng To see the man whose everlasting praise They all were bound to all posteritie to raise."

There was a superstition that bay-leaves were able to protect the wearer in a thunderstorm. And in an old play, called *The White Devil*, there are the following lines:—

"Reach the buys;
I'll tie a garland here about his head,—
'Twill keep my boy from lightning."

The fading of bay-leaves was looked upon formerly as an omen of death. At the present day they are used along with other evergreeus in decorating houses and churches at Christmas. They are also used for flavouring in cookery.

BAYONET, bai'-o-net (supposed to be derived from Buyonne, the town where it was first made), a steel



socket-handle hollow, shaped



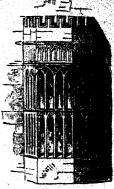
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bent a little at the neck, and then hardened and tempered. Before it is quite complete, the hayonet has still to go through a variety of minor processes. The first bayonets were used in France in 1671 and were called bayonet-a-monche: they had handles which first bayonets were used in France in 1671 and were called bayonet-a-monche: they had handles which fitted into the muzzles of they mus. Bayonets -d-monited of sbort daggers, which the infantry were in the habit of slocking into the muzzles of their muskets when attacked by earaly. The use of pikes went out as the value of the bayonet began to be appreciated. The bayonet, as an oftensive weapon, has been of great importance in modern warfare; and the bayonet-charge, in which every nation thinks that it excels, is one of the most terrible mancourres of infantry soldiers. The sword-bayonet is a more modern invention, and, when detached from the gun, can be used as a weapon by itself. With respect to its different parts, the blade is shown at 1: 2 is the hilt; the quard and ring are marked & 4 is the spring which secures the sword to the rifle; the scabbard of the wespon is shown at 5.

### Beaches

BAY-WINDOW, Arch., a window which forms a bay or recess in a room. It may project outwards from the wall either in a rectangular, polygonal, or semicircular form, which latter has often been incorrectly termed a box-window. Windows of this kind are very common in the Perpendi-cular style. Examples of them may be seen in the halls of the colleges at Cambridge and Oxford, as well as in the old halls of the English nobility and gentry. Chancer makes the following allusion



BAY-WINDOW.

"With bay-windows, goodly as may be thought."

BAZAAR, or BAZAR, ho-zar', is a term derived from the Arabic, and literally signifies the sale or exchange of goods. Among the Turks and Persians t is applied to a market-place, either open or covered, where goods are exposed for sale, and where merchants meet for the transaction of business. The name has recently been adopted in London, Paris, and other great cities, and is applied to places opened for the sale of various articles, chiefly fancy goods.

Bazoche, of Basoche, ba-zosh', a French term, the exact etymology of which is rather doubtful, but most agree in considering it a burlesque translation of the Latin word basilica, a royal palace. When justice was administered in the royal palace of the French kings, the judges, notocates, procurators, and others who were connected with this department, were termed cleres de la bazoche. Afterwards, when the administration of justice became a separate department, a distinction was made between those noblemen who formed the royal train, and were called courtiers, and those connected with the court of justice, who were called cleres de la bazoche, or basochians. But as the term bazoche implied the having a king, a mock one was appointed, who had his officers of state, court, and other paraphernalia of royalty. In the beginning of the 14th century Philippe le Bel conferred on this community certain important privileges. Henry III. suppressed the title of king, and conferred the rights and privileges attached to that office on the chancellor. Still the bazoche continued to exist as a body, and retained its pomp and its forms. It met twice a week, and heard and decided all processes and debates that srose among the clerks. At public festivals the bazochians took a prominent place; and at the carnival they united themselves to the prince of fools, and took part in the setting of low farces and mysterics. In their turn they acted a kind of satirioal morality, in which they took great liberties in railing at the vices of the ago, and in insulting the favourites of fortune. This naturally produced a great outery against them, and at length, in 1540, they were entirely suppressed.—Ref. Encyclopédie des Gens du Monde.

BRELLIUM. (See BALSAMODENDRON.)
BRACH, beech (Ang.Sax.), in Geog., a shelving tract of sand or shingle washed by the sea or a freshwater lake, interspersed between the water and the land on which vegetation grows. The sea-beach is the space between low and high water-mark, particularly that part of it which is dashed by the waves; and the beach of a lake lies between the highest and lowest water-marks

of its ordinary level.

Braches, Raisen.—Banks of sand and shingle, with shells, found following the bays and recesses of the coast, at various heights above the existing beach or see-margin. These give evidence of either elevation of the land or depression of the cocan, and point to

Beacon

Beagle

times when sea and land stood at these successive levels Along the coasts of Great Britain there are several notable examples, at heights about 10, 20, 40, and even 60 feet above the present sea-level.

Bracon, bee-kee (Sax. beach, a sign; beaching, to

Bracon, bee-kon (Sax. becon, a sign; becomin, to lanks a sign to, the name given in former times to signal-fires lighted on the tops of hills or any elevation that could be seen from a great distance, to convey intelligence of the approach of an enemy, or any other desired information, by preconcerted signs. Heacontess are of great antiquity, being mentioned in Jereman vi. 1, and by the Greek tragedian Æschylus, in his "Agamemnon," as conveying the intelligence of the fall of fleoy to the Greeks. In England, the beacons were formerly piles of faggot-wood, but afterwards pades were erected, to which iron pots were attached, filled with pitch and other combustibles. Intelligence inica were erected to which iron pois worth intelligence was speedily conveyed in this manuer: the become was speedily conveyed in this manuer: the become and speedily conveyed and speedily conveyed and speedily conveyed to the control of the con the frontier between England and Scotland were always securious between ingiana and spottand were always carefully watched, and, in the reign of Elizabeth, a line of beacons was erected on the headlands and hills on the south coast, to signal the approach of the parish Armada. Lord Macaulay, in his ballad on this subject, describes in forcible language how the company of the Spottands described the southern of the Spottands described in the southern of the spottands and the southern of the spottands are supported in the southern of the spottands and the southern of the spottands are spottands and the southern of the spottands are spottands and the spottands are spottands and the spottands are spottands and the spottands are spottands are spottands are spottands are spottands and the spottands are spottands are spottands. mass subject, describes in forcible language how the names of the coming of the Spaniards' feet was flashed from Plymouth to London, and round the eastern coast, in the dark night, the red blaze of beacon after beacon springing from hill, and down, and tower, rousing the slumbering might of England into lite and action. These iron beacons were often erected on church-towers, and one is still to be seen on the tower of the parish church of Hadler in Middleser — In of the parish church of Hadley, in Middlesex.—In Mar., a beacon is an erection at the entrance of a Mar., a neacon is an erection at the entrance of a harbour orriver, to indicate sunken rocks, sand-banks, or parts where navigation is dangerous. It is generally a pole secured by chains to the rock on which it is placed, with a large ball formed of iron hoops at the top. Vessels auchored in certain places, exhibiting lights at night, are called floating beacons. The lighthouses built at various points to render navigation less hazardous are also beucons. (See Lighthouse.)

BEAD, bede, in Arch., a small moulding whose vertical section is semicircular, sometimes cut into pearls and other ornaments in Grecian and Roman architecture, in which it is more frequently used than in the

BEADLE, or BEDEL, beed-del (Sax bydell, a messenger; Fr. bedeau; Span. bedel; Du. bedelle).—Junius derives it from bidd, beadan, to hid, to tell, to order; because he proclaims and exercises the will of his superiors. In this sense, bishops, in some ancient superiors. In this sense, bishops, in some ancient MSS, in the Saxon tongue, are called bedels of Gra MSS. in the Saxon tongue, are called bedets of Good (Obei bedelli). The term beadle, as now commonly accepted, is an officer chosen by the vestry of a parish, and whose business it is to attend the vestry, to give notice of its meetings to the parishioners, and execute its orders. The church beadle was formerly a kind of verger, whose station, in the 13th century, was at the door of the church, his dress being, as now, a blue gown. The name has since been changed, and he is now called a summoner or apparitor. universities, the bedel is an officer who walks before the masters at all public processions, &c., with a mace.

the masters at all public processions, &c., who a nance. Brans, backs (Ang.-Sar.bcde, prayer), among Roman Catholics, are small balls of glass, ivory, or other substance, strung upon a thread, and used to count the number of prayers repeated. The beads are distinguished by their size and shape; the larger ones being for Paternosters, the smaller for Ave-Marias. (See BOSARY. A beadenan is a prayer-man, one who prays for smother; and a bidding of the beads is a charge given by a priest to his parishioners, at certain times, to say so many Paternosters upon their beads for a soul departed:—

\* Tell your beads, says the priest, and be fairly trussed up

For you surely to-night shall in paradise sup."

pan heated to dull redness, and stirred about till they assume, a rounded form, from their edges becoming partially melted. When cool, the sand and charcoal, which have prevented them from collapsing, is descred out. Bugle-beads are simply cylinders of glass four or first times their diameter in length, which are out from a long tube, and used without any further preparation. Beads are also made of various hard seeds by drilling a hole through their centre. They are also turned from coral, ivory, bone, amber, and hard woods. Beads of all kinds are much used as articles of commerce in trading with savage nations, by whom they merce in trading with savage nations, by whom they are much sought after for purposes of ornament. Heads were anciently much used as ornaments, and are, at least, as old as the Egyptians.

BRADS, ST. CUTHDERT'S, a popular term for the detached head-like joints of the fossils called excinites (which see). They are found in great abundance on many parts of our coast. The legend associating St. Cuthbert with these fossils is thus alkaded

to by Sir Walter Scott :-

"On a rock by Lindisfarne, St. Cuthbert sits and toils to frame The sea-born beads that bear his name."

Bragle, bee'-gl, a small hound, more remarkable for perseverance than speed, employed in hare-hunting. The precise history of the beagle is involved in some obscurity. By Skinner the term is derived from the French bugler; and Menage is of opinion that as the hound was sent from Britain into Gaul, the name may be of British origin. Says Blaine, in the "Ency-clopedia of Rural Sports," "there are even now several varieties of lesgles, but formerly there appear to have been several more, from the deep-flewed diminutive type of the old southern bound, to the fleet and elegant foxhound beagle; to which may be added the pigmy breed called landog beagles. Beagles were formerly distinguished by the rough and the smooth. The rough wire-haired, or terrier besgle, is now seldom met with, though it was a hardy and altogether a vermin-loving breed, and very strongly formed. We were once traveiling on horseback along a turnpike-road, when our cars were struck with a screeching, and the unmusical



BEAGLE.

zaille of a pack of full-sized rough beagles, and we shall not easily forget how gallantly they rushed through both hedges, and how true to the line they carried the seent across the next field. We were told, on inquiry, that 300 guiness had been refused for this pack. North country beagle is a nimble and vigorous bound: the pursues the hare with impetuosity, giving her no time to double; and should the seem lie high, he will with ease run down two brace before dinner. Colonel Thornton, an eminent English sportsman, owned a Thornton, an eminent English sportsman, owned a valuable breed of minute lapdog beagles, and George IV., while prince of Wales, was in the habit of hunting with packs of well-selected dwarf beagles. Another well-known English sportsman, the late Colonel Hardy, once had a pack of beagles amounting to ten or twelve couples, and so diminutive in size that they were always carried to and from the sporting field in a large pair of panniers slung across a horse. This curious pack was not to the according weekles required to the couple of the second in which we have the second in the second Brads.—The manufacture of beads is carried on principally at Murano, near Venice, and at Birmingham. Glass tubes, of different colours, are first drawn out to various sizes; they are then chipped into small cylindrical pieces, which are put into a mixture of sand and charcoal, and stirred about until the boles in them are filled; they are then placed in a state of the panuiers stolen; and notwiththe boles in them are filled; they are then placed in a standing the most diligent search, no trace of either

would ever be discovered .- Ref. Blaine's Encyclopadia

of Rural Sports; Brown's Anecdotes of Dogs.
Braz, or Braz-Brad, beek, that external part of a ship before the forecastle which is fustened to the n ship before the forecastle which is fastened to the stem and supported by the main-knee. It was made of wood and brass, and nilited to the prow, for the purpose of damaging the vessels of the enemy. Since the invention of gunpowder, these strong projecting pointed beakers have fallen into entire disuse, and teak-head now signifies a small platform at the forepart of the upper deck, generally placed the same neight from the deck as the port-sills.

Branders, beel-kers (Ger. becher).—Glass vessels of a cylindrical shape, well annealed, and perfectly even in their substance, used by chemists for boiling or heating solutions. They should be very this, and without any purity-mark, or inequality at the bottom. Brand, been (Sax. beam, a tree).—The beams of a ship are strong thick pieces of timber, stretching across the ship from side to side to support the decks and

the ship from side to side to support the decks and retain the sides together. The main-beam is next the mainmast. The greatest beam of all is culled the midthin beam. When a ship inclines so much to one side that her beams approach to a vertical position, she is said to be on her beam-ends. In the measurement of a ship, the term beam is used to signify oreadth at the a sup, the term beam is used to signify breadth at the wales. (See Tonnage.) In mayal affairs, "on the starboard beam" signifies any point out at sea which, viewed from the stern, is at a right angle with the keel, and upon the starboard or right side of the ship. In like manner, "on the larboard-beam" signifies on the larboard or left side; "on the weather-beam" signifies that side of the weather-beam." signifies that side of the vessel which is towards the

BEAM, in Arch., may be either a large piece of timber or metal used for sustaining a weight, or to counteract two equal and opposite forces. Generally, it is the largest and principal piece in a building; and one of its most common uses is to support the main rafters.

BEAM-COMPASS. (See COMPASS.)

Bram-Engine.—A steam-engine which communi-cates motion by the top of the piston-rod, being con-nected with a beam or lever moving on a central pivot, the other end of the beam being in similar connection with the crank of the driving-wheel. In the directaction engine no beam is used, the piston working the crank.

BEAM-TREE. (See PYBUS.)

HEAN, been (Sax.), the common name for several le-guminous plants yielding pulse. These will be described under the names of the genera to which they belong; under the names of the genera to much they belong; thus, for bread-bean, see Faba; kidney-bean, scarlet-runner, and haricot (Phaseolus); ordeal-bean (Doli-Chas); Tonquin-bean (Different).

Bran-Caper. (See Zugorbullum)

Bran-Kang, in the early customs of this country,

was the title of the person who was chosen as king of the social festivals on the evening of the Twelfth-day. The mode of election is thus described :- A cake baked with a bean and a pea concealed in it, and is divided among the company present, when he that receives the bean is king of the cerumones, and she that has the pea is queen. (See Twelfelder.)

" Now, now the mirth comes, With the cake full of plums, Where bean 's the king of the sport here; Besides, we must know The pea also Must revell as queen of the court here." Herrick's Hesperides.

A like custom prevails in other countries. In France the twelfth-cake is plain, with only a bean, the drawer of the bean being king or queen of the feast. In Germany, the feast of the Three Kings (in allusion to the wise men of the East), on Twelith-night, is of a similar kind, and attended with similar ceremonies.

BEAR, buir (Ursus).—Bears are generally inhabitants of the wooded districts of mountainous countries. and occur in all parts of both hemispheres, with the exception of Australia. Of all the carnivora, they are the most omnivorous in their diet, some of them living

bear; but, more than all, he delights in honey, to rebear; but, more unb an, ne uniques in many as a stable he strongholds of wid bees, though not uncommonly compelled to beat a retreat before the tiny sting-bearers. Generally, the bears are large heavy animals, with an awkward and shuffling gait. Their auterior limbs, however, are also and admits their descriptions. and shuffling gait. Their anterior limbs, however, are possessed of considerable mobility, and, despite their bulk and great weight, they exhibit great dextorfly is climbing. The bear was not so meanly treated by our climbing. The bear was not so meanly treated by our sancestors as by us; by them, his strength and fiercesess were acknowledged, and a stone castle was built for his lodging. To bait him with savage mastiffs was thought Ilt game to set before the king; and, to this end, th were founded, at Southwark, in Paris Gardens, as it is still called, two circular buildings, somewhat after the style of the ancient Roman amphitheatre. The buildings were unroofed, and contained tiers of seats buildings were unrosted, and contained tiers of seats for the company, with a pit in the centre. The admission to the ordinary part of the bear-garden was one halfpenny. In the reign of James I. it was under the protection of royal patent, granted to the holders "for the sole practising and profit of the fighting and combating of wild and domestic heasts in England, for the term of fourteen years." Edward Alleyn, the celebrated actor and founder of Dulwich College, enjoyed this patent for several years. The practice of granting a bear-fighting license was abolished in 1642, and the hear-master for the time being committed to Newgate for the crime of threatening to cet the tbroat of any man who voted his bear-garde at the strong "Wild" man who voted his bear-garden a nuisance."-Wild Sports of the World. The feet of the bear are armed sports of the World. The text of the bear are arrand with formidable curred claws, equally available for tearing a carcass or digging up a root. In the grisly bear (Ursus ferox) these claws possess the singular property of independent action, each separate claw being as capable of distinct movement as the fingers of the human hand. The strength of this lastmentioned animal is so prodigious, that it can bear off a cover him or the strength of the start. an ox or bison weighing a thousand pounds. Should it find a carcass, and, being already full, have no immediate appetite for it, the grish bear will dig a pit and bury it. This propensity to bury is very peculiar. and bury it. This propensity to bury is very peculiar. Bear-hunters suddenly overtaken by the animal have stretched themselves along the earth and feigued death; whereon the shaggy sexton has immediately set about excavating a pit, into which the hunter was rolled and covered with earth. It is said that wolves, however famished, will not touch a body buried by a grisly bear, though they will devour any and the vilest offal chance may throw in their way. Another peculiarity of the animal in question is, that he does not hug his prey. His claws are broad, of great length, and edged like a chisel. Eyeing the object of attack intently for a moment, he rushes at it, rears, and strikes with his tremendous fore-paws. Sir John Richardson mentions the case of a hunter who was completely scalped, the skull being laid bare, and the hair turned right over the face, by a blow of the grisly bear's paw. The polar bear equals in size and strength the grisly bear; indeed, Lanont, the most recent of Arctic explorers, was assured by the Spitzbergers that a full-grown polar bear would attack and kill a bull walrus three times its own size; stacts and kill a bull walrus three times its own size; the bear's hunting tactics being to conceal itself belind anics-hillock, and watching till the walrus came floating past, spring on its back, and helding on by its teeth to the creature's neck, batter in the skull with repeated blows of its tremendous fore-paws. The polar hear, whose whole life, almost, is passed on the slippery ice, has the soies, as well as the rest of its feet, covered with hair. The respect with which, in some countries, the bear is treated is very curious. When the Lap starts on a bear-hunt, he doe's so with When the Lap starts on a bear-hunt, he does so with as great a show of solemnity as if he were going to the funeral of a dearrelative. When the bearis discovered, and the attacking party are driving at it with their spears, they, the while, chant a supplication that the spears, any, the wine, count a supplication that the bear will not take it amiss, and imploying him not to hurt them. There is no such thing as rejoicing over the death of their cuemy. They are airsid even to mention him by name, and allude to him, when obliged, as the old man in the fur cloak." Sir John Richardson relates a story of an old Indian and his wife, who, while sitting on the bank of a narrow stream, looked up to a mon-strous bear facing them on the other cide. Having no almost entirely on animal food. Roots, berries, worms, strous bear facing them on the other ride. Having no thesects (especially ants), are equally relished by the weapon wherewith to attack the animal, the Indian

made an appeal to its better nature. "Oh, bear made an appeal to its better nature. "Oh, bear," said he, "I uever did you any harm; I always had the highest respect for you and all your relations. Pray go away and do not molest us." And the bear went away, moved, as the Indian firmly believed, by his eloquence. Captain Lyon has furnished the tollowing account of the hybernation of this species of bear, derived from an Esquimaux. At the commencement of winter the pregnant she-bears are very fat, and siways solitary. When a heavy fall of snow sets in, niways solitary. When a heavy fall of snow sets in, the animal seeks some hollow place in which she can lie down, and then remains quiet while the snow covers lie down, and then remains quiet while the snow covers her. Sometimes she will wait until a quantity of snow has fallen, and then dig herself a care: at all events, it seems necessary that she should be covered by, and lie amongst, snow. She now goes to sleep, and does not wake until the spring sun is pretty high, when she brings forth her two cubs. The cave by this time hus become much larger, by the effect of the animal's warmth and breath, so that the cubs have room enough to move, and they acquire considerable strength by continually sucking. The dam at length becomes so thin and weak, that it is with great difficulty she extricates herself, when the sun is powerful enough to extricates herself, when the sun is powerful enough to throw a strong glare through the snow which roofs the den. The Esquimaux aftirm that during this long confinement the hear has no evacuations, and is herself the means of preventing them, by stopping all the natural passages with moss, grass, or earth. The natives find and ki'l the bears during their confinement by means of dogs, which scent them through the snow, and begin scratching and howling very eagerly. As it would be unsafe to make a large opening, a long trench is cut, of sufficient width to enable a man to look down and see where the hear's head lies, and he then selects a mortal part into which he thrusts his spear. The old one being killed, the hole is broken open, and the young cubs may be taken out by hand, as, having tasted no blood, they are then very harmless and quiet. Sir Emerson Tenneut relates, that among the Cingalese there exists a belief that certain charms are efficacious in protecting them from the violence of bears; and that those accustomed to expose themselves to encounters carry a talisman, either attached to their necks or enveloped in the folds of their bair. (Ceylon, vol. i.) The black bear of America (Ursus americanus) is smaller than most of the family. Its head is narrower than that of the common brown bear, its ears wider apart, its muzzle more prominent, and it lacks the depression over the eves. The fur is comit lacks the depression over the eyes. The fur is composed of short smooth hairs, which are of a glossy black for the greater part of their length, instead of comparatively grizzled fur of the brown bear.— a value vame arranged to the sain of the black bear, -a vame that has very much decreased, for the skin that once totohed from twenty to forty guineas is now worth scarcely as many shiftings, -and the high esteem in which the Indians held their flesh, caused great havor amongst them. The importation into England in 1783 was 10,500 skins, and ascended gradually to 25,000 in 1808, since which time there appears to have been a considerable decline; as, in a table of exports and imports of skins into Great Britain, published in the catalogue of the first Great Exhibition, the number of bear-skins is 9,500. Of these, 8,000 are again exported; so that the annual consumption in Great Britain is 1,500 only. It is chiefly used in this country for military purposes; as for caps, pistol-holsters, &c. For this reason the animal is frequently called the "army" bear. Inhabiting the Cordileras of the Audes, in Chili, there is a bear called the Byectaded bear (Urans ornatus), on account of two semicircular marks round the eyes, reminding the beholder of spectacles. This naimal is entirely black, with the spectacles. This animal is entirely black, win the exception that its muzzle is tawny yellow, and the upper part of the breast inclined to grey. The Syrian bear (Urune syriacus) is probably the oldest on record. This hear it was that averaged the scoffing of the children at the prophet Elishs. The colour of the Syrian bear is stated by some to be brown, and by others to be white, spotted with fulvous white. These children's however, are supposed to have been occa-Dear (Draws syrtaces) is processly the collect on the present. This hear it was that averaged the scoffing of day to let the entire beard grow, when mearning, for the children at the prophet Elishs. The colour of the Syrian bear is stated by some to be brown, and by estimation among the Jews, as is is until the present to be white, spotted with fulvous white. These charges, however, are supposed to have been occasioned by the abrasion of the long hair, whereby the most solemn out of a Jew or a Mahomedan. Nearly would for beneath becomes exposed. It is a ravenous all the Eastern peoples prided themselves upon the

beast, and will without accuple attack and destroy the smaller mammalia. The sloth bear is one of the most singular of the family. When first introduced to this country, about sixty years ago, it was supposed to be a sloth, and was so named. Bewick, in his "Quadrucountry, about sixty years ago, it was supposed to no a sloth, and was so named. Bewick, in his "Quadrupede," gives a portrait of the sloth bear as an animal that had hitherto escaped the observation of naturalists. It is about the bulk of the brown hear; but its ragged-looking hide gives it the appearance of heing larger. The fur of the sloth hear is black, with here and there some brown spots, and two white streaks under the side of the sould under the side of the neck, bearing some resemblance under the side of the neck, bearing some resemblance to the letter V. The cartilage of its nose is capable of extension, and the lips of considerable protrusion. Its food consists of wild fruits, honey, and white ants; and it generally selects for its home some rocky and solitary cavern. The bear family constitutes a natural group of the Plantigrade mammalia. It is characterized by six incisor and two canine teeth in each jaw; twelve molars in the upper, and fourteen in the lower jaw; heavy body, covered with a thick woolly coat; a large head, terminating in a prolonged snout, with very extensible lips. The tongue is smooth, the ears of moderate size and rather pointed. The feet are all pentadactyle, or five-toed, armed with strong claws, well suited for burrowing. The tail is short. Despite their enormous physical power, the bears exhibit but a small carnivorous development.

BEAR, To.—To bear down upon the enemy, to have the advantage of the wind; or being to windward, to approach the enemy by sailing large, or from the wind. To bear in with the land, implies to stear a ship towards the land; to bear off from the land, signifies to steer a ship from the land, lest she should accident-ally run aground when under sail. To bear up, or bear away, is to change the course of a ship, in order to make her run before the wind after she had

sailed some time with a side wind. To bear a hand, implies to make haste, to use dispatch.

Bear, on the Stock Exchange, is a term applied to one who, having sold stock or shares which he does not possess, is anxious that such securities should de-cline in value, so that he may be embled to buy at a profit. The term is said to take its origin from the atory of the man who sold the bear-skin before he had killed the bear. The term bearish is also used to denote a man's opinion that prices will fall,

BEAR-BEATURG. (See BAITING.)
BEAR-BERRY. (See BAITING.)
BEAR-GARDEN was the name given to the place where, formerly, bears were kept and publicly baited; and in the present day it is sometimes applied to a well the place of the place where, for the place where, for the place where, for the place where the place where

rude, turbuleat assembly.

BRAE-LEADES .- Formerly at fairs and country festivities one of the great attractions was a dancing hear, which was muzzled and led about by a man who was called the bear-leader. The practice is now abolished on account of its dangers. The term of bear-leader, on account of its dangers. The term of bear-leader, however, is still applied in a facetious sense to a tutor or guardian who takes charge of a young man of

wealth or title in his travels.

weath or title in his craves.

Beard, beerd (Aug. Sax.), the hair growing upon the chin, and other adjoining parts of the face, in man; and sometimes, though very rarely, in women. It is thicker than the hair of the head, but longer, when suffered to grow, than the hair on the other parts of the body. It is usually of the same colour as the hair of th head, but always the same as that of the eyebrows. The beard is most abundant among those of the Cancasian race; and many persons, natives of Africa, America, and Australia, have little or no beard. The earliest notice on record regarding this manly ornament is in the Bible (Levit. xix. 27), where the lawgiver of the Jews warns them not to "mar the corners" of their beards, but to let them grow after the Egyptian fashion, leaving a little tuft of hair at the extremity of the chin. These Hebrews, who are as tenacious of ancient customs as the Chinese, continue to the present

fashion and form of their beards; and we have it expressly on record, that the Assyrians and Persians indulged in very long beards; and that often, and particularly their kings, they interwove the hair, the lower lip, and chin, with matted gold.—(See St. Chrysostom, Opera, xi. 378, ed. Monf.; Hill's Ottoman Empire, p. 48, 1709; and Layard's Ninevek and Persepolis. p. 45, 1709; and Layard's Niseveh and Percepolis.)
A good many of the ancient Egyptians, and particularly their kings, are often figured in the delineations of them which have come down to us, as entirely without beards. Beard-cases were often, as in the Memon's head in the British Museum, employed to conceal all the hair that was permitted to grow on the faces of this people. Among the Greeks, and especially among the Greek philosophera, this ornament was held in high estimation. Athenœus tells us that the Greeks were the beard until the time of Alexander the Greeks who ordered his Manedonian soldiery to sheep it. who ordered his Macedonian soldiery to shave it off, lest the growth of it might give a ready handle to their enemies in battle. Philosophers have nearly always affected the beard as a mark of gravity, and even venerableness; and Strabo tells us that the Gymnosophists of India wore it long. Socrates and Plato were honoured with the distinction of "bearded master" by their pupils; and the origin of the proverb, ek pogon of sophof (wise men, from their beards), arose from this class of wise men among the Greeks indulging always in this ornament. The Romans were the beard until the 5th century A.C.C., when Publius Ticinus Mens brought over a colony of barbers from Sicily to exercise their profession on the Roman chins. Augustus, and the Roman emperors till Hadrian, shaved their beards; and Plutaroh says that Hadrian allowed his to grow to hide the scars on his face. All the imperial personages after Hadrian grew their beards. It was customary, on the assumption of the toga virilis among the Roman youth, to consecrate the flust-fruits of their beards to some deity. Homer and Wirell Chambines and Blief the recovers Pletarch Virgil, Chrysippus and Piny the younger, Plutarch and Strabo, Diodorus and Juvenal, Perseus and Pru-dentius, all celebrate this ornament on the faces of persons distinguished for the length or whiteness of their beards. The most curious story of long beards their beards. The most curious story of long beards is that of a Middle-Age personage, John Mayo, the bearded by pre-eminence, who was an exceedingly tall man, and nevertheless, when he untied his beard, it flowed down upon the ground; and the emperor Charles V. is said to have been greatly amused by the wind making it fly in the faces of the lords of his court. The Lombards (or Longbeards), the early French, the ancient Britons, and the Anglo-Saxons after they con-quered Britain, all nourished the growth of their beards with peculiar care. The English clergy by and by (see Knight's History of England, vol. i. pp. 136 and 165), probably in imitation of those of Western Europe, began to shave the beard, and until the time of Wil-liam the Norman, the whole of whose army shaved the ham the Norman, the whole of whole army shaved the beard, there prevailed a bearded class and a shaven class, a laity, in short, and a clergy in England. When Duke William conquered England, he insisted rigor-ously upon carrying out the Norman custom of shaving; and he thus constrained many of the high-spirited Britons rather to abandon their country than their whiskers. But by-and-by they got the advantage of their ruthless conquerors; and the higher classes indulged in the moustache, or the entire beard, from the reign of Edward III, down to the time of Charles II. Beards of particular cut were often characteristic of a profession. Thus, there is the steeletto beard, and the profession. Thus, there is the secretar beard, and the spade beard, and the "beard of the general's cut," of Shakespeare. (See Henry V., iii. 6.) Taylor, the "water-poet," in his odd, humorous way, thus speaks of the beards of his time in his "Whip of Pride"—

Some like a spade, some like a fork, some square, Some round, some mowed like stubble, some stark bare,

Some sharp, stiletto-fashion, dagger-like, That may, with whispering, a man's eyes outpike."&c.

In the reign of Charles II. the entire face was often shaven; sometimes aslight moustache was tolerated, and sometimes the whiskers or hair on the cheeks was grown. In France it went out of fashion in the reign of Louis XIII., to be inaugurated again by Napoleon's soldiers. In Russis it was highly fashionable until Peter the 237

Great's time, who cleaned all the faces in his empire.
"But such a veneration," remarks Dr. Giles Bletcher,
"had this people for these ensigns of gravity, that many
of them exercially preserved their beards in their cabinets, to be buried with them, imagining, perhaps, that
they should make but an odd figure in their grave with
their naked chins." During the last fifty years growthe whole heard has become very company it most their naked chins." During the last fifty years growing the whole beard has become very common in most European nations. First the practice began in Bonaparte's army, then it extended to Italy, then to Germany, then to Spain and Russia, and lastly, to England, where it is now very greatly on the increase.—(See the Lexicons of Hoffman and Pitiscus, the English Cycle-

padia, the Encyclopadia Britannica, &c.)
BEARER, bair-er, in Arch., a post, or brick wall, between the ends of a piece of timber, to support it.

BEARING, bair'-ing, in Mar., an arch in the sky intercepted between the nearest meridian and any distant object, either discovered by the eye and re-ferred to a point on the compass, or resulting from sinical proportion. It is also used to mark the situation of any distant object in connection with a ship's position. Sailors often take the bearings of another ship, or some object on shore, to save themselves the trouble of referring to the compass.

BEARING, in Mach., that part of a shaft or spindle which is in contact with the supports. Upon the correct adaptation of the rubbing surfaces to each other depends the value of a machine. If, for example, there should be much friction between the axle of s railway-carriage and its bearings, there would be a large amount of power lost in overcoming that friction. The mechanical force-motion retarded-would, ac-cording to the received theories of the present day, somewhat too hastily adopted, be converted into heat.

It has therefore been the study of engineers to produce bearings which should offer great resistance to pres-

bearings which should ofter great resistance to pressure, and, from their smoothness, produce as little friction as possible.—Ref., Ure's Dictionary of Arts, Mannfantures, and Mines, edited by Hunt.

Brasing Notes.—In the tuning of keyed instruments, harps, &c., bearing notes signify those notes between which the most erroneous or highly-tempered between which the most erreneous or highly-tempered fifth is situate, on which, also, the wolf's said to be thrown. Many tuners begin at C and tune upwards, through the progression of fifths, C, G, D, A, R, B, Gb, Db, and Ab, and then stop, and again at C, the octave above the former note, and tune downwards through the fifths F, Bb; and Eb, and thus the resulting fifth AbEb produces bearing notes, owing to each fifth having been made more or less flat than the extens of twelve notes will have the Leaf term of twelve notes will have the Leaf term of system of twelve notes will bear, the least sum of all their errors or temperaments being the diaschisma. Some tuners are in the habit of throwing their wolf into the fifth Ab, Db, and others into that of Db, Gb.

BEARING THE BELL, an expression conveying the idea of excelling in any art or pursuit. He that takes the lead in anything, or gains the prize in any contest, is said to bear away the bell from the rest of the competitors. The phrase originated from a custom in vogue in the 17th century, of giving a little bell of gold or allver to the winner of a horse-race.

BEASTS OF PARK, or CHASE, are, properly, buck, doe, fox, marten, and roe; but in common and legal sense extend likewise to all the beasts of the forest, which, besides the others, are reckned to be hart, hind, hare, boar, and wolf, and, in a word, all beasts of venery or hunting.—Beasts of warren are hares, conies, and roes.

BEAT, or BATTEMENT, beet (Fr.), a transient grace or ornament in the performance of a note, denoting that a kind of shake is to be made, by beginning with the half-tone below the given note, and quickly repeating the given note and that: on the contrary, the shake maked the affected by beginning on the note. shake marked tr is effected by beginning on the note above the given one (whether a half or whole tone distant), and repeating the given note and it alternately.

BRATTEICATION, be-ut'-i-fi-kui'-shon (L. beatus, happy, and facio, I make), in the Roman Catholic church, is an act by which the pope declares a person beatified or blessed after death. It is the first step to canonization, and no person can be beatified till fifty years after his death. All certificates or attestations of virtues and miracles, the necessary qualifications for saintship, are

Besting

Beauty

examined by the Congregation of Rites; and this ex-amination often lasts for several years; after which the pope pronounces the bestification. The corpse and relics of the future saint are forthwith exposed to the veneration of the superstitious, his image is crowned with rays, and a particular office is set apart for him. Bestification differs from canonization, in that, in the former case, the pope only grants a privilege to certain persons to pay religious worship to the beatified, without determining judicially upon his state; in the latter case, the pope speaks as a judge, and determines ex cathedra upon the state of the person canonized.

BRATING, beet-ing, in Mar., the operation of making progress at see against the wind in a zigzag line, or traverse. It-is generally understood to be turning to

\*windward in a storm or fresh wind.

BEATING THE BOUNDS, -On Ascension Thursday it is an old custom throughout England for the clergyman of the parish, accompanied by the churchwardens, to survey the old landmarks which show the bounda-ries of the parish. In this perambulation they are ries of the parish. In this perambulation they are accompanied by the boys of the parish school and their master. The boys carry willow wands, with which they strike the various boundary-marks. From this practice arises the term "besting the bounds." It was the custom in earlier times to whip a boy or boys at stated places on the boundary-line, in order that the remembrance of the place might not pass away when

he grew up.
BEATING TIME, in Mus., that motion of the hand or foot used by performers themselves, or some person presiding over the concert, to specify, mark, and re-gulate, the measure of the movements. If the time be common or equal, the beating is also equal; as, down, left up right, or one down and one up; if the time be triple or unequal, the beating is also unequal; as,

down, left up, &c.

Bratings. — Those regular pulsative heavings or swellings of sound produced in an organ, by pipes of the same key, when they are not exactly in unison, i.e. when their vibrations are not perfectly equal in velocity, not simultaneous and coincident, which, as Mr. Emerson observes, occasions a repetation of noises like waw, aw, aw, aw, aw, or ya, ya, ya, ya. These are called beats by Dr. Robert Smith, Mr. Emerson, and we believe every other mathematical writer that notices the phenomena. Earl Stanhope, in a letter in the Philosophical Magazine, vol. xxviii. p. 150, has laboured to make a distinction between the meaning of beats and beatings, in order to identify the former with the pulses or vibrations of the sounds themselves, and to denominate the above phenomenou by the exclusive use of the term beatings.

BRATTUDE, be-åt'-i-tude (Lat. beatitude, blessedness), denotes the highest kind of felicity or happiness of which human nature is susceptible,—that state in which the soul attains the utmost excellence and dignity of which it is capable, -the fruition of God in a future

"Above him all the sanctities of heaven Stood thick as stars, and from his eight received Bestitude past utlerance.

The Beatitudes is a term applied to Christ's Sermon on the Mount, from the blessedness that he there prononness upon certain characters of persons.

BEAT OF DRUK, in Mil.—Many of the movements and maneuvres of soldiers are indicated by a particular method of drum beating. There is a great variety of beats, of which the principal are as follows:—the general, giving notice to troops that they are to march ; the assembly, ordering troops to a rendezvous, or to join their colours; the march is the command to move, siveness with the left foot first; the tattoo, or toptoo, is the order to retire to quarters. The réceille is always besten at dawn, and gives notice to the soldiers to rise, to the sentinels to desist from challenging, and that leave is given to come out of quarters. To arms beats when soldiers are dispersed, in order to bring them together; and the retreat is a signal to retire from before the enemy; the retreat is also heaten in camp and garrison a little before cunset, and orders the soldiers to retire to their quarters. The alarm gives notice of sudden danger; and the parley demands a conference with the enemy.

basts; such as the chamade, the long roll, the rogue's march, the pioneer's call, the call to church, &c.

Brays.—The audible phenomenon attending the sounding of two notes at the same time, which sp-proach within certain limits to the producing of a concord with each other, which the late Dr. Robert Smith, in his "Harmonics," has applied with the happiest effect to the practical tuning of instruments, according to any given pratern or arrangements of the seconding to any given system or arrangements of the intervals. The phenomenou of beats forms also the means by which practical tuners unacquainted with theory or the exact comparative magnitudes of intervals, adjust the notes of organs, pisnofortes, harps, &c., by the judgment of their ear, in the daily exercise of the tuning profession.

Bearsonia, beel-so'-ni-d, in Bot., a gen. of plants belonging to the nat. ord. Frankeniacaa. The leaves of one species are used at St. Helena as a substitute

for tea.

Brau, bo (Fr.), is applied to one who pays too much attention to his dress and personal appearance; satirically he has been described as being "a woman in everything but the sex,—a man in nothing except the sex.

BEAUTY, bu'-to (Fr. beauté) .- The Beautiful, the Sublime, and the Picturesque go to form a portion of every theory of taste. No exact definition of beauty has ever been given, and we may be satisfied with a sentence descriptive of it. Beauty, then, is that which gratifies the taste of all. It springs most subtilly from our capacity of enjoyment, or from our sense of the pleasurable; and hence the unparalleled diversity of opinion which has always existed regarding it. The riew which appears to us liable to fewest objections is that of the late Sir William Hamilton, which is as that of the follows. He holds, with Aristotle, that pleasure, from which the sense of beauty ultimately springs, is the invariable concomitant of the unimpeded energy of a power. The most general causes which contribute to raise or lower the intensity of our energies, and, of course, by doing so, to exalt or diminish our sense of the Beautiful, in particular, are, -1. Novelty; 2. Contrast; 3. Harmony and Discord; and 4. Association. Taking up the feelings of man, and viewing them entirely as results or as effects of this energy, there is a contemplative class of them which springs from the combined action of the imagination and of the understanding, which gives rise to the pleasurable emotion which men ordinarily denominate beauty. The feeling of beauty is, then, the result of the combined energy of these two powers, the Understanding and the Imagination. But how de those powers act? The imagination, for example, presents the various objects in various lights to the understanding, which it, according to natural and inalienable law, combines into a whole, or into a unity. In contemplating a building, for example, which is reared pretty high from the magination of the pavement on which we walk, the imagination at once singles out its pillars, and turrets, and pinnacles, which the understanding at once, by leading their various properties up to its natural unity, pronounces the one brautiful, perhaps, and the other, it may be, deformed; and this altogether apart from their subserving any useful function in the building. Let us now step to the other side of the street, and survey the building from this point of view. Here one's eye can take in the whole building; and the mind now, instead of merely dwelling on isolated pillars, &c., hastens to take up the whole in its natural way, and pronounces it a beautiful or ugly design. Now there are various kinds of heauty, both of detail and of com-plexity, observable in this building, which must be dwelt upon, Take a pillar, for example: any one seeing it for the first time would pronounce it absolutely beautiful, irrespective of its having been the workmanship of human hands, and of its being probably designed to adorn and support some portion of a stately edifice. This is the absolute beauty of the pillar. But when it is regarded in all those subordinate lights, or, it may be, only in one of them, this is relative or dependent heauty. It is the latter species of beauty which is variable, not the former. All men admire the arters. The alarm gives absolute heavity of a rose, without being told that it has a three are several other nourishment and propagation of the plant. No doubt, as

Beauty soon as the botanist informs us of these circumstances soon as the botanist informs us of these circumstances, we add this new form of enjoyment, which has accidentally arisen round the rose, to our previous pleasure at its contemplation, and enhance in this way our original perception of its heauty. But, on the former occasion, it was the absolute beauty of the rose which we admired; now, it is the dependent or relative beauty of it. Probably, indeed, the gratification which we feel in the contemplation of a beautiful, of a sublime, or of a nicturescene object, arises from a consideration of a picturesque object, arises from a consideration of the individual object before us. No dependent the mutual topes there are as not uperature feelings, such as those which we have specified, or those of the desire of its possession, or of satisfaction at being the owner of it, should be allowed to interfere, at least with the free analysis of taste. The greater the number of parts in an object which the Imagination to the Understanding and the number of parts in an object which the Imagination holds up to the Understanding, and the quicked the latter power can unify them, the greater will be the pleasure afforded in the exercise, and, costeris paribus, the more beautiful will be the object. Now, this principle not only affords the rationale of what beauty is, it likewise enables us to explain the differences of different individuals in the apprehension of this quality in objects. Thus, if an individual of a quick, vigorous, cultivated mind, be presented to a beautiful scene, there can be no doubt as to his judgment of it; while, if a person of slow, rude, uncultivated nowers, as a boor. person of slow, rude, uncultivated powers, as a boor, be presented to the same scene, he will likely take no interest in it, or, it may be, he may pronounce it posi-tively ngly. It is this principle, acting under the pecu-liar law of association, which explains all the diversities of tasta between a Chinese and an Englishman, for example. Peculiarities of climate or of historical association, &c., combine themselves with the native sense of taste of each nation; so that, what one would call beautiful, another would call deformed; and what one would designate peculiarly agreeable, another would say was particularly ugly. It is, besides, another law of taste, that it is quite a different thing to separate a of taste, that it is quite a different thing to separate a whole into its parts, and to separate a whole into its lesser wholes. Thus, nothing but disgust would be produced if we would think of anatomizing a beautiful face into its integuments, muscular fibres, and bloodvessels, &c.; while we can readily analyze the same face into its various features of brow, eyes, nose, cheeks, and mouth, and, it may be, put those different parts together again with more delight than we analyzed them. The feating of neasure in the Sublivia is lyzed them. The feeling of pleasure in the Sublime is essentially different from the feeling we experience of the Beautiful In the latter, one enjoys unmingled pleasure; in the former, this pleasure is mixed with pleasure; in the formula, and plant Magnitude is an essential condition of sublimity, whereas with beauty it is an impediment. The vast, the wild, the formless, are often sublime, while they are by no means beautiful. Sublimity is three-fold,—the sublime of Space, the sublime of Time, and the sublime of Power. The Picturesque again stands in somewhat of a similar relation to the Beautiful as the Sublime does. When the imagination and the the Sublime does. When the imagination and the understanding, combined, cannot get forward to that ultimate unity in which they rest in the case of the unitiate unity in which they rest in the case of the Beautiful, and are yet, nevertheless, allured on to make the attempt, but always break down among the endless varieties which such objects are apt to involve, such an object is designated picturesque. And it is to be remarked, that it is generally those minds who have a greater love for variety than unity that love the picturesque. They are rather men of a postical than of a signifific temperature that delicated who have a greater love for variety than unity that love the picturesque. They are rather men of a poetical than of a scientific temperament, who delight as curious old bridges, in old gnarled trees, in ruined towers, and in quaint buildings. Such is an outline of the most complete theory we have of the Beautiful, &c., not entirely unobjectionable, yet more so than any one else. The following is a rapid view of the various theories which have been propounded on the subject by men of distinction in their various walks. St. Augustine, who wrote an express treatise on the the subject of men of distinction in their various wans, St. Augustine, who wrote an express treatise on the Beautiful, which is now lost, distinguished this quality from the useful, and ascribed it mainly to the intellectual unity given to objects by the mind. Crouzas, who cut up Pope's "Essay on Man," and at whom Pope sneered in turn in his "Dunciad," held that it depended sneered in turn in ms." Dumbian, ment ame it appeared on the five elements of variety, unity, regularity, order, and proportion. Pers Andlé accepted these elements, but distinguished them into essential, natural, and 239

artificial. Lord Shaftesbury, author of the "Characteristics," ascribed this feeling to an internal sense, while Hutcheson, of Glasgow, who followed Shaftesbury closely, said nearly the same thing. Dr. Gerard, of Aberdeen, said it depended on a natural variety and uniformity, to which Dr. Reid added the quality of novelty. Burke, who wrote a special treatise on the subject, said that all objects appear beautiful that have the power of producing a peruiar relaxation of our nerves and fibres, and thus inducing a certain degree of hodily language and sinking. Diderot, of the Escaof bodily languor and sinking. Diderot, of the Ever-clopedie, said that it arose from the idea of relation, and the beauty of an object was in proportion to the number and the clearness of the relations suggested or perceived. Père Buffier held that it consisted in mediocrity or conformity to that which was most usual. Alison, in his book on Taste, made all beauty depend on association; and Lord Jeffrey followed in his wake. Payne Knight modified this doctrine considerably by Payne Knight modified this doctrine considerably by introducing the primitive and natural beauty of colours, sounds, &c. Kant ascribes it wholly to the judgment; and Cousin ascribed it to the reason acting under the forms of unity and variety. Dr. Thomas Brown said that it was pleasing as an emotion, and that it was always identified with the object that excited it. Thus we have nearly every possible form of this doctrine maintained by men of eminence. Some say that it is a judgment, others make it a feeling; some say that the longer wholly to the mind thinking, others that it belongs wholly to the mind thinking, others that it belongs wholly to the object thought about; some make

belongs wholly to the object thought about; some make it simple, while others make it complex; some aver that it is original, while others declare that it is derived. The theory of the Pleasurable, briefly described in this article, is the only one we know which vindicates its own truthfulness by explaining the phenomenon.

Brayen, bee-ner, that part of the complete helmet forming the lower part of the front-piece, which, with the avantaille, completed the vizor. When the avantaille was raised and the beaver lowered, the whole face was uncovered; when arranged in the contrary manner, the face was completely guarded. The avantaille covered the face from the chiu upwards till it met the nose; the beaver from the chiu upwards till it met the avantaille. Either could be opened independently of the other. When it was desirable to obtain a freer circulation of air, to eat or drink, while preserving the incognito, the beaver was lowered, as most accurately described by Sir Walter Scott, when Ivanhoe, in the Sir Brian de Bois Guilbert, calls for a bowl of wine, and quaffs it to the confusion of all foreign tyrants. When a knight wished, by disclosing his features, to make himself known, he raised the avantaille of his

BRAYER (Castor Fiber), a rodent animal easily dis-tinguished from the reat of the order by its peculiar tail, which is of a nearly oval form, horizontally flattened. The usual length of this animal is about three feet, exclusive of its caudal appendage. In colonr, the beaver is reddish brown, sometimes deepening into the heaver is reddish-brown, sometimes deepening into black; the hair is of a glossy and smooth nature. The hind-feet are webbed, and adapted to the element in which the animal usually lives. The incisor teeth are remarkably hard and sharp, and act like a chisel. According to Sir John Richardson, the Indians always used these teeth to cut bone and other substances, until the introduction of iron caused their disuse. The same authority says, "When the beaver cuts down a tree, it gnaws it all round, entting it, however, somewhat higher on the one side than the other; by which the direction of its fall is determined. The atumo is the direction of its fall is determined. The stump is conical, and of such a beight as a beaver, sitting on his hind-quarters, could make. The largest tree I observed cut down by them was about the thickness of a man's thigh, that is, six or seven mehes in diameter; but Mr. Graham says that he has seen them out down a tree which was ten inches in diameter." The sagacity and industry of the beaverhave been the favourite theme of naturalists from the time of Buffon to the present day. As food the beaver chiefly profers the bark of trees and such shrubs as the willow, poplar, and birch. It will eat berries in the summer. It hays up stores of food for the winter in the same manner as other rodents. This winter supply mainly coneists of the hard and the same for the same manner as other rodents. bark and branches of trees. The northern part of

Bed

NorthAmerica is the great breeding-place of the beaver, and it is there found in considerable numbers. Some thousands of their skins are annually imported into this country. When the beavers are numerous, they are found to inhabit lakes, ponds, and rivers, as well as those narrow creeks which connect the numerous lakes with which North America abounds; but the two latter are chosen by them when the depth of water and other are chosen by them when the depth of water and other circumstances are suitable, as they have then the advantage of a current to convey wood and other necessaries to their habitations, and because, in general, they are more difficult to be taken than those that are built in standing water. The materials made use of are driftwood, green willows, birch, and poplars, if they can be got; also mud and stones intermixed in auch a manner as must evidently contribute to the strength of the dam; but there is no other care or method observed in constructing the dams, except that the work is carried on with a regular sweep, and the work is carried on with a regular sweep, and all the parts made of equal strength. The boaver-houses are built of the same materials as their dams, and are always proportioned in size to the number of inhabitants, which seldom exceeds four old and six or eight young ones. Instead of order or regulation being observed in rearing their houses, they are of a much ruder construction than their dams; for, not-withstanding the sagacity of these animals, it has never been observed that they aim at any other convenience in their houses than to have a dry place to lie on; and there they usually eat their victuals, which they occasionally take out of the water. So far are beavers from driving stakes into the ground when building their houses, that they lay most of the wood crosswise and nearly horizontal, and without any other order than that of leaving a hollow or cavity in the middle. When any unnecessary branches project inward, they cut them off with their teeth, and throw them in among the rest, to prevent the mud from falling through the roof. It is a mistaken notion to suppose that the woodwork is first completed and then plastered; for the whole of their houses, as well as their dams, are, from the foundation, one mass of mud and wood, mixed with stones if they can be pro-cured. The mud is always taken from the edge of the bank, or the bottom of the creek or pond, near the bank, or the bottom of the crock or pond, near the door of the house; and though their fore-paws are so small, yet it is held close up between them, under their throat. Thus they carry both mud and stones; while they always drag the wood with their teeth. All this work is executed in the night; and they are so expeditious, that in the course of one night they will collect tious, that in the course of one night they will collect as much as amounts to some thousands of their little handfuls. As they are frequently seen to walk over their work, and sometimes to give a flap with their tail, particularly when plunging into the water, this has, without doubt, given rise to the vulgar opinion that they use their tails as a trowel, with which they plaster their houses; whereas that flapping of the tail is no more than a habit, which they always preserve, even when they become tame and domesticated, and more

BEAVER-TEER. (See MAGNOLIA.) BERYUR-TREE. (See MAGNGIA.)
BEBRERU, or BEBREU. (See NECTANDRA.)
BEBRERU, or BEBRERINE, be-be-rise, in Chem., the
term applied by Dr. Rodie, of Demorstra, to as alkali
extracted by him from the bark of the bebeera-tree.
Von Planta and Messrs. Madagan and Tilley have
determined its true formula, which is CPMPRIOC.
Its characteristics are that of a highly fibrage and

hitter substance.

BRCALM, be kam' (Du, kalm), in Mar., a term used to denote the position of a ship at sea when there is no wind stirring, or when the current is intercupted by some object so as to render the ship's sails useless. In this state she lies like a log in the water, because, having nothing to propel her, she can move neither forwards nor backwards. One of the great advantages of a steam-vessel is that she cannot be becalined; for if there be no wind to fill her sails, she can always be

worked by her engines.

worked by her engines.

BECCAFIGO, or BECCAFICO, bek-ka-fee'-ka (Ital., the fig-pecker), the Sylvia hortensis, is a migratory songbird, which feeds upon insects, figs, currants, and other fruits. It is a migratory bird with a very short body, very nearly the size of a linnet. During the summer it is a visitor to England, and even Scotland; but it always departs for a southern climate in Sepbut it always departs for a southern climate in September. Its voice resembles that of a nightingale; it lurks shyly in the thickest foliage, whence its pieceing notes issue, though the tipy warbler is seldom seen, and flies with singular grace. With the ancient Romans it was a highly-prized morsel, and in our own day it is one of the rarest autumnal delicacies of the Italians, the Greeks, and the French. It is especially well prepared in Venice, where, in autumn, when the flesh is most delicate, it fetches in the market four shillings at the lowest price, and often commands as high a sum is most delicate, it letches in the market lour shillings at the lowest price, and often commands as high a sum as one pound spiece. The Italians have an annual feast which they term Beccafficats. The term beccaffic applied rather indiscriminately to different kinds of the Sylviida, or Warblers, when they are fat enough to serve at table.

BECK, bek (Ang.-Sax.), denotes a brook or small atream of water issuing from some spring or rill. It enters into the composition of the names of many English places; as, Walbeck, Bournbeck, &c. The German word back has the same signification, and in like manner forms part of the names of various places;

as, Griesbach.

Bro, bed (Ang.-Sax.), an article of furniture upon which to recline for repose or sleep. In the early ages it was the practice of mankind to stretch themselves upon the skins of animals, which was the custom of the Greeks the Romans, and of the ancient Britons before the Reman invasion; after which event the skine spread for this purpose on the floor of the apartments were changed for heath and rushes; and, in the course of time, the introduction of agriculture applied the central Britons with the greater corvenience of straw beds. The beds at the inns of this period were filled with the soft down of reeds, and those of the Roman patricians with feathers. For many ages the heds of the Italians had been composed of straw; and from them it is probable our country-men learnt its application. In Wales the beds of the humbler classes were stuffed with rushes as late as it o end of the 12th century, and atraw was used in the royal chambers of England at the close of the 18th. Reds appear to have been the chief domestic glories in England during the 14th century, and were considered of sufficient importance to be named in the wills of our sovereigns and the chief nobility. Anne, countess of Pembroke, for instance, in 1367, gave to her daughter a bed, "with the furniture of her father's arms." In 1368, Lord Ferrers left to his son his "green bed with his arms thereon;" and to his daughter his "white bed, and all the furniture, with the arms of Ferrers and Ufford thereon." Edward the Black Prince bequeathed to his confessor, Sir Robert de Walsham, large bed of red camora, with his arms embroidered at each corner; while to another friend he left another bed of camora, enriched and powered with blue eagles; and, in 1385, his widow gave "to my dear son, the king, my new bed of red velvet, embroidered with ostrich feathers of silver, and heads of leopards of gold." In many parts of the country agricul-

Richardson.

particularly so when they are startled. The beaver is found in Europe as well as America, although differing

in one important respect, viz., in the building of its house. Until very recently, it was supposed that the European species did not build its habitation like the

American beaver, but burrowed along the banks of rivers. It is, however, now known that the American

beaver living near the settlements acts in precisely the

same manner as its European brethren, and, moreover, that in certain places which are secluded, the latter build their houses after the fashion of their transat-

lantic friends. At some remote period beavers are supposed to have been common in Scotland; and tradi-

tion implies that Beverley, in Yorkshire, took its name from the circumstance of beavers abounding in the neighbouring river Hull. Giraldus Cambrensis briefly alludes to the Welsh beaver in the 12th century. In-

deed, considering all the evidence, traditionary and recorded, there is little doubt that the beaver at one time was common in Britain. Even in America, where it is so abundant, such is the demaed for beaver skins, that it is very probable that the writer who may record

tural labourers now sleep on chaff beds; and in the Highlands heath is very commonly employed. In Italy and France straw beds are still in general use. The medern bed is a case or sack of ticking, filled with chaff, wool, feathers, or any other soft material, and placed upon a raised wooden or iron framework, which is called the bedstead.

BED, in Geol., the term usually applied to a stratum of considerable thickness, and of uniform homogeneous texture; as in such expressions as "bed of sandstone," bed of clay," &c. Originally, however, the term bed referred to the surface-junction of two different strata. Ban, in Mining, a term applied to an horizontal layer

of ore, stone, clay, &c., of considerable thickness.

BED, DINING (in Antiq., lectus tricliniaris or discr bitorius), a couch running round three sides of a table, for reclining upon at meals, in use among the Greeks and Romans. These dining-couches or beds were four and Romans. I ness uning-countes or beas were four or five feet high, and three of them were ordinarily placed against a square table, in such a manuer that one of the sides of the table remained open and accesssible to the waiters. Among the Romans, the usual number occupying each couch was three; so that the three couches of a triclinium afforded accommodation for a party of nine. It was the rule of Varro that the number of guests ought not to be less than that of the Graces, nor to exceed that of the Muses; sometimes, however, as many as four lay on the couch. Among the Greeks it was usual for only two persons to recline

on each couch.

BED OF JUSTICE (Fr. lit de justice) is, literally, the seat or throne occupied by the French monarch when he attended the deliberations of parliament. Historically, it denotes a solemn proceeding resorted to the wortes by the monarch, in order to carry some measure against the will of the parliament. If any royal decree was opposed by the parliament and the king insisted upon carrying it, he proceeded to hold a lit de justice, i. e. went to parliament in person, attended by the chief officers of his court, and there, mounting the throne (lit), caused the decrees to be registered in his presence; and decrees so registered were considered of greater authority than decisions of parliament. The last bed of justice was held by Louis XVI. at Versailles, Sept. 20th, 1787, at the commencement of the French revolution, in order to enforce upon parliament the adoption of certain obnoxious taxes.

BEDCHAMBER, LORDS OF THE, are officers of the royal household under the groom of the stole. are usually twelve in number, and wait a week each in turn upon the sovereign. The groom of the stole an turn upon the sovereign. The groom of the stole only attends his majesty on state occasions. There are, also, thirteen grooms of the bedchamber, who likewise wait in turn. During the reign of a queen, all these offices are held by ladies. The appointments are in the rôyal nomination, and they all have salaries attached to them. At present [1862] her Majesty has eight ladies of the bedchamber, and three extra: and with the dchamber wowen and one arter. In 1870 Size eight bedchamber women, and one extra. In 1839 Sir Robert Peel, on forming a new ministry, made the un-usual request to be permitted to change the ladies of the bedchamber, a request which he said circomstances justified. This being declined, he resigned his pre-

BEDE-HOUSE, beed house (Sax. bede, a prayer), was a name given to an hospital or almshouse, from the poor people who enjoyed the benefit of them being expected to pray for their benefactors. Hence, a bede-man was one who lived in a hede house, or was supported

by the funds appropriated for that purpose.

BEDERMAN, or BEDEMAN. (See BRADSMAN, and
BEDE-HOUSE.)

REDLAM, bed'-lam, a corruption of Bethlohem, the name of a religious house in St. George's Fields, London, which, after the dissolution of the religious houses by Henry VIII., was converted into an hospital for lunatics, but still retained its former name. In 1675 the old building was taken down, and a new one erected in Moorfields, at the cost of nearly £17,000. In 1814 this second hospital was taken down, and the patients transferred to a new and more commodious building, erected in St. George's Fields having accommodation for 193 patients; and in 1836 a new wing was added to it, capable of accommodating 186 additional patients. The whole buildings now cover, it is said, 14 acros.

BEDLAN BROGARS. — Great improvements have taken place during late years in the treatment of the insune at Bedlam or Bethlehem Hospital. Forthe insune at Bedlam or Bethiehem Hospital. som-merly a cure was seldom effected, and now more than half the inmates are sent out cured. It was also the custom in former years to exhibit the patients publicly in cages, like wild beasts. The funds of the hospital were very small, and many of the patients only partially cured were sent out with badges of tin on partially current were sent out with dadges of am on their arms, with an inscription explaining their state. These wretched beings went about seeking charity, and were called Bedlam-beggars, or Tom-o-Bedlams. Is King Lear, Edgar, as poor Tom, simulates before the blind monarch that he is a Bedlam beggar. They were put a stop to in 1675, when an order appeared in the

put a stop to in 1015, when an order appeared an one London Graette, cautioning the public not to give alms to persons pretending to be Bedlam beggars.

BEDOUINS, or BEDOWERNS, bed-oo-ins (Arab., in-habitants of the desert), a numerous Mahometar race which dwells in the desert of Arabis, Egypt, and Northern Africa. It is still doubtful whether they belong to the same race as the Arabs or differ from them in their descent, as they do in their manner of living. The Bedouins live at a distance from cities and villages, in families under sheiks, or in tribes under emirs. Their dwellings are huts, tents, ruins, and caverns. With their herds and their beasts of and caverns. With their herds and their beasts of burden, which carry what little property they possess, they wander in search of fresh water and pasture. They are good horsomen, and generally fond of hunting. The peaceful tribes exchange horses and fat cattle for arms and cloth with neighbouring nations. Other hordes are open robbers; and it is dangerous to travel through their country without a guard or a pussport, which the different objects sell. Terrible encounters have been the consequence of travellers counters have been the consequence of revenues, refueing to part with their property without resistance. Notwithstanding this, even the predatory Bedouins hold the rights of hospitality sacred; and the most defenceless enemy is sure of their protection if they have once allowed him shelter. But the Ledouin considers every one his enemy who is not his brother, kinsman, or ally. Ever careful of his own esfety, he attacks no camp or caravan without being sure of his superiority.
To a determined resistance he yields, and saves himself by speedy flight. A terror to the neighbouring nations, the rapacious Bedouin lives in a state of con-tinual watchfulness,—poor, ignorant, wild, rude, but free and proud of his liberty. He is remarkable for a temperance in food amounting almost to abstinence.

BED-STREW. (See GALIUM).
BEB, be (Ang.-Sax.).—Under this name, in England alone, are included about 250 species of insects of the ord. Hymenoptera. They are divided into two large groups,—the Andrenida and the Apida. The species of Andrenida are very extensive, and most abundant in the spring. The iemales construct their nests underground in a singular manner. Usually selecting a sandy situation, they burrow in the ground to the depth of about eight or nine inches. This hole, which the Andrenida and the Apida. The species of is cylindrical, is only of sufficient dimensions to admit the bee. The bottom, with the aid of some glutinous substance, is made tolerably smooth. This labour accomplished,—and, considering the soil is only removed a grain at a time, it is no small labour,—it sets forth in search of pollen. This the bee procures from sourch in scarch of poncer. Into the dee procures from flowers, and carries to her cell on her hind legs, which are thickly covered with long hairs. With the addition of a little honey, the pollen is made into a small paste-ball, in which the egg is deposited, and the mouth of the cell hermetically scaled. In time the care becomes a lura and devuise the audiant which egg becomes a larva, and devours the pollen in which it has been enveloped; the larva turns to a pupa, and then the next transformation produces a bec. It, however, remains in a torpid state till the next year. The Apide are a more important group; and the habits of the species belonging to it are more variable than the Andrenide. To this group belongs the bire or honey-bee, which demands particular attention. In the earliest records may be found notices of this insect. Kenophon, who lived more than 2,000 years ago, and who is famous for his remarkably clear and perspicuous with the injury his men received by eating honey of bees which had fed on deleterious plants. Both Aris-

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tothe and Virgil were observers of its habits. Pliny teils us that the philosopher Aristomachus spent fifty-eight years in investigating bee-nature; and Philisous devoted the whole of his life to this branch of study. Indeed, from the time of the earliest philosophers down to the age of the pious Dr. Watts, it has been a favourite theme. The principal modern labourers in this field of science are Swemmerdam, Résumur, Bonnet, Schirach, Thorley, Hunter, and lastly, and greater than all, the blind naturalist Francis Huber (1750 to 1831). The patient and ingenious investigations of Huber were the means of bringing some most important evidence on the nature and habits of the bee before the world, which had hitherto been involved in considerable obscurity. But the subject is far from exhausted; and although it has engaged the attention of numerous men of science since Huber's time, it is still at the present time (1832) a subject on which the rays of science, guided by the hand of some future skillul explorer, may throw considerable light. Let us, however, bet thankful to those men who have devoted their whole



lives to the investiga-tion of so humble a particle of animated nature, and take a brief and rapid survey of the result of their labours. A beehive contains three classes of inhabitants, - the workingbees, the drones, and the third order, represented by only one member, — the queen-bee. The first class is tho most important. They are believed to be undeveloped females; consequently, incapable of taking part in the reproduction of their species. The species. drones are the males, and exist but for the propagation of their kind. The queen-bee is the mother-bes of the whole colony, and lays about 200 eggs a day through the whole season, from early spring to September. The anatomy of the work-

ing-bee forms one of the most interesting portions of entomology. Its body is about half an inch in of entomology. Its body is about half an inch in length, of a blackish-brown hue, and is covered with rengen, or a placement-rown mae, and is covered with thick hairs, which serve the insect for the purpose of collecting pollen. The most singular part of the body is that which is called the proboscie. This instrument, if casually observed, appears to be a single tail, and formerly it was considered so to be by naturalists. Examined through the microscope, however, it appears a slender projection composed of some forty cartilaginous rings, fringed with fine hairs. It is formed of five parts, a central stalk, and four lateral ones,-two on The central part, used for collecting honey, is aided by the fringed hairs lapping up, like a tongue, enything to which the proboscis is applied, and then conveyed to the pharynx, or honey-bag, whence, in due time, it is disgorged into the cells of the comb. The structure of the other portions of the mouth are beautifully adapted to their several uses. The bee has three pairs of legs, the anterior ones being the shortest, and the posterior the longest. The latter have a cup-The latter have a cuplike cavity on the fore-leg, which the bee uses to con-tain the pollen it collects. The legs are all covered with hairs, and more particularly the ones which carry the pollen. There is a pair of hooks attached to each foot, which enable the bee to walk on the roof of the It was clearly demonstrated by Huber that re spiration was as essential to the boe's existence as that of any warm-blooded animal, Situated behind the wings are spiracles, or air-openings, which admit air for the purpose of oxygenating the circulating system.

That these spirucles were the instruments of respira-

tion, Hober proved by immersing a bee in water; so long as the air-openings were free, the insect fived; immediately they were placed under water, the bubbles which encaped from them proved their use, and the bee ceased to exist. The abdomen contains the honey-bag, the stomach, the wax-bag, the venom-bag, and the sting. The honey-bag, though conssionally called the first stomach, is not used for the purpose of digestion; it is a small bag, shout the size of a pea, with two pouches behind, and is properly only an enlargement of the guillet. This recentacle receives the honey from of the gullet. This receptacle receives the honey from the proboscis, as already stated. A small passage thence leads to the stomach, which receives and digests the food of the bee. It was formerly supposed that the wax of the bee was the pollen elaborated in the standard and afterwards allowed by the mouth stomach, and afterwards ejected by the mouth. The celebrated anatomist John Hunter discovered two small ponches in the lower part of the abdomen; and it was found that the wax is derived from the eaccharing matter consumed by the bee, and that it is accreted from vessels on the surface of these pouches. After the from vessels on the surface of these potentials wax has remained there for a time, it appears externally in scales, usually eight in number, below the medial rings of the abdomen, and is removed by the beet itself or one of its fellows. One of the most important and beautifully developed organs is the sting, which hes close to the abdomen. Viewed through the micrones close to the abdomen. Viewed arrough the merce scope, it presents one of the most elaborate and exquisitely defined pieces of mechanism to be found in the wondrous workshop of Nature. It consists of two long darts, adhering longitudinally, and protected and encased by one sheath. The fineness of this apparatus may be shown by the fact that the sheath itself, which is not nearly so sharp as the durts, placed under a is not nearly so sharp as the darts, placed under a magnifying lens exagerating its proportious some two hundred fold, is, towards the point, quite invisible. We have a subject to the sheath is first protracted and inserted; then the two fine darts follow, and are also inserted. The puncture being made, the poison is conducted in a groove to the end of the sheath. And now the most singular part of the basis of the contraction of the sheath. ness follows. The long darts are armed with nine or ten barbs at the end, and this prevents them from being too quickly withdrawn. Immediately the poison flows in, the darts are withdrawn, and the deadly liquid has a cavity to enter, which soon festers, and produces death. The nature of the poison is not known; it possesses, however, a certain acidity, which will redden regetable blues. With regard to the other senses of the bee, the evidence is far from satisfactory. It has five eyes in all,—three on the top of the head, and two in front. Springing from between the latter are two tubes, curving outwards on each side: these are called the antenna, and serve the insect for the ordinary purposes of vision. The antenna are extremely sensitive, and, indeed, the most useful organs of the bee. By their aid it builds its cells, feeds the young, and stores the hive. They are also used as a medium of recognition with its kind. The combs of a bechive comprise a congeries of hexagonal cells, built by the bers as a receptacle for honey and for the nur-series of their young. Each comb in a hive is com-posed of two ranges of cells backed against each other: the base, or partition, between the double row is so disposed as to form a pyramidal cavity at the bottom of each. There is a continued series of these double combs in every well-filled hive, the spaces between them being just sufficient to allow two bees, one on the them being just sufficient to allow two bees, one on the surface of each comb, to pass without touching. Kach cell is hexagonal, the six sides being perfectly equal. This figure insures the greatest possible economy of material and space. The outer edges of the cells are slightly thickened, in order to gain strength. The same part is also covered with a beautiful varnish, which is supposed to give additional strength. Tho construction of several combs is generally going on st the same time. No sooner is the foundation of one laid, with a few rows of cells attached to it, than a second and a third are founded on each side, parallel second and a third are founded on each side, parallel with the first; and so on, till the hive is filled, the combs which were commonced first being always in the most attranced state, and, therefore, the first com-pleted. The design of every comb is sketched out, and the first radiments laid, by a single bee. This foundress bee forms a block out of a rough mass of war,

## Beehive

own woods. The qualified property which may be thus held in bees continues while the swarm remains on the held in bees continues while the swarm remains on the soil, and, in the event of flight, so long as the namer can pursue it. Indeed, so clearly are they considered, in law, of the nature of property, that it has been decided in England that bees may be the subject of lureeny. According to Scotch law, as propounded by Mr. Erskine, bees who abandon their hive without being observed and followed, are understood to have recovered their original liberty: any one, in such a case, may hive and claim them. In the illustration upon the preceding name are furned. the preceding page are figured:—I. the queen-bee; II. the drone; III. the working-bee. For details of management, see Brentye and Keeping of Bres.).

Brech. (See Facus.)

BEE-EATKE, be-e'-ter (Merops apiaster). - These birds are found in large numbers in the southern and eastern provinces of Europe and the northern districts of Africa. They build their nests in clay and sand of Africa. Th

sociate 60 closely together, that the earth appears like a honey-There comb. is some analogy between these birds and the swallows; indeed, in the neighbourhood of the Cape, where they most abound they are called by the Dutch mountain swal-



BEE-EATER.

house in certain parts of Africa they are much respected by the natives, who have a belief, that by following one of them, the discovery of a store of honey will be the certain result. They are larger than the common swallow, and have a long and slightly-curred beak. Their colour is a blending of white, and brown, and green.

BERF. (Sec FOOD, ANIMAL.)

BERF-RATER, a gen. of birds only found in Africa. This bird belongs to the ord. Insessores, tribe Coniros-They have short bills, swelling towards the point, and square at the base. They subsist upon the larves of gadflies, which they find in the hides of buffaloes, of gadilies, which they find in the mores of buliances, camels, and other large quadrupeds. They perch upon the backs of these animals, and Dr. Livingstone states, with regard to one of the species,—the buffulo-bird, that as their sight is keener than that of the buffulo, they see the approach of danger first. When the buffalo perceives that the birds are flying away, he is warned that he is in peril, and begins to look around

warned that he is in peril, and begins to look around him. The beef-eaters are sometimes called ox-peckers. BEEF-RATERS, beef-e-ter, a name popularly given to the yeomen of the guard. Differences of opinion exist as to the origin of this term; but it is generally derived from the French beffetier, from their waiting at the round table. at the royal table on great occasions. They were first constituted by Henry VII. in 1485, and have continued as a royal institution, and with nearly the same costume,

to the present day.

Brer Tra, beef-te', a light soup or broth made from ox-flesh. In all preparations of soup, the raw meat should be put into cold water, which should be very gradually brought to the boiling point. By this means the juices of the flesh are extracted from the first moment, and, with these, lactic and phosphoric acids, two of the principal components of the gastric juice. The best method of preparing beef tea is to take finelychopped raw beef, as lean as possible, and allow it to soak for ten minutes or more in its own weight of cold water; then heat it gradually to boiling. After boiling

drawn partiy from its own resources, but principally from those of other bees, which farnish war from small sace, in which it has been secreted, that are situated sacs, in which it has been secretical, that are strated between the segments of the body of the bee, taking out the plates of wax with their hind-feet and conveying it with their fore-feet to their mouths, where it is moistened, and rendered soft and duotile. The mass of wax prepared by the assistants is applied by the foundress bee to the roof or bottom of the hive, and thus a slightly double convex mass is formed. When of sufficient size, a cell is sculptured on one side of it of sunctions size, a cell is somptured on one size of it by the bees, who relieve one another in the labour. The sells intended for the drones are considerably larger, and more substantial, than those of the workers, and being formed subsequently, they usually appear nearer the bottom of the comb. Last of all appear nearer ane contom of the confidence in the form are built the royal cells for the queens; these are situated in the very centre of the hive, and number from three to twelve. When the cells are ready, the queen begins to lay her eggs. The fecundation of the queen-bee is very extraordinary. It has been pretty clearly ascertained that no connection takes place with the drones in the hire. The question naturally arises, why this large number of drones in a hive? Huber's investigations have to a certain extent cleared away the mystery. According to this eminent naturalist, fecundation takes place by contact in the air; and it is consequently essential that the number of drones should be large, that the queen-bee may be sure of meeting them when going abroad. One intercourse is suffi-cient to render the queen-bee fruitful for two seasons. It is estimated that she gives birth to 100,000 bees in a single season. The eggs which are to produce working-bees are laid first. These are carefully watched; and, when they are hatched, the larva is fed with mixed honey, pollen, and water, by what are called murse-less, whose whole work is to nurse the young bees. Not until eleven months have elapsed in laying ing-eggs, does the mother-bee commence laying the male and royal eggs. The nursing of the latter is managed on a grand scale. The royal larva disdains simple honey or pollen; it must have rich jelly, and in such quantities that her highness's cell is saturated with it. This waste is rather contradictory of the bee's frugality; but bees are wonderfully loyal creatures. From the egg to her majesty bee, the whole time occupied in the metamorphosis is about sixteen days. Now the bees only require one queen at a time; indeed, most monarchical institutions would find it extremely inconvenient to have more. So these newly-batched majestics must be kept confined until the throne is vacant. There is also another important reason why they are not set at large. When two queen-bees meet, it is certain death to one. At the same time they cannot manage without a queen; and each time a swarm take their de parture, a queen is always at their head. There are generally too many royal bees; hence, when they are brought together, a fight cosues, and the number is diminished. Ferhaps the most singular phenomenon in bee history is the making of a queen. On extraordinary occasions, when the hive by some accident is depriced of a queen, and destitute of royal larva, a wonderful provision is resorted to. One of the working larver is selected, deposited in a royal cell, fed on the same food which is administered to the royal larva, and it ultimately be-comes a queen. The only explanation that can be given is, that the peculiar food provided has the effect given is, that the jecture it too provide has the enter of rendering the honoured insect fertile. Towards the beginning of August, a good stock of eggs having been laid, the drones are no longer required; and winter, long and dreary, is before the industrious bees. What must be done with the lazy ones? They are massacred by the workers. A buzzing commences in the hive; the heavy drones and the nimble workers grapple and hug: but the strength of the lazy drones avails them nothing; the sharp stings of the workers pierce them reching; the sharp stings of the workers pierce them through, and presently the ground is heaped with the sola for ten minutes or more in its own weight of cold water; then heat it gradually to boiling. After boiling nesects are, according to Blackstone, wild by nature; but, when hired and properly reclaimed, are regarded in the nature of property, belonging to the person on whose ground or soil they have swarmed. In support both shortine, Blackstone erefers to the Charter of this doctrine, Blackstone erefers to the Charter of the Forest, 9 Henry III. c. 13, which allows every freeman to be entitled to the honey found within his term applied to the habitation of bocs. They are 213

#### Boshive-House

usually made of straw or wood. The former substance is most common, as the honey is liable to mak in wooden hives during hot weather. Glass hives, or hives with glass doors or windows, so as to observe the motions of the bees, are now much used, and in Greece and Turkey the hives are principally made of earthenwere. The shape of a beehive is not of much earthenware. The shape of a beehive is not of much consequence, but it is considered of importance to have the hive so constructed as to be enlarged above or below at pleasure. Beehives should always be situated in the neighbourhood of flowers. Honey made from heather-flowers is much esteemed in Scotland; and when the season of the heather-bloom comes on, a large number of hives are removed to the moors and s. In Egypt hives are removed from place to place on the Nile in barges, in order to reach the places where particular flowers are in season. Bechives are usually about eighteen inches above the ground, and are generally protected with a shed or straw hood, to protect the bees from the rain.

BERRIVE-HOUSE, a term employed to distinguish small, round, stone buts which are found in Ireland. They are very rudely built, and are supposed to be the relies of the most ancient architecture of the island. The doors have flat tops, and are wider down below than above, as in the buildings of Egypt. When a beehive-house is found alone, it is mostly near the site of an ancient oratory. This favours the notion that they were the dwellings of the priests. When two or three beehive-houses are clustered together, they are usually connected by a passage, and are often under-ground, resembling the Picts' houses or earth buts found on the north-east coast of Britain. Ruins of beehive-houses exist in the western islands of Scotland.

BEEMASTER, one who keeps bees. (See KEEPING OF BRES.)

BERR. (See ALE, BREWING, PORTER.)

BERR. (NEGALE, DREWING, COLLEGE,)
BERRACTS. (See Alemouses.)
BERRACTS. (See Alemouse.—In the year 1800, the
BERRACTS to the English military authorities
to add one penny per day to the pay of the British
troops while on home service, in lieu of the heer and spirits which had formerly been issued. This allowance received the name of "beer-money;" and to this day it figures as a distinct item in the military accounts.

BRESHA, be'-sha, in Bot., a gen. of grasses nearly allied to the Bamboo, but differing from it in having the seed inclosed in a fleshy pericarp. Two species are known, both natives of the East Indies.

BEESWAX, bees' max. — This substance has been investigated by numerous chemists. It appears, from the researches of Brodie, that wax is a true animal secretion; for bees fed on sugar only, continue to desecretion; for bees ted on sugar only, continue to de-posit it in large quantities. At ordinary temperatures, beeswax is a tough solid yellow substance, having a specific gravity of 0.96, and fusing at about 145°. When exposed to the air in thin slices, it becomes bleached; but nitric acid is generally employed for this purpose. Chlorine cannot be used for this purpose, as it is climinated in suffocating fumes of bydrochloric acid when the wax is burned. Wax consists chemically of rayricine, insoluble in boiling alcohol; cerine, a crystalline substance dissolved by boiling alcohol; and cere-leine, which is dissolved in cold alcohol. Wax is imported in large quantities from Germany, Russia, Portugal Zanzibar, East and West Indies, and North America. The wax from these countries bleaches readily; while that from Gambia, Cuba, and the Gaboon, seldom reaches a good colour; notwithstanding which, the major portion of wax imported into England comes from the first-named locality. The process for bleaching wax is simple but tedious. The wax is cut in The process for pieces, meited, and agitated with a small portion of very dilute sulphuric soid, which facilitates the separation of impurities. When perfectly clean and bright, it is sliced by a cutting-machine into very thin shocts, and exposed to light and air for eight or ten weeks, during which time it is remelted once or twice. (See CANDLES, VEGRTABLE WAX.)

# Beggar

pearance. It is a dipterous or two-winged insect, and pearance. It is a dipterous or two-wingen inserts and belongs to a genus whose larvar inlest and feed upon the roots of cabbages, turnips, &c. (See Carrage Bly, Turnips-Fly, Potato-Fly.)
Bertin, bed-tl.—This term is frequently used to designate the large tribe of inserts called Scarnobisides,

but it is more frequently and correctly used as the name of those insee. which are covered with a strong horny substance, and have the abdominal part of the body guarded by two sheaths, under which the wings are folded. Hence the word is often used in works on natural history as the ordinary designation for colcopterous insects. This, however, is not correct, as it would bring under the title of Beetle, cantharides, weevils, fire-flies, &c. (See the articles Coleoptera, Scarabæides, Stag-Beetle, Tiger-Beetle, Bom-Bardier-Beetle, Burving-Beetle, Goliath-Bee-

TLE, ROSE-BEETLE, &c.

BEETLE-STONES.—In a cliff composed of shale, at
Newhaven, as well as upon the beach in the vicinity, there are found certain indurated nodules of clay iron-These minerals are selected by the lapidaries of Edinburgh to be fashioned into articles of ornament; as, letter-weights, &c. When highly polished, these stones present a very attractive appearance. The term is said to have owed its origin to a fancied resemblance of the nodules to a fossil beetle. Although some of these minerals exhibit proofs of an animal origin,—a fossil fish, for instance, the nucleus of the nodules is never that of a fossil beetle.

BEETLING, a process applied to cotton shirting, in which the yarn is so treated as to give the cloth a hard appearance, in imitation of linen. a hard appearance, in imitation of linen. It was first employed upon linen shirting. A number of wooden empayed upon men surring. A number of wooden stampers, placed in a row, strike upon the cloth as it passes under them, producing the effect required. The engravings given at figs. 1, 2, and 3, on the next and fol-lowing pages, represent an improved form of machine for the production of ornamental or other figured fabrics by pressure from corrugated or indented surface-rollers of various patterns. The improvement consists in the peculiar construction and arrangement of suitable machinery for giving to woven fabrics a glossy fluish similar to that which is now produced by the ordinary stamps in the machines called beetles. This invention This invention also relates to improvements in arranging or applying steam or fluids to such purposes, thereby giving a certain pressure to the rollers employed in the improved beetle, as also for a combination of mechanical arrangements necessary for the construction of a rollermangle, with sufficient to produce the operation of beetling. The engravings on the next page represent a front elevation and an end elevation of this machine, with the same letters of reference applying to similar parts. A A are cast-iron stand and frames, having side-claw projecting hearings, B B, with two central horn-shaped ones, A carrying the pressure-lever links; C C are bush-bearings for the journals of the beetling rollers D and E, which rotate horizontally with each other in opposite directions; FF is the roller upon which the cotton fabrics about to undergo the beetling process are wound; GG is the pressure-roller mounted in the lever-link motion-head HH, upon the central horn-standard j, in a manner subsequently explained; I is the shaft upon which the pressure-roller revolves; K K, two connecting-rods on each side of the machine, attached in vertical positions at the top to the links H H, and at their lower ends to the weighted levers L L; M is the centre stud upon which the levers L L radiate; N N are two spherical-shaped halls or weights for giving pressure to the roller G, through the medium of the levers L L, assisted by their own gravity. O is the horizon or which the comments. gravity; O is the bearing on which the connecting-rods K K move; P is an intermediate crank motion-rod coupling the two way link-shafts V R, and giving motion horizontally to the horizontal rest-bars T T through the quarter-way links 5 S, in year with the same; U U are two sour-wheels mounted upon the beetling roller-shafts D and E, in gear with a pinion V, on the driving-shaft; WX is a long hand-lever, the CANDLES, VEGETABLE WAX.)

BERT. (See Beta.)

Bert. (Authornia Beta), an insect not so object of which is to raise the different roners from their beds by it in the manner hereafter explained. leaves of beetroot or mangel-worzel. When the Having thus far described the various arrangements harm leave the eggs, they devour the soft parts of the same parts of which this invention consists, it is necessary to explain its mode of working, and the numerous 244

# Beetling

advantages that may result from its application to the various purposes for which it is intended. Steam or other motive power is in the usual manner first applied to the driving-shaft W, which is mounted in a bracket bearing against the standard-draming, as represented in the engraving; whilst the other end is similarly mounted against a wall or other convenient place, and when driven by the action of steam, it causes the

## Beetling

rollers, it is then passed between the beefling-rollers D and E, which are furnished with peripheries such as are seen in the two engravings on the next pages; these are embossed or checkered in different patterns, corresponding to the rollers employed. The Isbrius are then taken from the rollers, and replaced by others during the working of the machine, and the operations effected. The pressure to which the fabrics are ex-



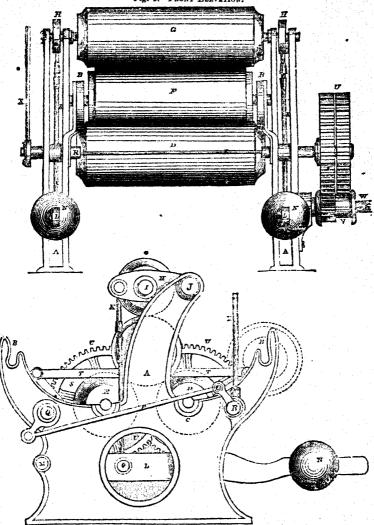


Fig. 2 .- END ELEVATION.

pinion V, on the end which takes into the spur-wheels U U, to propel the same, and thereby give the required motion to the machine or apparatus during the process of beetling. It must be observed that the cotton fabrics about to be mangled or beetled are first wound upon the roller F; to accomplish which, the roller has to be removed or taken out of its place, which is performed in the manner hersafter explained. Having completed the operation of winding the cotton on the

posed by the constant rotation of the rollers between which they pass, is produced and carried into effect as follows:—The roller GG, with its morable link-bearings on each side centred on the horn-shaped standards, are caused, through the medium of the side connecting rods K K, to receive the cutire weight of the levers L L, in addition to the weights H H on the ends, and consequently offer a sustaining pressure to the fabrics during the process of beetling. On the other hand,

when it becomes necessary to supply the apparatus with plain ootton fabrics, and remove those already bestled, the levers L L, which are represented as having holes at one end for the employment of any shitable or convenient tackle, are to be by such means raised, the action of which will have the effect of raising also the head-links and pressure-roller, and thus, by removing the weights, enable the roller bethus, by removing the weights, enable the roller be-neath to be lifted out of its scat and placed in one of the

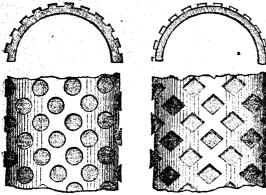


Fig. 3.-BLETLING-MACHINE.

end claw-bearings (BB), as represented by the dotted ders employed in the process of beetling or otherwise. The mode of effecting this part of the operation (See Calendral), will be readily comprehended by reference to fig. 2, BERTROOT SUGAR. (See SUGAR.) where TT shows a bar of iron horizontally placed on each side, beneath the journals of the roller F, forming a rail or table upon which they are to be moved. When a downward motion of the lever handle is given by the operator, it causes the coupling-rod P, through the medium-links P R, in connection with others on the same shaft, in gear with the rest-bar TT, to move upwards horizontally, similar to the action of a parallel rule, and raise the rollers F or B out of, or into, their respective places, by enabling the rollers to be rolled along them when disengaged from their bearings or seats, and carefully lowered into their places, in readiness for the next operation. From these observations it will be seen that, first, the levers L L are to be raised in the manner which will cause the roller GG to be also raised through the medium of the connecting rods K K, when the pressure will be removed from the lower rollers, and which will enable them to be raised to the required height, so as to transfer them from one seat or bearing to another, and thus allow the fabrics to be changed by removing those already having undergone the process, and supplying the other roller with plain ones. The patentee, although he de-scribes and sets forth the employment of the side levers, yet does not confine himself exclusively, as other and equally effectual means may be applied with the same advantages, - such as steam pressure, liquids, or otherwise; and in many cases the weight of the rollers themselves might be found sufficient to give the required pressure, without other intervention. required pressure, without other intervention. The next object to which the patentee directs attention, is to the improved mode of constructing roller-mangles, which consists of very nearly the same arrangement of rollers, the only apparent difference being the introduction of a flexible lever or spring, firmly fixed to the standard upon which the pressure-roller is mounted, being brought to act upon the same to any degree of force by the application of a handwheel and screw-spindle supported in bearings suitably stranged. To the end of the screw-spindle two fixed studs are attached, between which the lower end of the flexible lever or spring is introduced, so that when the spindle is screwed to or from the centre of such the spindle is screwed to or from the centre of such standard carrying the roller, the pressure is applied, by reason of the standard moving from a centre with the roller under an elastic pressure, thus given by the forward or backward application of the screw hand-

The patentee states that cast-iron rollers may be employed for dry articles; but for damp ones, bell-metal would be found better adapted. One of the advantages derived from this system of man-gling, is the small space the machine occupies, together with the accommodation which it offers by being placed within a piece of furniture having drawers for the purpose of disposing of the various articles when so mangled. That which the patentee claims as

new in this invention are,-first, employment of rollers having indented, grooved, checkered, or undulated surfaces or peripheries, for producing by pressure corresponding marks or impressions therewith upon cotton or other fabrics; secondly, for the general arrangement of parts constitution the sction and construction of the said improved machinery; thirdly, for the employment of water or other fluids within the aforesaid rollers, to act independently of other pressure apparatus, such as the long levers shown at L L figs. 2 and 3; also for the application of steam to such purposes, causing, in the usual manner, by its expansion within a cylinder, a pressure to be exerted upon the rollers, and at the same time that such application should be available for the purpose of taking off and removing the pressure when required,—the same means employed for the one being found effectual in performing the other; fourthly and lastly, for the use of the numerous patterns as applied to cylin-

BEFANA, or BEFFANA, he-ful-nd, a corruption of Epiphania (Epiphany), is the name of a custom which prevails in Fiorence and other parts of Italy on Twelfthnight. Befana is said to have been an old woman, who, when the wise men of the East passed by, was busy in cleaning her house, and excused herself from going out to see them, on the ground that she would see them on their return. They, however, went home another way, and she is said to be still on the outlook for them. She is carried in effigy through the streets, amid great shoutings and rejoicings. It is generally supposed to be a remnant of some Middle-Age mystery ceremony. The

word is also used as a bugbear to frighten children. Beperal, or Penery, bef"-freum, a movable tower used in ancient and Medieval sieges. It was as high as the walls of the fortress to be besieged, and was composed of various stages, the highest one being provided with a drawbridge, which could be let down upon the ramparts of the place attacked. Similar towers, but lower in height, were used for covering the approach of troops. They all moved on wheels, the approach of troops. They all moved on wheels, and were either pushed forward or drawn with ropes. They were used by Julius Cresar in Gaul; and at the siege of Jerusalem the Crusaders made a beffroi, put it togother at a short distance from the walls, and then at together at a short distance from the wans, and then pushed it up to the ramparts. A beffroi was also made by the royalists in the time of Charles I., when attacking a fortress held by the roundheads. It was, however, captured, before the king's party could make use of it. In more ancient times, these morable towers were often covered with raw hides, to protect the industrial form the library of the content of the form of the content the inclosed soldiers from the boiling oil, &c.

were often provided with a battering-ram.

BEG, or BEY, bai, is a Turkish title, literally signifying lord or chief, and is applied generally to governors of smaller districts, higher military officers, and other persons of rank.

BEGGAR, bey'-gar, is one who solicits charity. There BEGGAR, beg'-qūr, is one who solicits charity. There must necessarily exist in every country certain persons who have not the means, ability, or, perhaps, the will, to earn a licelihood for themselves, and who are thus dependent for subsistence upon the charity of others. These constitute the poor: when they have to solicit charity, they are beggars. In the Levitical law, Moses made abundant provision for the poor; but he does not appear to say anything with respect to beggars. The first express mention of them occurs

### Beggar

in Psalm cir. 10, and from that time they are frequently mentioned in Scripture. During the time of Christ, mendicants were found sitting in the streets, at the doors of the rich and at the gates of the Temple; but there do not appear to have existed at that time vagrant beggars, or those who solicit alms from door to door. During the early and middle ages of our era, mendicity prevailed to a great extent and several re-ligious orders aprang up who derived their subsistence in this way. There is much in the life of a beggar that renders it to many persons preferable to one of labour; and hence it is necessary for the state to limit or sup-press it. In England, the earliest statute of that kind was made in the 23rd year of Edward III. (1349), and was made in the 20rd year of Edward III. (1989), and it enacted, "That, because many valiant beggars, as long as they may live of begging, do refuse to labour, giving themselves to ideness and vice, and sometimes to theft and other abomination, none, upon pain of imprisonment, shall, under the colour of pity or alms, give anything to such as may labour, or presume to invour them in their sloth; so that thereby they may be compelled to labour for their necessary living." In 1376, complaints are made by the Commons that servants and labourers quitted service on the slightest vants and tabourers quitted service on the signtest cause, and then led an idle life in towns or wandered in parties about the country, "many becoming beg-gars, others staff-strikers, but the greater number taking to robbing;" and by 12 Rich. II. c. 3, it was enacted, "That no servant or labourer, be he man or weman, shall depart, at the end of his term, out of the hundred, rupe, or wapentake where he is dwelling, to serve or dwell elsewhere," without special license; "and if any servant or labourer he found in any city or borough, or elsewhere, wandering without such letter, he shall be taken and put in the stocks, and kept until he hath found surety to return to his service, orto serve and labour in the town from whence he came." The same statute declares that every person that goeth begging, and is able to serve or labour, it shall be done of him as of him that departeth out " of the hundred or other place without letter testimonial, as afore is said;" and "that beggars, impotent to serve, shall abide in the cities and towns where they be dwelling at the time of the proclamation of this statute; and if the people of the cities and towns will not or may not suffice to find them, that then the said beggars shall draw them to other towns within the hundred, rape, or wapentake, or to the towns where they were born, within forty days after the proclama-tion made, and there shall continually abide during their ives." The statute 27 Henry VIII. c. 12, after stating that "vagabonds and beggars have of long time increased, and daily do increase, in great and ex-cessive numbers," enacts that justices of the peace and other officers shall, within the limits of their authority, grant letters to aged, poor, or impotent persons, au-thorizing them to beg within a certain prescribed limit; and if any one be found begging beyond his limit, or without such letter of authority, he shall be set in the stocks or whipped. Able-bodied persons, found begging or vagrant, to be taken to the next market-town, or other place most convenient, and there tied to the end of a cert and heaten with whips throughout the same till the body be bloody; and, after such punishment, "he shall be enjoined, upon his oath, to return forthwith the next straight way to the place where he was born, or where he last dwelled the space of three years, and there put him self to labour like as a true man oweth to do." Five sent to moour me as a crue man owen to do. Trive years later another act was passed, providing that mayors, bailiffs, and other head officers of cities, towns, and parishes, shall most charitably receive and provide for such poor persons or sturdy vagabonds as shall come into their districts, and shall receive a claims and hear the said poor people has succour, relieve, and keep the said poor people by way of voluntary charitable alms in such wise as none of them shall of necessity be compelled to wander and go openly in begging; and also shall cause the said sturdy ragation and valuant beggars to be set and kept to continual labour in such wise as they may get their own living with the continual labour of their own

# Beggar

ing in idleness to be indicted and tried at the next quarter sessions; and, if found guilty, shall be ad-judged to suffer death as a felon. It further provides, judged to suffer desta as a reson. It is that the thirdren above five and under fourteen years of age were to be taught some craft by which they might not their livings when they came of age. Notwithget their livings when they came of age. Notwith-standing these severe enactments, the number of idls beggars and vagabonds seems to have increased; and 1 & 2 Edw. VI. c. 3, after repealing all previous enact-ments, declares that every loitering and idle wanderer-who shall refuse to apply himself to honest labour is to be taken as a vagabond; and if he continue idle, and refuse to labour, or run away from work set him to perform, he is to be brauded with the letter V, and be adjudged a slave for two years to any person who shall demand him, to be fed on bread and water and refuse meat, and caused to work in such labour, how vile however it be, as he shall be put to, by beating, chaining, or otherwise. If he run away within the two years, he is to be branded in the check with the letter B, and adjudged a slave for life; and if he run away. again, he is to suffer death as a felon. sions were made by this statute for impotent beggers and children, similar to those under 27 Henry VIII. The number of vagrants, however, seems still to have increased; and Strype relates, that letters having been issued by the privy council to the sheriffs of the different counties to search for and apprehend "all vagabonds and sturdy beggars commonly called rogues or Egyptians," 13,000 "masterless men" were taken up. In 1566 a book was published, entitled "A Cavest, or Warning for Common Cursetors, vulgarly called Vagabonds," by Thomas Harnan (reprinted 1814), which gives a curious and graphic account of the hordes of idle vagabonds who then infested the country. He classes the male vagabonds under fifteen separate decassive the male vagatoria under filtern separate designations; the female under nine. In the forther case he begins with the "Ruflar," as being "the worthiest of this nevuly rabhlement." "The Upright Man" is the "second in sect of these rainging rabblement of rascals." The third is "the Hooker or Angler," ment of rasculs." The third is "the Hocker or Angler," described as a "perilous and most wicked knave." described as a "perious and most waster anave.

The fourth is a rogue, "neither so stout or hardy as
the upright man." The fifth, a "Wild Rogue," is
"more subtile and more given by nature to all kinds of
knavery than the other." 6."A Prigger of Prauncers," knavery than the other. O. A Frigger of Francers, or Horse-stealer; 7. the Palliards or Clapper-dogens; 8. Fraters; 9. Abraham-men; 10. Fresh water Mariners, whose "ships were drowned in the great plain of Salisbury;" 11. Counterfeit Kranks, who counterfeit the falling sickness; 12. Dommerars; 13. Drunken Tinkers; 14. Swadders, or Pedlars; 15. Jarke-men and Patricios. All of them, both men and women, are described as thieves by profession, and as living most dissolute and licentious lives. They have a sing language of their own, of which the writer gives a specimen in a dialogue between two of them; and he further gives a long list of the most notorious and wicked street-walkers "that are living now at this present, with their true names, as they be called and known by." During the reign of Elizabeth various attempts were made to ameliorate the condition of the poor and suppress vagrancy; and various statutes were passed on the subject. In some of these the notion of a parochial fund for the relief of the poor, and the principle of taxing the parishioners for that purpose, are distinctly recognized. It was seen, that in order to justify severity against vagrancy and mendicity, it was necessary to provide the means of re-lieving that destitution which was the ready and plausible excuse for both, as well as to provide labour for able and sturdy beggars, and to compel them to work. Hence it was enacted, that in every city, town, or other place that may be appointed, a competent stock of wool, hemp, flax, iron, or other stuff, be pro-vided by taxation of the inhabitants, and given out to be wrought by the poor; and that houses of correction be established. The statute 39 Elizabeth, c. 3, provides for the appointment of overseers of the poor in continual labour in such wise as they may get their each parish, who are empowered to raise, weekly or own living with the continual labour of their own hands. For absenting themselves from such labour, they were not only to be again whipped, but to have sum and sums of money as they aball think ft, a continual they were not only to be again whipped, but to have sum and sums of money as they aball think ft, a continual they were not only to be again whipped, but to have sum and sums of money as they aball think ft, a continual they were not only to be again whipped, but to have sum and sums of money as they aball think ft, a continual they were not only to be again whipped, but to have sum and sums of money as they aball think ft, a continual they were not only to be a sum and sums of money as they aball think ft, a continual labour in such was a sum of the said parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, weekly or cache parish, who are empowered to raise, and the parish and

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## Beggar my Neighbour

Rehmenites

and also competent sums of money for and towards and also competent sums of money for and towards the necessary relief of the lame, impotent, old, blind, and such other among them being poor and not able to work; and also for the putting out of such children to be apprentices, &c. This act was followed by the 43 Elizabeth; c. 2; which is the foundation and text-book of English poor-law, and under the provisions of which all relief of the poor in England and Wales has been entiministered for more than two centuries and a bulf.

all relief of the poor in England and Wales has been administered for more than two centuries and a half. (For an account of this and the subsequent statutes bearing upon the provisions for the poor, see Poon Law.)—Ref. Nicholl's History of the English Poor Law; Blackstone's Commentaries, by Kerr.

BEGGAB MY NEIGHBOUR.—A simple and easy game at cards. The whole pack is dealt out to two players, and the cards are held with the backs upward; each player then turns up a single card in turn. When you play an ace, your adversary must give you four cards; three for a king, two for a queen, and one for a knave; and when the requisite number are laid down, you win three for a king, two for a queen, and one for a knave; and when the requisite number are laid down, you win the trick, and place the cards so won at the bottom of those in your hand. If, however, your opponent turns up an honour while paying for that which you have previously paid, you must pay for it in a similar maner, according to its value, and so on until a complete payment is made on either side. The player who first exhausts his adversary's hand, and gets all the cards into his own, is said to beggar his neighbour.

BECHARDS, beg'-hards, in Eccl. Hist., was a name applied to a certain class of half-monks who followed

applied to a certain class of half-monks who followed the third rule of St. Francis. By some the name is derived from St. Beggs, by others from the old German verb beggen (now begehren), to beg, and hardt or hart, hard, with importunity. They arose in Germany in hard, with importunity. They arose in Germany in the beginning of the 13th century, whence they spread into the Netherlands, France, and Italy, where they were known as Bizochi and Bocasoti. As they belonged to no monastic order, they were regarded as laymen; and, from their irregular mode of life, they were looked upon with disfavour, and subjected to persecution. It formed a kind of refuge for heretics and persons of loose character, so that it came to comprise a number of sects or bodies who differed widely from each other in their opinions, discipline, and mode of life,—some given to prayer, others to prolitage. At length the Beghards were compelled to disperse, or to join the orders of the Dominicans or Franciscans. In the Netherlands, where they preserved a better character,

they continued to subsist longer; but there they dis-spiesred about the end of the lath century.

BrGLERBEG, bai-ler-bai, is a Turkish title, literally signifying prince of princes, or lord of lords, and is applied to the governors-general of provinces who are next in rank to the vizier, and have under them several begs, agas, &c. In particular, the governors of Rou-

neita, Anatolia, and Syria, have this title.

BEGONIA, be-go'-ni-d (so named after Michel Bégon, a French botanist), in Bot., the typical gen. of the nat. ord. Begoniaceæ. The species are natives of tropical regions, but many are now cultivated as ornamental plants throughout Europe. The leaves are oblique or unequal (more developed on one side of the nuidrib thus, or the other), and are offen right throad with than on the other), and are often richly tinged with crimson. The flowers are of a delicate pink colour, and grow in cymes. The young stems and leaves of the species B. malabarica and tuberosa are used as potherbs in the countries where they grow wild. Of the numerous species which adorn our conservatories, B. argyrostigma and discolor are perhaps the most beautiful. The first of these, the siter-spotted begonia, was brought to this country from Brazil in the early part of the present century; the leaves, which are long and pointed, are red beneath and spotted with white above. B. discolor, or two-coloured begonia, is a Chinese species, and is remarkable for the very rich crimson of

species, and is remarkable for the very rich crimson of the under-surface of the leaf, which is short and broad.

BEGONIACEE, be-go-ni-ni-se-e, in Bot., the Begonia fam, a nat. ord. of dicotyledonous plants in the subclass Monochlamydee, consisting of four genera and 100 species, natives chiefly of India, South America, and the West Indies. The species are herbs or low succuleut shrubs, with alternate leaves which are oblique at the base and have large dry stipules. The flowers, which grow in cymes, are unisexual, the perianth coloured, with four unequal divisions in the male flower,

and five or eight in the female. The stamens are numerous; the fruit is membranous, winged, three-celled, bursting by slits at the base; the seeds are very small. The plants are more remarkable for their handsome leaves and neat flowers than for useful properties.

They are reputed, generally, to possess astringent and bitter qualities, and occasionally to be purgatire. Brevins, beg-u-ins, in Eccl. Hist, were s class of women who, without taking any vows or following the rules of any order, united themselves together for devictional or charitable purposes. They appeared in Germany and the Netherlands as early as the 11th century, and we said to hear taken their name from St. Bergard. and are said to have taken their name from St. Begg They lived generally in small separate cottages, under the direction of a superior, and were distinguished from the rest of the laity only by their industry, piety, and secluded habits, and their great attention to the education of the young. They continued to exist in Germany to the time of the Reformation, and in the Netherlands down to the close of the 18th century. There are still to be met with in some parts of Holland, Belgium, and Germany, what are called Beguinen-hänser; but these are little more than almshouses for poor spinsters. The most famous is at Ghent, which is said to comprise 600 inmates, who devote themselves to attendance on the sick and the education of young

BEHEADING. (See DECAPITATION.)
BEHEMOTH, be'-he-moth, an animal of great strength, described in Job zl. 15—24, and nowhere else mentioned in Scripture. Commentators are very much, divided as to what animal is meant. By some it is understood to be the elephant, by others the hippopotamus; the general opinion seems to be in favour of the latter

BEHMENITES, be(r)'-me-nifes, a religious sect which flourished in Germany and other parts of Europe in the 17th century. They took their name from Jacob Behmen, Boehme, or Boehm, a celebrated German Hebmen, Bochme, or Bochm, a celebrated German mystic or theosophist, born near Göritz, in Upper Lusatia, 1575. His parents being poor, he received but little education, and learned the trade of a shoe-maker. Naturally of a serious turn of mind, he was given to studying the Holy Scriptures; and that passage seems deeply to have fixed itself upon his mind,—"My Father in heaven will give his spirit to them that ask him." He thou goar himself was aggressed. ask him." He then gave himself more carnestly to the study of divine things, and became the subject of divine revelations. On one of these occusions, in the 25th year of his age, he says that he was surrounded 25th year of his age, he says that he was surfounded by a divine light; and viewing the herbs and grass in the fields in his inward light, he sawinto their essences, uses, and properties. In like manner, he had revelations of God, nature, the creation, evil, &c., which e embodied in his rumerous writings. Its death took place in 1624. It was no part of Behmen's intention to found a sect. His object was merely to exhort Christians to true and pure life, and to instruct them in the mysteries of the true faith. He himself lived and died a genning Protestant a member of the Luand died a genuine Protestant, a member of the Lu-theran church. Formerly the doctrines of Behmen were viewed with great contempt by all but his own immediate followers; but latterly this unlettered rustic, this man of earnest principle and pious heart, has come to occupy a high place among the philosophers of his country. Hegel places him at the head of modern speculative philosophers, and Tieck and Novalis were enthusiastic admirers of his writings. Professor Maurice, in his article on Moral and Metaphysical Philosophy (Encyclopædia Metropolitana), says "that his obscurity was in a great degree the effect of unacquaintance with scientific language; but effect of unacquaintance with scientific language; but that through it all may be traced deep thoughts respecting God and man, by which philosophers might be greatly profited." After Behmen's death, his opinions spread over Germany, Holland, and England. His works were translated into English by the celebrated William Law, of Oxford. Henry More has written upon the views of Behmen, and it is said that many authorach, overath, from the works of Behmen and it is said that written upon the views of Behmen, and it is sight that many sattograph extracts from the works of Behmen were found among the papers of Bir Isaac Newton, During the Commonwealth, the doctrines of Behmen spread greatly in England, much to the annoyance of the Puritan clergy. Richard Baxter describes the Behmenites as men of greater meckness and more self-control than any of the other sectaries. Though

#### Being

Behmen has still many devoted admirers in the present day, especially in Germany, the Behmenites, as a re-ligious sect, may be said to be extinct. It is impossible, agrous sect, may be said to be extinct. It is impossible, within the limits of an article like the present, to give an intelligible account of the system of Jacob Behmen, and we must therefore refer the reader to Vaughan's Hours with the Mystics, or Francis Octley's Memoirs, 4c. of J. Behmen, Northampton, 1780.

Baine, bee's ing, is a term used in philosophy to destruction and the statement of the statement of

note whatever has a being or existence, either actually in the outer world, or ideally in the mind itself. Not only have the fictions of our mind a being, but even, according to some philosophers, nothing can be said to have a being.

BEIRAM. (See BAIRAM.) BRIT, bite, an Arabic word signifying a tent, hut, or other abode of men. It corresponds to the Hebrew beth, and forms a frequent compound in the names of places; as, Beit-at-Haram, the house of the sanctuary;

sacred house.

or 'sacred house.'

Bel and the Deagon, bel, is the name of an apocryphal and uncanonical book of Scripture. It was
always rejected by the Jewish church, and is extent
neither in the Hebrew nor Chaldee language, nor is
there any proof that it ever was so; hence St. Jerome
terms it "the fable of Bel and the Dragon."

BELAK, be-lat, in Mar., signifies to fasten a rope by winding it several times round a cleat, belaying-pin, or

BELLYING-Pins are wooden pins, made of ash and turned in a lathe, 16 inches long and 12 inch in dia-

meter at the upper end.

BELEMBITES, be-lem-nites (Gr. belemuos, a dart), in Geol., fossil remains of extinct naked cephalopods allied to the squid and the cuttle-fish. They are found in large numbers in the Chalk and Colite, generally as straight, solid, dart-like stones. These relies of crea-tures which thronged the seas of the secondary period have ever been objects of wonder, and the wildest speculations have been advanced to explain their origin. The popular names for them, such as devil's fingers, spectre-candles, arrow-heads, picks, and thunderholts, indicate the different views taken of their nature by the ignorant. To the philosoph-ers of the last

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RELEMNITES.

called were forth from time to time appear to us to be scarcely less absurd than the popular beliefs. It was said to be a product of electric action, and given the learned name of lapis fulniums, or thunderstone. According to other hypotheses it was a stalactic, a crystal, petrified amber, and lastly, when fossils began to be looked upon as actual organic remains, it was held to be the tooth, or perhaps the spine, of some unknown creature. It is now known to be the internal bone or shell of a cephalopod, and corresponds to the slender and insignificant pen of the common squid. Although the most common belemnites are mere tapering stones, some have been found so well preserved that naturalists have been able to form from them a vivid image of the living mollusk. "The belemnite," vivid image of the living mollusk. "The belemnite," writes the unknown author of "Vestiges of Creation," is an elongated conical shell terminating in a point, and having, at the larger end, a cavity for the residence of the animal, placed in the upper cavity, could raise or depress itself in the water at pleasure, by a pneumatic operation upon the air-tube pervading the shell. Its tentacula sent abroad over the summit of the shell searched the sea for prey. The creature had an ink-bag, with which it could muddle the water around it, The creature had an inkto protect itself from more powerful animals; and, strange to say, this has been found so well preserved, that an artist has used it in one instance as a nigment wherewith to delinente the belemnite itself." One genus of the Belemnite family, called *Belemnoteuthis*, and occurring in the Liss and Oolite, is occasionally discovered with the remains and impressions of the soft parts; namely, the mantle, body, and tentacles.

BELIEF, be-leef', is that state of mind in which one acquiesces in some truth, real or supposed. No doubt, every man in the world who believes in anything, even the most superstitious idea that ever found crodence, does so because he has some kind of a vague perception that the object of his belief is real and true. Bu the act of belief itself has puzzled the wise throughout all ages exactly to describe its character. One man alleges the act is intellectual, another says it is morel, a third affirms that it is emotional, and a fourth, who is likely as near the truth as may of the previous three, avers that it bears all those various characters at different times, and when applied to different sub-jects. Now it is intellectual, now it is moral, soon it is emotional; and it is as easy to describe it as it is to give a definition of instinct or of intuition. The reason of this apparent obscurity in the meaning of this word, is because men have no more general term that they are accustomed to apply to the same object. It is, accordingly, impossible to get behind belief, so as intelligibly to describe its character. It is emphatically "the light of all our seeing." There are, properly, four sources from which the sound beliefs of men are made up:—1st there is intuition or instinct; 2nd. there is our ordinary experience; 3rd. there are our scientific convictions, derived from the exercise of the two sources of knowledge, deduction and induction; 4th. there is testimony. These constitute the sources of our real convictions; but feeling and imagination have a great share in giving rise to illusory notions and superstitious beliefs in the minds of men. Man is responsible for every belief, real or illusory, which he maintains, provided, always, it was possible for him to discipline himself properly in the various kinds of knowledge in which he exercises his beliefs. This arises from the fact that we have all power over our minds in directing them to one object or another of study; and if this act, which is admitted on all hands to be volunif this act, which is admitted of an indust to be voluntary, be really so, for every voluntary act we commit, either directly or indirectly, we are entirely responsible. Belief is, no doubt, indirect in its connection with the conscience, but it is not, therefore, wholly irresponsible. Lord Brougham broached the irresponsible view of belief some years ago, in an inaugural address as lord rector of the Glasgow University; since which time it has been much discussed by inquirers into such matters.

BELINVERS, be-lee'-vers, an appellation first given to the disciples of Christ, but, towards the close of the let century, applied to those Christians that had been admitted into the Church by baptism, in contradistinction to catechumens who had not been baptized. and, consequently, were not entitled to church privi-leges. At present, the word is commonly used as sy-nonymous with Christians.

Bril, bel (Sax. bellan, to bawl or bellow), a metallic instrument which gives out a musical sound, caused directly by its own vibrations. The use of The use of bells in religious ceremonies is of great antiquity.

Amongst the Jews the high priest wore small gold bells

on the hem of his tunic. The pracbell at the raising of the host probably owes its origin to this circumstance. Large bells were first introduced into Christian churches at the town of Nols, in Campania, about 500; and diet. abbot A.D. Benedict, abbot of Wearmouth end Jarrow, first employed them



England in A.D. 680. Formerly all large bells were used only for religious purposes, and were manufactured by the monks. The process of casting was made a religious caremony; and, when complete, they were sprinkled with water and christened. A set of bells in perfect

## Bell. Diving

harmony is called "a maiden peal." Slight defects in the tone of a bell can be remedied afterwards. If the cound is too sharp, the bell is turned thinner; if too flat, the diameter of the bell is lessened by cutting the edge. The quality of a bell depends very much upon its shape. Bells with very fine tones have been made of glass; but the nature of the substance is too brittle to admit of constant blows from the clapper. Steel bells also give a good sound; but the vibrations only last for a short time. Ringing changes on peals of hells has always been a favourite emusement in England. It is reckoned that twelve bells would give 479,001,600 changes, which would take ninety-one years to ring at the rate of two strokes to a second. Dr. E. Beckett Denison, Q.C., in his discourse on bells, delivered at the British Institution, furnishes the following list of bells, with their respective weights:—Moscow, cast in 1736 (broken), 250 tons (?); another, 1817, 110 tons (?); three others, 16 to 31 tons; Norgorod, 31 tons; Almütz, 17 tons 18 cst. Vicena cast in 1711 17 tons 14 cst. AT tons, 18 cwt.; Vienna, cust in 1711, 17 tons, 14 cwt.; Westminster (Big Ben), cast in 1856, 15 tons, 83 cwt.; Westminster (Big Ben), cast in 1856, 15 tons, 83 cwt.; Effurt, cast 1497, 13 tons, 15 cwt.; Westminster (85: Stephen), cast 1858, 13 tons, 16 cwt.; Sens, 13 tons (P); Paris, cast 1680, 12 tons, 16 cwt.; Montreal, cast 1847, 12 tons, 15 cwt.; Congre, cast 1449, 11 tons, 3 cwt.; Breslau, cast 1507, 11 tons; Görlitz, 10 tons, 17 cwt.; York, cast 1845, 10 tons, 15 cwt.; Bruges, cast 1880, 10 tons, 5 cwt.; St. Peter's, Rome, 8 tons; Oxford, cast 1880, 7 tons, 12 cwt.; Lucerne, cast 1637, 7 tons, 11 cwt.; Antwerp, 7 tons, 2 cwt.; Brussels, 7 tons, 10 cwt.; Antwerp, 7 tons, 3 cwt.; Brussels, 7 tons, 14 cwt.; Ghent, 4 tons, 18 cwt.; Brussels, 7 tons, 14 cwt.; Ghent, 4 tons, 18 cwt.; Boulogne, new, 4 tons, 18 cwt.; Ghent, 4 tons, 18 cwt.; fourth quarter-bell, Westminster, cast 1857, 4 tons. 10 cwt. (?) Old Lineoln, cast 1610, 4 tons, 8 cwt.; fourth quarter-bell, Westminster, cast 1857, 4 tons. 10 cwt. (?) Old Lineoln, cast bell of Moscow, which is fractured after the manner shown in the annexed engraving, a great deal 17 tons, 18 cwt.; Vienna, cast in 1711, 17 tons, 14 cwt.; the great bell of Moscow, which is tractured after the manner shown in the annexed engraving, a great deal of gold and silver are said to have been thrown in as rotive offerings. The metal has been valued at £06,565. "Big Ben," the largest bell in England, was east in 1856 by Messrs. Warner, of Durham, under the superintendence of Dr. E. B. Denison and the Rev. W. Taylor, at an expense of £3,343, 148, 94. The composition was 22 parts conner and 7 tim. The The composition was 22 parts copper and 7 in. The diameter was 9 feet, 5½ inches; the height 7 feet, 10½ inches. The clapper weighed 12 cwt. This bell, having been found to be cracked, was broken up at the close of the year 1857, and in the following year Mesers. Mears, of Whitechapel, cast another bell with the same metal. This bell, which was named St. Stephen, is somewhat different in form from its predecessor, and is almost two tons lighter. Its diameter is 9 ft.
6 in.; height, 7 ft. 10 in. The clapper is only half the
weight of that of Big Ben, viz. 6 cwt. This bell was struck for the first time November 18, 1858. Like its struck for the first time November 18, 1858. Like its predecessor, it is cracked. The diameter of the bell of St. Paul's is 10 feet, the thickness 10 inches; the clapper weighs 180 lb. (See Acoustics, Bell-Maral.)

- Ref. Quarterly Review, Sept., 1854—Church Bells.

- Bell, Diving. (See Diving-Bells.)

- Belladdnna. (See Arroya.)

- Belladdnna. Lilt, bel-lin-dowl-nd, a very beautiful receips of Amorphia which wend. It is a nation of the

species of Amaryllis (which see). It is a native of the Cape of Good Hope, and was introduced into England in the early part of the last century. The flowering stem is about eighteen inches in height, and bears at its summit a cluster of drooping flowers of a delicate rose-colour.

Bull-Bied (Arapunga alba), a native of Guinea, and distinguished by a fleshy cylindrical appendage above the base of the bill. Generally, this appendage is decorated with a few fine feathers. Its voice is very peculiar, and much resembles the tolling of a bell. Waterton asserts that the sound it emits may be heard at a distance of three miles. It is of a pure white colour, and about a foot in length.

BELL, BOOK, AND CANDLE. (See EXCOMMUNICA

BELLE-DE-NUIT, bel'-de(r)-nue (Fr., beauty of night), the name given by the French to the Marvel of Peru (Mirabile Jalapa), on account of the flowers expanding at night. The name Belle-de-jour (beauty of day) is sometimes given to a species of Convolvulus, the 250

## Bell-Metal

flowers of which close at nightfull. (See MIRABILIS, CONVOLVULUS.)

BELLEBOPHON, beller-o-fon, in Geol., a gen. of fossil shells occurring in the Silurian, Devonian, and Carboniferons strats. As in the existing argument,

the shell consists of a single chamber.

BELLES-LETTERS (Fr.) is a vague, indefinite term, adopted from the French, and may be said to correpond to the Latin litera humaniores, or the English polite literature. It is difficult to say what branches of knowledge are comprised under this term, and what are not, for most of them have at one time been included in, at snother time excluded from it. Generally speaking, it comprises those branches of knowledge speaking, it comprises those branches of knowledge with which the imagination and tasts are chiefly con-cerned,—those that relate to beauty, harmony, gran-deur, and elegance, that tend to soothe the find, gratify the fancy; or move the affections. Poetry, rhetoric, history, and philology, are generally understood to come within the ephere of belles-lettres; logical and ethical studies belong to a higher sphere. "The exercise of taste and of sound criticism," says Blair, "is, in truth, one of the most improving employments of the understanding." "They are very intimately connected with the knowledge of ourselves. They necessarily lead us to reflect on the operations of the imagination and the movements of the heart, and increase our acquaintance with some of the most refined feelings which belong to our frame." They bring to light various quantance with some of the most remed seeing which belong to our frame." They bring to light various springs of action which, without their aid, might have passed unobserved, and which, though of delicate nature, frequently exert a powerful influence on several departments of human life." "Such studies have also this peculiar advantage, that they exercise our reason without fatiguing it. They lead to inquiries acute but not painful; profound, but not dry nor abstruse. They strew flowers in the path of science; and while they keep the mind bent in some degree, and active, they relieve it from that toilsome labour to which it must submit in the acquisition of necessary erudition, or the investigation of abstract truth."

BELL-PLOWER. (See CAMPANULA.)

Bell-Gable, or Bell-Turnet, or Bell-Cot, in Arch.—In some small churches and chapcis, where there are no towers, there is frequently a bell-gable or turret at the west end of the structure, in which the bells-sometimes only one, sometimes two or three-are hung. A few of these erections are of Norman are hung. A few of these erections are of Norman date, but the larger number are later, and many of them are Early English. They are extremely picturesque, and are well placed on small churches and chapels where the funds are insufficient to provide towers. Besides the bell-gable, a smaller erection of a similar kind is often provided for the sanctus bell, on the apex of the eastern end of the roof of the nave.

BELLIGERUNT, bel-lij'-e-rent (Lat. bellum, war, and gerere, to carry on), is a term applied to nations waging or carrying on war against each other.

Bellis, hel-lis, in Bot., the Daisy, a gen. of plants belonging to the nat. ord. Compositae, sub-ord. Corymiterae. The receptacle is without scales, and upon it are arranged two kinds of flowers,—ligulate, or strap-shaped, and tubular. The ligulate flowers, which are white in the common daisy, form the ray, or outer circle. They have no stameus, but each has a single pistil, which, at the top, divides into two branches, forming stigmas. The yellow tubular flowers clustered together within the ray are hermaphrodite; that is to say, they have both stamens and pistils. The involucre is composed of two rows of bracts. The fruit found at the base of every little flower, whether ligulate or tubular, is without a pappus, and contains a single seed. The best-known species is B. perennie, the common daisy. The roots of this are perennial; the leaves are obovate, spathulate, single-ribbed, crenate, and dentate. (See LRAF.) It blessoms nearly all the year round, and is constantly found with opened flowers from March to October. In a charming essay upon this wild plant, Mrs. Lankester writes:—"Throughout Great Britain, we find its tiny bright flowers apringing up on every lawn and grassy plot, by waysides, on mountain-slopes, and is almost every country in

Europe.

Bell-Metal.—Science and experience together have shown that an alloy of 80 parts of copper and 20 parts

#### Bellows

of tin makes the best bell-metal. Bells, however, are made of brass, antimony alloyed with tin, German silver, silver, and gold. The hand-bells found by Mr. Layard at the palace of Nimroud were composed of 1 part of tin and 10 parts of copper. Probably these bells, being of Phosnician manufacture, contained tin which had been obtained in Britain 3,000 years ago. Indian gongs contain 80 parts of copper and 20 of tin. In ordinary bells, lead and zinc are often substituted for tin. When silver is mixed with bell-metal, it injures the tone of the bell.

Bells, however, are made and since are often substituted for tin. When silver is mixed with bell-metal, it injures the tone of the bell.

Bells, however, are

ling air forcibly through a tube. The most ordinary kinds consist of two boards, of a circular or oval form each provided with a projecting handle, and two or three hoops are bent between the hoards. To the edges a noops are bent between the locats. To the edges a piece of leather is nailed, broad in the middle, in order to cover the hoops, and thus form a small chamber, which can be dilated or contracted by moving the handles. A pipe is fastened to the lower board, passing into the chamber, and there is also a round hole in this board, which is covered with a leathern valve opening in-wards. By dilation and contraction, air is inhaled by the valve-hole, and then forced through the nozzle of the pipe in any direction that may be desired. It is used in private dwellings for the purpose of blowing a fire into greater activity: it is also used for forges and furnaces. Strabo attributes the discovery of the bellows to Anacharsis the Scythian. The principle of the hydrostatic bellows, an instrument made for the purpose of showing that the pressure of fluids is as their perpendicular heights, has been applied in the construction of the hydrostatic press. Many operations in manufacturing art require a very high temperature. Formerly this was entirely effected by the bellows; the hot-blast is, however, now generally employed. (See BLOWFIPE, METALLURGY.)
BELLS, in Mar.—On board ship the time is divided

into periods of four hours each, and as each hulf-hour passes it is marked by striking on a bell. This bell is usually hung to the beam of the forecastle, but sometimes it is attached to a beam near the mizen-mast. One stroke on the bell denotes that half an hour has passed, two strokes that an hour has passed, and so on, adding a stroke for each half-hour. Thus, "five bells" adding a stroke for each half-hour. Thus, "tire bells" would signify that two hours and a half had passed, and "eight hells" signifies that the four hours, or complete "watch," is over. The bell on which the time is struck is sometimes used during foggy weather to show that the ship is on a starboard tack; when she is on a port-

tack, a drum is beaten.

BELLY. (See ADDOMEN.) BELOMANCY, be'-lo-man'-se (Gr. belos, an arrow, and manteia, prophecy), denotes a species of divination by means of arrows, common among the Arabs and other eastern nations. It is practised in various ways; but the most common is to shoot off a number of arrows with inscriptions attached to them, and to be guided by the inscription upon the arrow which is first

found.

BELOPTERA, be-lop'-te-ri (Gr. belos, dart, pteron, wing), in Geol., a fossil resembling a belemuite, but less pointed, and having a wing-like projection or process on each side. It occurs in Tertiary strata, and was evidently the internal bone of a cephalopod. The name Belosepia (Gr. sepia, cuttle-fish) is given to another kind of belemuite found in Tertiary deposits; and that of Beloteuthis (Gr. teuthis, squid) to one shaped like a spear-head occurring in the Lins.

BELT, belt (Lat. bullens, a baldrick or girdle), in Astron, a term applied to some dark stripes or zones that appear on the surface of the planet Jupiter paral-

that appear on the surface of the planet Jupiter paralled to its equator. (See JUFITER.) Orion's Belt is tigured by three stars in a direct line with each other, situated horizontally in the centre of the constellation.

Situated horizontally in the centre of the constellation.

BRUTEIN, BELTANH, or BEALTINE, bel'tain, the
name of a great heathen festival, once common to all
the Celtic nations, and traces of which still exist in
some parts of Scotland and Ireland. The name is derived from tine, tire, and Beal, or Bel, the sun, or god
of light; and in the Irish language the month of May
is still called Bealtine. The festival was held on the
lat of May: large fires were kindled on the summits
of the highest hills, and estite were driven through
them. It is said to protect them from contagious disthem. It is said to protect them from contagious dis-

### Beucher

All the inhabitants of the district quenched their fires on that day, and rekindled them from these fires. A similar festival seems also to have been held on the 1st

similar restival seems also to have been held on law law of November. (See MAYDAY.)

BELUGA, be-lu'-gd, a gen. of Cetacsa belonging to the Delphinida, or Dolphins. It has a broad blunt head, and no produced snout; thus differing from the rest of the family to which it belongs. Its form is principally characterized by the softness of its curves, and the clear white colour of its skin, which is so tender the clear watte colour of its skin, which is so tender-that it often fails to retain the harpoon. The belugs also differs from the ordinary family of dolphins in having fewer teeth, which fall out before the animal is old, and it has no dorsal fin. It usually attains the length of thirteen feet, and feeds principally on fish.

BELVIDERS. (See KOCHIA.)
BELVIDERS, or BELVEDERS, bel-ve-deer' (Ital-bella, fair, beautiful; Lat. videre, to see), a name given, in Arch., to a place erected on the top of any building, from which a good prospect of the country around can be obtained. The structure is of Italian origin, and is commonly found in houses at Rome. The Belvidere at the Vatican is one of the most remarkable in existence, being built in the form of a horseshoe, having a gallery inclosed at the back running round the semicircular part, and a balustrade in front. It commands a magnificent view of the country about Rome, extending as far as the Apennines. In France and England the term is applied to summer-houses or buildings erected in gardens and parks, from some of which a good view of the surrounding scenery can be obtained.

Belvisiace. bel'-vis-i-ai'-se-e (from the gen. Bel-

visia, named after its discoverer, P. de Beauvois), a small nat. ord. of dicotyledonous plants, in sub-class small nat. ord. of dicotyledonous plants, in sub-class Calyciflorer, comprehending only two genera, namely, Asterauthos and Aupoleona, or Helvisia. These include four species, which are large shrubs, with smooth leathery leaves, all growing in tropical Africa. The flowers grow in threes, sessile in the axis of the leaves, and are extremely curious. The calyx is a thick leathery cup, divided into five segments. The corolia consists of three divinet whenly of midd notals the consists of three distinct whorls of united petals; the onter one turning back over the calyx; the second one is a narrow membrane divided into numerous segments; and the third forms an erect cup, and contains the stamens, which are united, so as to make a sort of inner cup. The fruit is a soft berry, with large kidney-shaped seeds. The pulp of the fruit is edible, and the pericarp contains much tannin.

BENERIDGE BEDS, bem'-bridj, in Gool., the name given to an important group of upper cocene strata, resting on the Osborne or St. Helen's series, and capped by the Hempstead beds. In the Isle of Wight this group is principally developed. Beginning at the bottom, we find the Bembridge limestone. This bed consists of a pale yellow or cream-coloured limestone, interstratified with clay or crumbling marl, and is from 20 to 25 feet thick. Upon this we find the oyster-hed, a few feet of greenish sands, containing oysters (Ostræa vectensis) in great abundance, capped by a band of hard septerian stone. Resting on this are unfossiliferous mottled clays, alternating with fossiliferous laminated clays and marls. The latter contain the characteristic shell Cyrena pulchra. Lastly we come to maris and laminated grey clays containing

BEN, ben (Heb., son), is a Hebrew word that enters iten, ben (Het, son), is a Hebrew word that enters into the formation of many proper names; as, Benhadad, the son of Hadad; Benjamin, the son of the right hand.—In names of places in Scotland, the Gnelie beann, beinn, beinne, a hill, mountain, summit, pinnacle; Irish, beann; Welsh, bann and pen, are used in a chimic some of the second second. in a similar manner.

Mclania turritissima; for immediately above these we find the black band, forming the base of the Hempstend

BEN, OIL or, an oil obtained from the fruit of the

BEN, OIL OF, an oil obtained from the fruit of the Moringa ptergosperma. It is a thick yellowish fluid, possessing the property of seldom turning rancid, which renders it of great use in perfumery.

BENCHERS, benehi-are, in the inns of court, are the senior members of the society of each house or inn, to whom the government of its affairs is committed; and out of the number one is annually chosen as treasurer. out of the number one is annually chosen as treasurer. orders; but doubtless they were originally sacrificed. The sole power of calling students to the bar, by which

they become barristers, and of disbarring them, and thereby depriving them of their qualification, for misthereby depriving them of their qualification, for misconduct, is vested in them, subject to an appeal to the
judges as risitors of the inn. These inns are four in
number; viz., the Inner Temple, the Middle Temple,
Lincoln's Inn, and Gray's Inn.
BEND, bend (Sux. bendan), in Her., one of the nine
principal ordinaries, occupying a fifth part of the field
when uncharged, but a third part when it has any
device or charge upon it. It is formed by parallel
diagonal lines drawn from lett to right or from the

diagonal lines, drawn from left to right, or from the



BEND.

dexter chief to the sinister base. When the term bend is mentioned without any addition, the bend dexter is always meant. The bend has four diminutives,—the bendlet, balf the width of the bend; the garter; the ribbon; and the cost, or cotice, a narrow stripe generally borne on either side of the bend.

Charges are said to be in bend, or per bend, when they are placed in the direction of the bend from the dexter chief to the sinister base.

BENDING, bend'-ing, in Mar., the tying of two ropes or cables together: thus, to bend the sail is to make it fast to the yard; to bend the cable, to make it fast to the ring of the anchor.

BEND SINISTER (Lat. sinister, the left), one of the nine principal ordinaries, being exactly the reverse of the bend, similarly formed, but by lines drawn from the sinister chief to the dexter base, or from right to left. It has two diminutives; the scarp, half the width of the bend, and the baton, used as an abatement to denote the illegitimacy of the bearer of the coat.

BRNEDICITE, ben'e-dis'-i-te (Lat.), is the name given to the hymn or song of the Three Children in the licry furnace, from the Latin version of it, beginning, Benedicite omnia opera Dominum. The singing of the Benedicite in the Christian churches is very ancient, for it appears to have been in universal use as early as ior is uppears to have been in universal use as early as the time of Chrysostom. In the English church, the Benedicite was, by Edward VI.'s First Book, prescribed to be used during Lent; but, by the present Prayerbook, it may be said or sung at the morning service, instead of the Te Deam, whenever the minister thinks fit.

BENEDICTINE FATHERS, is the name given to cele-brated editions of the works of the Fathers, from their having been edited by some of the most celebrated of

the Benedictine monks in France.

Benedictines, ben'-e-dik'-tins, an order of monks taking their name from their founder, St. Benedict, who flourished in Italy in the early part of the 6th century. They spread very rapidly, and for the next three centuries, almost all the monks in the West might be said to be Benedictines. At first they had no dis-fractive dress, but afterwards they were black; whence they came to be called also Black friars. The decline of monastic discipline led to the reforms of Benedict of Monastic discipline lea to the reforms in Enclose of Aniana in the 8th century, and of the abbot of Clugny in the beginning of the 10th. The Cluniaes, in place of the discordant and uncertain rules that had hitherto existed, made fixed regulations concerning the hours of worship, the obedience, discipline, and government of their monasteries, which were soon imitated throughout Europe. The rules of St. Benedict, as observed by the English monks previous to the Reformation, were as follows: they were obliged to perform their devogo two and two together; every day during Leut they were obliged to fast until six in the evening, and to diminish their usual time of sleeping and eating; but they were not allowed to practise any voluntary aus-terity without the consent of their superior; they never conversed in their refectory at meals, but were obliged to attend to the reading of the Scriptures; for small faults they were shut out from meals; for greater, they were debarred religious commerce and excluded from were debarred religious commerce and excluded from the chapel; while incorrigible offenders were expelled 10,421. (Scc Living, Tithers, Parson.)

11,421. (Scc Living, Tithers, Parson.)

12,421. (Scc Living, Tithers, Parson.)

12,421. (Scc Living, Tithers, Parson.)

13,421. (Scc Living, Tithers, Parson.)

14,421. (Scc Living, Tithers, Parson.)

15,421. (Scc Living, Tithers, Parson.)

16,421. (Scc Living, Tithers, Parson.)

16,421. (Scc Living, Tithers, Parson.)

17,421. (Scc Living, Tithers, Parson.)

18,421. (Scc Living,

the 15th century, this order had 15,107 monasteries, of which, after the Reformation, only about 5,000 were left, and at present there are only about 800. This order has produced a great number of learned men, and it did much in the way of fostering and spreading Christianity, civilization, and learning in the Middle

Ages.

BENEDICTION, ben'-e-dik'-shon (Lat. benedico, I speak well), is the invoking of the divine blessing upon individuals; sometimes, also, upon animals and things. The ceremony of blessing is of very remote antiquity, for we read of the Jewish patriarchs, before they died, invoking the blessing of God upon their children. At a later period, the priests were commanded to bless the people; and Christ himself sanctioned the custom, in that, before parting from his disciples after his resurrection, "he lifted up his hands and blessed them." In the ritual of the Roman Catholic church the benediction, in different forms and words, occupies the benediction, in different forms and words, occupies an important place; and it constitutes an essential part of many of its ceremonics. One of the most imposing of these is when the pope, on Easter Sunday, after mass, in full pontificals, and attended by the cardinals end prelates, pronounces his benediction with et orbi (on the city and the world), from the great gallery in front of St. Peter's church, before many thousands of kneeling spectators. In the liturgy of the Church of England there are but two benedictions, and in the Church of Steptand only one, reconsured at and in the Church of Scotland only one, pronounced at the end of the service.

BENEDICTUS, ben'-e-dik'-tus (Lat., blessed), the name of one of the hymns ordered to be said or sung after the second lesson in the morning service of the Church of England. It is so called from its begin-ning with that word in the Latin version.

HENEFICE, ben'e-fis (Lat. beneficium, a good deed, a favour), in authors of the Middle Age, in used for a fee, sometimes more peculiarly danominated beneficium militare. In this sense, benefico was an estate in land, at first granted for life only; so called because held ex mero beneficio of the donor; and the tenants were bound to swear fealty to the lord, and to serve him in his wars. In after-times, as these tenures became perpetual and hereditary, they left their name of benefice to the livings of the clergy, and retained to themselves the name of feuds. Benefice, in an occlesiastical sense, is a church endowed with a revenue for the performance of divine service, or the revenue itself assigned to an ecclesizatical person, by way of stipend for the service he is to do to that church. All church preferments except hishoprics are called benefices, and all benefices are, by the canonists, sometimes styled dignities; but we now ordinavily distinguish between benefice and dignity, applying dignity to bishopries, deaneries, archdeaconries, and dignity to bishopries, deaneries, archdeaconires, and probendaries, and benefice to patronages, vicarrages, and donatives. Benefices are divided by the canonists into simple and sacerdotal. In the first, there is no obligation but to read prayers, sing, &c. Such are canonicies, chaplainships, chantries, &c. The second are charged with the cure of souls, or the direction and guidance of consciences; such as vicarages, rectories, &c. The Romanista again distinguish benefices into regular and secular. Until the 4th century, the revenues of the Church consisted principally in the revenues of the Church consisted principally in alms and voluntary contributions, and were distributed under the directions of the bishop; but when the Church came to possess lands, part thereof were assigned for the subsistence of the clerks, and called benefices, of which we find some traces in the 5th and 6th centuries. But it does not appear that the allot-ments were positively defined till about the 12th. At first each was contented with a single benefice; but pluralities were by degrees introduced, on a plea that in some places a single benefice was not thought a in some places a single penetice was not connected. By a return to parliament in 1817, the number of benefices in England were stated to be 10,421. (Sce Living, Tirries, Parson.)

Benefice in Commendam is that, the direction

## Denefit of Clorgy

my interest in any funds or estate held in trust by

BERFIT OF CLERGY, ben'e-ft, originally denoted the privilege or exemption which was possessed by the clergy from secular jurisdiction. In early times, clergy-men were in certain cases exempt from punishment men were in certain cases exempt from punishment by secular judges, and could claim their privilegium clericals. This privilege, however, did not extend to high treason. Afterwards, reading, as being at that time almost solely confined to the olergy, came to be the test of one's being entitled to the benefit of clergy. On a condemned man demanding "to be admitted to his book, the judge commonly giveth him a Psatter, and turneth to what place he will. The prisoner readeth so well as he can (God knoweth sometimes very slendegly); then he (the judge) asketh of the bishop's commissary, 'Legit at clericual' (Does he read like a clergyman?). The commissary must say 'Legit' or 'Nou legit'; for these be words formal, and our men of law be very precise in their words formal. \* Legit' or 'Nou legit;' for these be words formal, and our men of law be very precise in their words formal. If he say legit, the judge proceedeth no farther to sentence of death; if he say non, the judge forthwith proceeded to sentence.' In 1888, when reading had become a less rare accomplishment, a distinction was made between the clergy and those who were morely able to read; so that one of the latter class, after having once been admitted to the benefit of clergy, we are not allowed to claim the privilege a second time. was not allowed to claim the privilege a second time unless be produced his orders; and those who had ence claimed the privilege were burned on the hand, in order to mark them. The formality of reading was done away with by 5 Anne, c. 6, which enacted that the bencht of clergy should be extended to all who are curled to it, without requiring them to read. do it, without requiring them to bergy had previously been adopted as a bergy had previously been adopted for form canital punishment for Benefit ress freedon from capital punishment for it was not till 7 & 8 Geo. IV. c. 28, that the coegy was cutirely abolished.—Ref. English term f. n ir - Arts and Sciences.

TENEFIT SOCIETIES. (See FRIENDLY SOCIETIES.)

IFMEVOLENCE, be-nec'o-lens (Lat. benecolentia, from bene, well, and colens, wishing), in Ethics, denotes an entrest desire for the good of mankind, manifesting itself, as ability and opportunity may offer, in acts of kindness and charity towards all. Some philosophers attribute this affection to self-love; others to an instinct inherent in our nature. "It is the benevolent passions only," says Adam Smith, " which can exert themselves without any regard or attention to propriety, and yet retain something about them that is engaging.

BENEVOLENCE, in Eng. Hist., was a means of raising money formerly resorted to by the kings of England, in violation of the Magna Charta. As the name implies, in violation of the Magna Charta. As the name implies, it was nominally a gratuity; but in reality it was a forced loan, exacted with or without the condition of repayment. Edward IV, had frequent recourse to this means of raising money; but by a statute of his successor, Richard III., it was declared to be illegal. Benovolences were, however, exacted by Henry VII., and occasionally, by means of circulars nuder the private live his successors. 13 (Barlas II. stat 1 a.4 seal, by his successors. 13 Charles II, stat. 1, c. 4, provides that no voluntary aid can be raised on behalf of the sovereign but by the authority of parliament; and the Bill of Rights, in Feb. 1689, declares that the levying of money for or to the use of the crown, by pretence of prerogative, without grant of parliament, is illegal.

BENGAL LIGHT, or BENGAL FIRE, ben-gawl', a mixture composed of one part of tersulphide of antimixture composed of one part of tersulpinde of anti-mony, two parts of sulphur, and six of nitrate of potash. The materials are reduced to a fine powder, and tho-roughly mixed. When ignited, the mixture burns, giving out a remarkably brilliant and searching light, It is used in cases of shipwreck, and is capable of illu-minating the sir for a considerable space around. As the consequently, the Bengal light cannot be used with safety in inclosed or covered places; it is, however, much used in pyrotechny.

BENGALER LANGUAGE. (See HINDOSTAN, LANGUAGE.)

GUAGES OF.)

BENISH DAYS, be'-nish, among the Egyptians, is a term applied to three days of the week (Monday, Wednesday, and Saturday), from their being days of less ceremony in religion than the other four. They slowly changed into a crystalline mass.

#### Benzoine

are named from the benish, a garment of common use, not of ceremonious.

BENISON. (See BENEDICTION.)
BENISON. (See BENEDIX.)
BENISON. (See BENEDIX.)
BUNT GRASS, the common name for the gen. Agreetis

(which see).

BENZILE, ben'-sil, in Chem., an oily solid, crystal-lizing in hexagonal prisms, formed from benzoine by the setion of chlorine.

BENZINE, ben'-zine, another name for benzole. (See BENZOLE.)

RENZOENE, ben'-zo-ene, another name for toluyl, which see). This word has been abandoned by Engwhich see). lish chemists on account of its being easily confounded with benzoine.

BENDUE ACID, ben-zo'-ik (C<sub>14</sub>H<sub>2</sub>O<sub>3</sub>HO).—An acid obtained from gum-henzoin. It is also found in the balsams of Tolu and Peru, in storax, and in the urine of herbivorous animals. It is easily prepared by sublimation. The powdered gum-henzoin is placed in a shallow iron pan which is covered with the country of the powdered gum-henzoin is placed in a shallow iron pan which is covered with the country of the powdered gum-henzoin. with a cone of bibulous paper. A heat of 300° Fahr, is applied to the pan, and the whole apparatus is covered by a second cone much larger than the first, made of non-absorbent paper. The vapours of benzoic acid rise through the bibulous cone, and condense on the inside of the larger one; being thus prevented from fulling back into the heated gum-benzie. zoin. Benzoic acid forms white glistening needles, having an agreeable aromatic odour, and a hot, bitter taste. It melts at 24% sublimes at 293%, and boils at 462°. Its vapour may be kindled, burning with a smoky flame. It dissolves in 200 parts of cold water and 25 of hot. It is readily soluble in ether and alcohol. It combines with the alkalies, earths, and metallic not. It combines with the alkalies, earths, and metallic oxides, forming benzoates. It forms sulpho, nitro, and chloro-benzoic, by the substitution of atoms of sulphuric acid, perexide of nitrogen, and chlorine, for atoms of hydrogen. Its other compounds are too numerous and unimportant for mention here.

BENZOIC ALCOHOL, the sleohol of the benzoic series,

the hydrated oxide of toluyl, i.e.

 $C_{14}H_1 + O + HO = C_{14}H_6O_2$ Toluyl, or benzoene. Benzoic alcohol. It bears the same relation to benzoic acid that vinous

alcohol does to acetic acid. Oxidizing agents convert heavier than water, and boiling at 400°.

Bunzoic Ether.—Oxide of benzoene, or toluyl. It

is procured by heating benzoic alcohol and anhydrous boracic acid together in a closed vessel for some hours.

BENZOIC GROUP.—One of the groups of the benzoic ries (which see). The members of the benzoic group series (which see). The members of the benzoic group are analogous to those of the vinic or ethylic group, being all derived from a primary radical Lenzoil, us those of the latter group are from othyl (which see). They are nearly all obtained from oil of bitter almonds.

BENZOIC SERIES .- Avery perfect and numerous series of organic compounds, containing eight groups :

1. Phenylic group. 2. Quinonie ,,

5. Anisie group.
6. Cinnamic ,,
7. Naphthalic ,,

4. Salicylic , 8. Indigotic ,, The benzoic series has lately been rendered very im-

portant from containing beuzole and aniline, the sources of the coal-tar dyes.

BENZOIN, OF GUM-BENJAMIN, ben-zo'-in, or ben'-coin, a fragrant balsam obtained from the Benjamin-tree. (See STYRAX.) It exudes from incisions in the bark, and soon hardens by exposure to the air. Two kinds are distinguished in commerce by the names of Siam and Sumatra benzoin. The former is most esteemed in England. Benzoin is used in medicine as a stimulant expectorant. It is, however, principally employed for the preparation of benzoic acid, and as an ingredient in the incense used in Greek and Roman Catholic churches. It is also an

in Greek and Roman Cutholic churches. It is also an ingredient in funigating pastiles and court plaster. The agreeable edour produced by burning benzoin is due to the evolution of the vapour of benzoic acid.

Benzoine, benzoi-ine.—This compound must not be confounded with benzoin and benzone (both of which see). It is isomeric with essence of bitter almonds, hydride of benzoyl, from which it is produced by the action of an alcoholic solution of potash, the oil being slowly changed into a crystalline mass.

BENEOLE, ben'-role (C<sub>1.0</sub>H<sub>a</sub>).—A hydrocarbon of considerable importance, derived from coal tar. It was first obtained by Faraday from a liquid produced by compressing oil gas, and was called by him bicarburetted hydrogen. Mitscherlich afterwards obtained it from benzoic acid; and latterly Mansfield has procured it in large quantities from coal-naphtha and gas-liquor. It in large quantities from coal-naphtha and gus-inquor. As a simple, volatile, colourless, and mobile liquid, with a peculiar odour, having a specific gravity of 0.85, and boiling at 177°. Exposed to a temperature of 32°, it condenses into crystalline masses, which melt at 40°. It is insoluble in water, but dissolves freely in alcohol, ether, and oil of turpentine. It is greatly used in the arts, being an excellent solvent for india-rubber, guttapercha, wax, camphor, and fats. The property of dissolving fats and oils, added to its great volatility, randers it very useful for removing grease-stains from articles of dress. It is sold for this purpose under the name of "benzine collas," at about three or four times its real value. It has lately received a most important application as the source of aniline (which see). It forms substitution compounds with bromine, chlorine, and iodine, by the replacement of one, two, or three atoms of hydrogen by one, two, or three atoms of these bodies, giving rise to mone, bi., and tri-chlorbenzole, &c. It also forms similar compounds with peroxide of hydrogen, the most important of which for these barries and the final control of the cont with peroxide of hydrogen, the most important of which is nitro-benzole, or artificial oil of bitter almonds. It is made by adding benzole very gradually to funning nitric acid. On cooling, the nitro-benzole separates as an oil, and is purified by washing and redistillation. It is a yellowish oil, which solidifies in needles at 37°, and boils at 415°. It has a sweet taste, and its odour closely resembles that of bitter almonds. It is much used in perfumery under the name of "essence of mirbane." Its principal use is in the manufacture of mirbane for dwales a purposes hyposesia such batter? of milius for dyeing purposes, by passing sulphureture of anilius for dyeing purposes, by passing sulphureture hydrogen through it, or by acting on it with protacetate of iron. Benzole is also known as bearing and

BENZOYL, hen'-zoil (C1, H2O2), the oxygen radicle of the benzoic group, from which all its members are derived, as all the members of the vinous group are derived from othyl. The following examples will show this analogy :

 $\begin{array}{lll} \log y & & & \log y & & \\ \mathbf{C_1} + \mathbf{H_3} \mathbf{O_2} + \mathbf{HO} + \mathbf{O} & = \mathbf{Acetic\ acid.} \\ \mathbf{C_1} + \mathbf{H_3} \mathbf{O_2} + \mathbf{HO} + \mathbf{O} & = \mathbf{Benzoic\ acid.} \\ \mathbf{C_4} & \mathbf{H_3} \mathbf{O_2} + \mathbf{H_3} & & = \mathbf{Alcohol.} \\ \mathbf{C_3} & \mathbf{H_4} \mathbf{O_3} + \mathbf{H_3} & & = \mathbf{Benzoic\ alcohol.} \\ \end{array}$ = Benzoic alcohol

BRNZOYL, HYDRIDE OF (C1.4H.O2H), essence or oil of bitter almonds.—The hitter-almond cake, left after he extraction of the tixed oil, is mixed with water and fermented, until the whole of the amygdain is decomposed. The mass is then distilled, and the distillate is purified by agitating it with milk of lime and chloride of iron. The hydro-cyanic acid contained in it is thus transformed into Prussian blue. Pure hydride of benzoyl is not poisonous. It is a limpid, highly-refractive, inflammable liquid, which boils at 356°, and dissolver in 30 north of water. dissolves in 30 parts of water. Alcohol and ether dis-solve it in all proportions. Exposed to the air, it gradually absorbs oxygen, and becomes converted into benzoic acid. It is the aldehyde of benzoic alnohol :--

 $C_{14}H_{8}O_{9} - H_{9} = C_{14}H_{8}O_{9}$ Benzoic alcohol. Hydride of benzoyl.

Braderidacem, ber'-ber-i-dai'-se-e, in Bot., the Bar-berry fam., a nat. ord. of dicotyledonous plants, in the sub-class Thalamilora, consisting of shrubs and herbaccous perennials. The leaves are alternate and compound; frequently they appear to be simple; but, in such cases, it will be found that the blade is articulated to the petiole, which is evidence of their compound mature. The atem is often spiny, but generally free from hairs. The spines are nothing more than the bardened weins of some of the leaves between which the parenchyma is not developed. The flowers are sometimes solitary, sometimes in racemes or panicles. The calve consists of three, four, or six deciduous sepals; the petals are hypogynous, and either equal sepais; the petais are hypogynous, and either equal any decided progress in civilization. They are conto this sepais in number, and opposite to them, or twice stantly fighting, either samongst themselves or with the small stantly fighting. Their dwellings are mostly clay number, and opposite to them; the anthers are two-called, each cell opening by a curious recurved valve their villages. The mines of lead and iron ore in the 254

from the bottom to the top; the carpel is solitary, and has but one cell; the fruit is either a berry or a capsule. The order includes twelve geners, which together contain 100 species, natives of the temperate parts of Europe, Asia, and America, some being exceedingly common in the mountainous regions of the north of India. The plants have acid, astringent, and bitter properties; their acidity is due to the presence of oxalic acid.

Oranic acid.

Bribbing, ber'-be-ris, in Bot., the typical gen. of the nat. ord. Berberidacea, consisting of numerous species, found in temperate climates in most parts, except Australia. These are shrubs, often spiny, with yellow flowers and acid berries. The three whorls of organs in the flower are each made up of six parts: organs in the nower are each made up of six parts: thus, there are six sepals in the calvx, six petals in the corolla, and six stamens. The latter are remarkable for their irritability; for if touched at the base by an insect, or even with the point of a pin, they start up from their natural reclining position, and close upon the pistil. The most interesting species is B. wilgaris, the common barberry, which is usually a bush from four to six feet high, but which, in Italy, sometimes becomes as large as a plum-tree. It is a very ornamental plant, especially when covered with fruit. The berries are of an oval shape, and, when ripe, generally of a bright-red colour, but sometimes whitish, yellow, or almost black. They are very acid, and not fit to be eaten raw; but when boiled with

sugar, they form a most refreshing preserve. They are sometimes pickled, to be used for garnishing dishes, and occasionally they are put into sugarplums or comnts. The bark and stem are very astringent, and yield a bright yellow dye. A fungus, which has been named Æcidium berberidis, is frequently found on the underside of the leaves; und the common, but erroncous opinion,



that the minute spores of this parasite will produce rust in corn, has prevented the general employment of the barberry as a hedge-plant, for which it is admirably adapted. Of the numerous product of Parkers which is the same and the same rous species of Berberi: which are cultivated in Britain as ornamental shrubs, the finest is undoubtedly B. aristata, the bristle-leaved barberry. This is a hardy evergreen, predacing excellent fruit. It is a native of Nepaul, and was introduced into this country about

forty years ago.

BEREERS, ber-bers (Lat. barbari).—The inhabitants of the northern part of the Great Desert and the mountainous districts of Barbary. The whole of these scattered tribes are the descendants of the aboriginal inhabitants of Northern Africa. Their number is calcu-lated to be at the present time between three and four millions. They are of the middle stature; their commillions. They are of the middle stature; more com-plexion varies from red to yellowish-brown; and they are strongly and compactly made. The head is much more European than African in type. Their eyes and hair are dark, and they are cruel, suspicious, and im-placable in their disposition. In nocient times the Borbers formed the largest part of the population dwelling on the northern coast of Africa; but upon the great Arabian invairation, in the 11th centure, they awaining on the northern coast of Africa; but upon the great Arabina immigration, in the 11th century, they were driven back to the mountains and desert regions, where they now live. In Algeria they are called Kabyles, and are as yet unconquered by the French. In Morocco they are called Shelloch; and in Tripoli they only pay a nominal allegance to the Turks. The Berbers who inhabit the desert have become much upixed with the very range and are called Turks or mixed with the negro race, and are called Tuarie, or Tawarek, by the Arabs. The whole race, at the present day, seem to possess a wild spirit of independence. which prevents them from uniting together or making any decided progress in civilization. They are con-

#### Berchta

Bernicle Geese

Atlas Mountains are worked by them. They have water-mills and oil-presses, and many of them have large herds and flooks of cattle and sheep. They are also agricultural, and have an especial liking for the rearing of fruit-trees. The Berbers were formerly Christians; but since the Arab invasion they have all become Melaymetra.

become Mahometans.

BERGHTA, bairg'-ta (Old Ger. perdata, lightning, shining; whence the name Bertha), in German Myth., is a spiritual being, probably the same, under a differ-ent name, as the Hulda of North Germany; but in North Germany, Halda is regarded as a benign spirit; whereas, in South Germany, Berchta is looked upon as a malevolent being, and her name is made use of to frighten disobedient children. Berchta is especially charged with the overlooking of spinners.—Ref. Brock-Convertations Lexikon.

HEBBANS, be-re'-dne, in Ancient Church Hist., were the inhabitants of Berea. They are highly commended in Scripture for their ready reception of the

Gospel, upon a fair and impartial examination of its agreement with Old Testament prophecies.

Bergans, in Modern Church Hist., a sect of dissenters from the Church of Scotland, who take their name from, and profess to follow, the example of the ancient Bereaus, in building their system of faith and practice upon the Scriptures alone, without any regard to human authority. Their founder was Mr. John Barclay, who, in 1773, left the Church of Scotland because he had not been presented to the parish church of Fettercairn, though the people were unanimous in his favour. The Bereans agree with the great body of Christians respecting the doctrine of the Trinity, and with the Calvinists regarding predestination and election. They differ from other sects in rejecting all natural religion; in holding faith to be a simple cre-dence of God's word, and always accompanied with a personal assurance of salvation; in considering un-belief as the sin against the Holy Ghost; and in interpreting almost all the Psalms as typical or prophetical of Jesus Christ, and reckon it a perversion to apply any psalm to individual spiritual experience. The Bereaus were at one time pretty numerous in Scot-land, but they are now nearly extinct.

BERENGARIANS, ber-en-gair'-i-ons, in Eccl. Hist., a denomination that arose in the 11th century, and adhered to the opinions of Berengarius, archdeacon of Angers, who apposed the Roman Catholic doctrine of Angers, who exposed the Monka Catholic detrills of transubstantiation, and usserted that the bread and wine in the Lord's Supper were not really and essen-tially, but only figuratively, changed into the body and blood of Christ. The Roman Catholics ranked the Berengarians among the most dangerous of heretics.

BERGAMOT, OIL OF ESSENCE OF, ber'-ga-mot, a fragrant essential oil, obtained by expression or distil-lation from the rind of the Bergamot orange. (See CITRUS.) It is extensively employed in perfumery for scenting pomades, and as an ingredient in most compound essences; such as eau de Cologne, eau de mille-

fleurs, and Jockey-club bouquet.

BERG-MAHL, bairy'-mal (Sweddish, mountain-meal).—
The name given to a whitish earth, consisting almost entirely of the flinty shields of microscopic plant-growths. (See DistrIGMACE.E.) It occurs in bog and aucient lake deposits in many parts of Northern Europe, and, during times of great scarcity, it has been, mixed with flour, eaten as food. Some writers assert that hundreds of cart-loads are consumed every year by the inhabitants of the north of Sweden. From analysis, it does not appear to contain any positive

BERIBERI, ber-e-ber-e' .- A disease common in Cevlon and other parts of the East Indies, characterized by difficulty in breathing, weakness, stiffness, and a sen-sation of numbness in the lower limbs, a bloated appearance of the face, and dropsical swelling of the whole The disease commonly comes on slowly, and terminates in the course of three or four weeks; but sometimes it attacks suddenly, and destroys the patient in from six to thirty hours. The causes of this disease in from six to thirty hours. The causes of this disease are not well understood. It is generally supposed to arise from exposure to cold damp air, and the want of stimulating and nourishing diet. Great difference of opinion also exists as to the best mode of treating this disease, some regarding it as a disease of debility, and,

consequently, have recourse to stimulants; others, con-sidering it to arise from increased internal action, residering it to arise from increased internal action, resort to blood-letting, &c. This mode appears to be that most generally recommended. The chronic, paralytic affection, termed barbiers, also common in India, was, until recordly, confounded with this acute disease. Barbiers is a disease of nervous debility, and, therefore, to be treated with tonics, cordisle, and nutritive diet. It commences with weakness, trembling, and a pricking sensation of the legs, thighs, and arms. Loss of appetite, indigestion, and emaciation, soon follow, and at length, if the disease continues, the muscles become paralytic. become paralytic.

BERLIN PORCELAIN, ber-lin'.—A peculiarly hard white porcelain manufactured at Berlin, and much prized by chemists for its valuable properties. Tubes, capsules, crucibles, and other vessels used for chemical purposes, are made of a wonderfully thin and white variety. They do not crack whon heated, and remain intact under the action of the most powerful chemical agents. They replace platinum when required for the ignition of precipitates, containing easily-reduced metals which would destroy a platinum crucible. They are also of great value in testing, where the resulting

precipitate is small, but coloured.

BERLIN-WOLLWORK. (See EMBROIDERY.)
BERME, or BERM, berm (Fr. berme), in Mil., a piece of ground projecting horizontally from the foot of a rampart on the outside, forming a sort of pathway between the rampart itself and the scarp of the ditch surrounding the fortification. It is generally about surrounding the fortification. It is generally about three feet in width; if broader than this, it is called the chemin des rondes, and serves for the passage of troops from one part of the works to another outside the walls, or for officers when going their rounds to see that the sentrics and guard are doing their duty. Sometimes the berme has a low wall on the edge of the ditch, or a row of palisades sloping outwards. A broad berme tends to prevent the ditch from being filled with rubhish when the rampart is exposed to an enemy's fire; but it has its disadvantage in offering a place on which the assailing party may effect a lodgement, and plant their ladders for taking the place by escalade.

BERNARDINES, ber'-nar-dins.—An order of monks named after St. Bernard, a celebrated Franciscan friar of the 14th century, by whom the order was reformed, but not founded. Their origin dates from the 12th century, and they differ little from the Cistercians. (See CISTERCIANS.)

BERNICLE GERSE, ber'-ni-kl.—The bernicle geese are marine in their habits, and feed almost entirely on algon and grass-wracks (Zostera marine). Like the common goose, they are only winter visitors to our climate, and pass during the summer to the highest control of the common grass during the summer to the highest control of the contr northern latitudes. The bird owes its name to a ridi-culous notion. It was formerly believed (it can scarcely be said that the belief is to this day entirely abandoned) he said that the belief is to this day entriefy someoned that these birds were produced from the common beruacle, or harnacle, the latter originating, in their turn, from the fruits of a particular tree, whose branches dipped into the water. "There is," says Gerard (who lived in the reign of Queen Elizabeth), "a small island in Langshire called the Pile of Foulders (on the west side of the entrance into Morecombe Bay, about fifteen miles south of Ulverston), wherein are found the broken pieces of old and bruised ships, and also the trunks and bodies, with the branches of old and rotten trees cast up there likewise, whereon is found a certain spume or froth, that in time hardeneth unto certain shells in shape like those of the muskle, but sharper pointed, and of a whitish colour, wherein is contained a thing in form like a lace of silke finely woven, as it were, together; one end whereof is fastened into the inside of the shell, even as the fish of oisters and muskles are; the other end is made fast into the helly of a rude mass or lump, which in time cometh to the shape and form of a bird: when it is perfectly formed the shell gapeth open, and the first thing that appeareth is the gapeth open, and the first thing that appeareth is the aforesaid lace or string; next come the legs of the bird hanging out, and as it groweth greater it openeth the shell by degrees, till at length it is all come forth, and hangeth only by the bill. In short space after it cometh to full maturitie, and falleth into the sea, where it gathereth feathers, and groweth to a fowl bigger than a mallard, and lesser than a goose, which the people of

# Berry

Lancashire call by no other name than a 'tree-goose;' which place aforessid and all those parts adjoining do so abound therewith that one of the best is bought for three pence."

BEREY, in Bot. (See Bacca.)
BEREARII, ber-sair i-i, is a term used by writers of the Middle Ages to denote a kind of hunters who pursucd wild beasts. The derivation is doubtful; by some it is said to come from bersare, to shoot with a bow, by others from bersa, the sence of a park.

BERIH, berth, in Mar., the station in which a ship

rides at suchor; also an apartment where any number of the officers or ship's company mess and reside. In a man-of-war there is generally one of these between

every two guns.

BERTHOLLETIA, ber-tol-le'-ti-it (so named in honour of Berthollet, the French chemist), in Bot., a gen. of plants belonging to the nat. ord. Lecythidacea. The only species known is B. excelsa, a majestic tree, growonly species known is B. excelsa, a majestic tree, growing to the height of 100 or 120 feet, which forms vast forests on the banks of the Orinoco. The leaves of this plant are about two feet long and five or six inches wide. Its fruit is a round woody pericarp, filled with seeds or nuts, and so strong that it cannot be broken without a sledge-hammer. The seeds more or less approach a triangular shape, and hate hard wrinkled shalls. These sometime in fact they wall-known shells. These constitute, in fact, the well-known Brazil nuts of the shops, also known in commerce as Juva, Castanha, and Para nuts. They yield an oil well adapted for burning; but the 50,000 bushels imported annually into this country from Brazil are chiefly used as food. The kernels are said to be deliwhen quite fresh; but, unfortunately, they are apt to become rancid, on account of the quantity of oil they contain.

BERTL. (See AQUAMARINE.)
BERTLIANS, be-ril'-li-rius, in Eccl. Hist., a sect of heretics that arose in the 3rd century, and took their name from Bervlius, an Arabian bishop of Bozrah.
They held that Christ did not exist before Mary; but that a spirit, issuing from God himself, a portion of the divine nature, was united to him at his birth .- Ref. Mosheim's Ecclesiastical History.

BESTLERI, bes-ti-air'-i-i, men who fought with wild

beasts in the



Roman amphitheatre, who were exposed to them by a decree of They law. were different from the glafrom distors, who fought with each other. The bestiarii were regularly trained and paid for their services. and greatly increased during Empire. the

The illustration is copied from an ancient bas-relief. BESSEMBER'S PROCESS FOR REFINING IRON, bes'-se-mer.—This is a process patented by Mr. Bessemer in 1856, for converting pig-iron more rapidly into malle-able iron and steel. The ordinary methods for accomplishing this object were very slow and tedious; and air was admitted very sparingly to the metal. Mr. Bessemer, on the contrary, in his operations forces air into and upon the iron. In the first place, he conveys the liquid metal direct from the blast-furnace to a large covered wrought-iron vessel, lined with fire-clay; atmospheric air is then forced through the liquid iron by means of a fire-clay pipe passing through the vessel and dipping into the fluid metal. This pipe is conneeded with a hot blast; and, as the air passes when the iron, its oxygen comes in contact with the carbon the iron, its oxygen comes in contact with the carbon the iron, its oxygen comes in contact with the carbon the iron, its oxygen comes in contact with a lot blast; and, as the air passes when it is not blast; and carries them off. This is and other impurities, and carries them off. cooled. When hard, it is broken up and conveyed to a puddling-furnace, where jets of steam and air are fored into and upon the iron, when it becomes molten. for the day's consumption; and a buyo is there offered 256

#### Betel

The steam and air together act upon the metal, the oxygen converting the carbon into carbonic soid. The steam is decomposed and the hydrogen escapes, while the oxygen unites with the iron, forming oxide of iron, which is again decomposed, the oxygen uniting with the carbon to form carbonic oxide; while at the same time the iron is reduced to the metallic state. If there is any sulphur present, it is converted into sulphurous acid and sulphuretted hydrogen. Mr. Bessemer also invented a process by which he converted pig-iron into wrought-iron and steel in one operation. Although the principles of the process were right theoretically, the principles of the process were right theoretically, the invention did not prove advantageous at the cut set, for the reason that a great quantity of good iron was lost through oxidation. Ultimately, the process became perfectly successful. (See Ron and STERL.)

BETA, bo'-/a, in Bot., the Beet, a gen. of plants belonging to the nat. ord. Chenopodiacee, and charaterized by a 5-cleft perianth, five stamens inserted on a fleshy ring surrounding the ovary, and the fruit adhering to the calyx, and collected in clusters of two or three. The species are found in Europe, the north of three. The species are found in Europe, the north of Africa, and the western parts of Asia. B. vulgaris,

the common beet, grows along the whole coast of the Mediterranean, and is cultivated in European gardens for its sweet, tender, and dark-red root, which is chiefly used in England as a salad, but in France and Germany as a common table vegetable. It is also cultivated on a large scale in many parts of the world as a source of sugar; and it is believed at the present time that about 400,000,000 lbs. of beetroot sugar are



annually produced in BRETROOT.

Europe. (See SUGAR.)

The beet used for this purpose is considered to be a variety of B. vulgaris, and is known as the sugar-beet. The mangel-wurzel, so valuable as a field-crop for feeding cattle, is another variety, and is distinguished by botanists as B. rulgaris, var. campestris. The white beet cultivated in gardens for the sake of its

white beet cultivated in gardens for the sake of its leaves, which are used as a substitute for spinach, is also merely a variety of the same plant.

Better, be-tel.—The name usually given to a narcotic masticatory, used by the Malays and other Eastern races. It is prepared by rolling up long pieces of the betel-pubter (see Aurca) in the leaves of the betel-publer (see Curval). (see CHAYICA), previously dusted on one side with the quickline of calcined shells. When chewed, the betel promotes the flow of saliva, and lesseus the perspiration from the skin. It stains the mouth, teeth, and lips red; an effect which, though disgusting to Europeans, is considered ornamental by the natives. imparts an agreeable odour to the breath, and is sup-posed to fasten the teeth, cleams the gums, and cool the mouth. The juice is generally swallowed. The the mouth. The juice is generally swallowed. The narcotic effects of this masticatory have not been experimentally investigated by travellers. To one not accustomed to betel-chewing, the nut is powerfully astringent in the mouth and throat, while the quicklime often removes the skin and deadens the sense of taste. After a while it causes great piddiness. On those accustomed to use it, however, the betel produces weak, but continuous and sustained, exhilarating effects; and out continuous and sustained, exhilarating effects; and that these are of a most agreeable kind may be inferred from the very extended area over which the practice of betel-rhewing prevails. Professor Johnston believed that the coveted effect on the system is the result of the combined influence, first, of the constituents of the nut; second, of those of the fresh pepper; and third, of the substances which are produced or evolved in the mosth in consequence of the chemical science. in the mouth in consequence of the chemical action of the lime and of the saliva upon the ingredients of both nut and leaf. In Lucon one of the Philippines, Meyer found in every corner of the house a little box or dish,

## Bethesda

to every one who enters, just as a pinch of shuff or nips is in other countries. Travellers, and those who work in the open air, earry the buyos for the day in little boxes or bags. The preparation of the betel falls on the female members of the family, who, during the forenous may generally he seen lying on the ground forencen, may generally be seen lying on the ground making buyos. These are consumed very rapidly; for maning curos. These are consumed very rapidly; for every man who can afford it puts a fresh one in his mouth at least every hour. "We have no means," writes Professor Johnston, "of estimating the absolute Quantity of this nut which is consumed yearly by the Asiatic nations; but it must be very great. It is chewed by probably not less than fifty millions of men. If we allow to each chower ten pounds which the contract of the co If we allow to each chewer ten pounds-weight a year, which is less than half an ounce a day, this would give the enormous consumption of five hundred millions of pounds-weight every year! Only tobacco, among the narcotics in common use, is used in larger quantity than this."—Ref. Chemistry of Common Life.

BETHESDA, TO LIE AT THE POOL OF, be-thes'-da, is a

BREVENA, TO LIE AT THE FOOL OF, be-ther-dd, is a colloquial phrase in Germany, employed in speaking of theological candidates who are waiting for a living. BRINLEMILMITES, beth-te-mites, called also Starbearers, an order of monks that appeared in England about the middle of the 13th century. But little is known respecting them. They were distinguished by a red star having five rays, which they wore on their breast, in memory of the star which appeared to the wise men of the East. They had a settlement at Cambridge. Another order of the same name was founded on the island of Teneriffe, which has forty houses, chiefly in the Canary islands; but they are also to be found in the Spanish West Indies.

BETROTHMENT, be-trother-ment (Goth. traum, to

BETROTHMENT, be trothe' ment (Goth. traunn, to trow), is a mutual engagement or promise by a man and woman, with a view to a future marriage. The word and woman, with a view to a future marriage. The word literally denotes the giving one's troth, that is, true faith or promise. Among the ancient Jews, the betrothing was performed either by a writing or a piece of silver given to the bride. Frequently, the engagement was entered into very early in life, though the actual marriage did not take place till the parties were of a proper age, and generally a twelvemonth or more elapsed between the betrothment and the marriage. During this interval, the young people had liberty to see each other, which was not accorded to them before; and the woman was considered as the lawful wife of him to whom she was betrothed. The engagement could not be broken off by the man without a bill of could not be broken off by the man without a bill of divorce; and if the woman was unfaithful, she was treated as an adulteress. Betrothment amounts to the same with what is called by civilians and canonists sponsalia or espousale, sometimes desponsation, and by the French, flançailles. Betrothment is either solemn, the French, flançailles. Betrothment is either solemn, made in the face of the church, or private, made before witnesses out of the church. To betroth by giving arrha, or earnest, is called by Middle-Age writers subarrars. Betrothment being of the nature of a contract, is subject to the same laws and conditions as other contracts. It can only be recognized as valid between persons legally capable of entering into such a consequent and in viting of effected through force. an engagement, and is vitiated if offected through force, fraud, or intimidation. In Germany, where betroth-ment is still common, there are various laws in force ment is still common, there are various laws in force regarding it. The consent of the parents is always necessary if the parties are under age; but if the parents withhold their consent unreasonably, the permission of the judge may be obtained to enter into the contract. If the opinions of the parents are diverse, the law gives effect to that of the father. In some parts of Germany, the consent of the relatives and the research of witnesses are required to add the presence of witnesses are required to render the contract valid; in others, such a contract is not only invalid, but the parties to it are punishable. By the common law of Germany, however, betrothments are valid in every case in which consummation or consecration by the priest has taken place. The parents, in such cases, are not allowed to apply for a dissolution of the contract one of the contract of the contract. In such cases, are not anowed to apply for a dissolution of the contract, mor can they refuse their consent, except for highly important reasons. In case of refusal to fulfil the contract by marriage, the injured party is allowed as action at law, to campel its performance; but from the crils that result from unhappy marriages, the means resorted to to compel its fulfilment are never that the contract when the crils that the compel its fulfilment are never that the contract when the crime the compel is a short imprisonment. great,—usually a small flue or a short imprisonment.

## Bevel

The betrothment generally takes place in a small circle of relations and friends. In Russia, the betrothment now forms part of the marriage ceremony. In Eng-land, formal betrothments were usual down to the time of the Reformation. The ceremony is said to have consisted in "the interchangement of rings, the kiss, the joining of hands, to which is to be added the testi-mony of witnesses." Whoever, after betrothment, remony of witnesses." Whoever, after betrothment, refused to proceed to marriage, was liable to excommination, till that species of punishment was abolished by 26 Geo. II. c. 33. The only remedy now for the aggrieved party is an action at common law for breach of promise of marriage.

BRTING. (See GAMMG.)
BRTULA, bet'-u-la, in Bot., the Birch, a gen. of trees or shrubs belonging to the nat. ord. Betulacen. With the exception of B. antarctica, an evergreen shrub found in Terra del Fuego, all the species flourish beyond the tropic in the northern hemisphere. B. aba, the common birch, is one of the most beautiful of our forest trees, and is found in most of the northern parts of Europe and Asia. Under favourable circumstances it grows to the height of sixty or even seventy feet; but as it approaches both the northern and southern limits of its native region, it gradually decreases in size, and ultimately appears as a mere bush. The leaves are small, of an ovate-triangular shape, and doubly serrated. The bark is smooth and silvery white and the outer layers are therewed. white, and the outer layers are thrown off as the trunk increases in diameter. This tree yields useful timber for turnery, hoops, fish-barrels, cattle-yokes, and other articles in which lightness is of more importance than durability; the wood is also employed for making char-coal. The bark is valuable as a dye-stuff, and, being exceedingly tough, is turned to a variety of uses by the exceedingly tough, is turned to a variety of uses by the poor of Northern Europe. Light boats, or canoes, sre formed of it by the Russians on the Volga; it is sometimes employed instead of slates for roofing houses, sometimes twisted into ropes, and is even used for making hats, shoes, and drinking-vessels. The outer layers yield an oil which is much prized by the tanner; it is this which gives Russia leather its peculiar odour. In the spring the sap of the birch contains much sugar, and forms, when fresh, an agreeable beverage; when fermented, it constitutes what is called birch wine, a liquor employed medicinally in domestic practice for stone and gravel. The young twigs are in general use for besoms. In former days they were thought to be indispensable instruments of education, and, in the school-boy's mind, were ever associated with the Latin grammar. The graceful tree known as the weeping-birch, and which will be suggested to all by the last sentence, is generally regarded as a mere variety of of B. alba; but a few botanists view it as a distinct species, and name it *B. pendula*. *B. nigra*, the black birch of North America, yields a fine-grained valuable timber, and, like the common birch, a saccharine juice. timber, and, like the common birch, a saccharine juice. B. papyracea, the paper birch, is a native of the more northern regions of the same continent; it is remarkable for its tough bark, which is used by the Indians as substitute for paper, and for constructing cances, boxes, and baskets. B. lenta, another American apecies, commonly known as the cherry-birch, yields the timber called mountain mahogany: its bark is one of the sources of the volatile oil called oil of winter green. (See Gualtheria.) The bark of the Asiatic species, B. bhajapaltra, is used in India as paper, and for lining the tubes of hookabs.

BRIULACER. bet-ulai'see. in Bot., the Birch fam.

BETULACEE, bet.u-law-ee-e, in Bot., the Birch fam., a nat. ord. of dicotyledonous plants, in the sub-class Monochlamydeæ. All the species are either trees or shrubs. The flowers are unisexual, the fertile being in one cathin and the barren in another. In each, small scales take the place of a true calyx. The fruit is dry, indehiscent, and one-celled, with a single seed. There are but two geners, Betula and Alnus (which see), and about sixty-five species, almost all natives of the colder regions in the northern hemisphere. Many of these are very valuable either for their timber, or for their astringent, tonic, and febrifugal barks.

Between Decks (Ang.-Sar.), in Mar., signifies the space contained between any two whole decks of

a ship.

BEVEL, or BEVIL, bev'-el, a term used by builders to express a surface sloping from another, at an angle

greater or less than a right angle: thus, if the edge of a thick board or stone, in which the upper or lower surface and the surface of any of the eides are at right angles to each other, be taken off with a plane or any instrument, to present a new surface sloping at an abuse augle to either of the other curface, it is said to be borelled. The name is also given to the instrument with which carpenters and masons work surfaces which are required to slope at the same angle. In its which are required to slope at the same angle. In its simplest form it is a piece of wood, with a thin plate of steel working in a groove at one end, so that it may form any angle with the wood less than two right angles. The steel plate can be fastened with a tight-aning sorew when it has been brought to the required angle.—In Mach., cog-wheels, with bevelled edges, or bevelled gear, as they are termed, are used to transfer the motive power from one direction to another.

BETTRACE, bev-c-raj (Ital. beveraggio), a term spiled to all liquids which are used either to quench the thirst at multate the storage the thirst, stimulate the stomach, or cause a healthy internal action. There are several kinds of beverages; internal action. There are several kinds of beverages; such as cooling, refreshing, tonic, stimulating, &c. In the Middle Ages, beverage, beveragium, or biberagium, was the money given to a workman, over and above his ordinary wages, for the purpose of buying drink. The afternoon and evening potations at colleges were formerly called beverages; it was also a term applied to a treat upon wearing a new suit of clothers; and the

to a treat upon wearing a new suit of clothers; and the drink given by a prisoner upon entering a debtor's gaol was generally called a beverage, or garnish.

BEY. (See Brs.)

BEY. (See Brs.)

BY ENDER, be'-ze ko'-dex (Beza'a Codex), a celebrated manascript of certain books of the New Testament, presented in 1581, by Theodore Beza, to the university of Cambridge; whence it is sometimes also called Codex Cantabriciensis. It is a thick court called Codex Cantabrigiensis. It is a thick quarto volume, and contains the four gospels and the Acts of the Apostles, written in Greek, upon vellum, with a corresponding Latin text on every opposite page. In 1793 a facsimile edition of this codex was published, in two vois folio, under the editorship of Dr. Thomas Kipling, entitled "Codex Theodori Bezæ Cantabrigiansis Evangeliæ, et Apostolorum Acta complectens, quadratis literis Græco-Latinus." The text of this MS, deviates more from the received readings and ms. deviates more from the received readings and from the principal Ms authorities than any other, and in critical weight it ranks the lowest of the four leading Mss. The other three are the Codex Alexandrinus, in the British Museum; the Codex Valicanus, in the Vatican library; and the Codex Regins Parisiensis, in the Imperial Library at Paris. The Beza Ms. is very ancient. Dr. Kipling was of opinion that it must have been written before the 3rd century; but the general opinion now is, that it belongs to the latter end of the 5th or 6th century.—Ref. English Cyclopadia—Arts and Sciences.

BEZEN, be-rānt, in Numis., a gold coin struck by the emperors of Constantinople, deriving its appel-lation from Byzantium, the former name of that city. They were the only kind of gold coin current in Europe for a long period of time. It appears that there were for a long period of time. It appears that there were various kinds of bezants, differing in size, weight, and the quantity of alloy that was added. The common the quantity of alloy that was added. The common beyant of Constantinople was worth about nine shillings; it is often found in the form of a flat dish, with the head of our Saviour upon it. The name was afterwards given to gold coins struck in many European countries, and in England up to the time of Edward III. Silver bezants were also coined at Constantinople, similer in size to those of gold; and silver coins so called are mentioned in old records to have been current in this country in the reigns of Stephen and

current in this country in the reigns of Stephen and John. The only silver coins in the collections of numismatists known by this name are pieces of money struck at Censtantinople, about 1100, and at later periods.—Ref. English Cyclopadia.—Arts and Sciences, BEZANT, in Her., one of the nine roundlets; a circular charge representing a piece of gold, taking its mane from the old Byzantine coin so called. In blazoning armorial bearings in which these charges are found, the metal is not described, as the bezant is always or, or gold, and the name itself is therefore sufficient.

or spotted with a great number of besants. A grees beganty is a cross composed of besents.

beganty is a cross composed of begants.

BEZOAR STONES, be-sor (Persian, po-scalar, untidote to poison), concretions found in the stomachs
of various animals. They are brittle egg-shaped
masses, about the size of a small walnut, and sixmostly dark pive in colour. On being out open,
they present the appearance of a maleus surrounded
by concentric deposits. They occur principally in the
stomachs of oriental goats, deer, and antelopes, said
were formerly looked upon as possessing supermatural
properties. They cured all diseases, and acted as appidotes against every poison: and wore so mach sought properties. They cured all diseases, and acted as against every poison; and were so mach sought after as to be worth ten times their weight in gold. Themest valued of these was obtained from the wild goat of Persia, and was called the Lapis Besons Orientalis. They are found, more or less, in all herbitors, and sometimes occur in the stomachs of persons living much on farinaceous food. They contain litho-fellic and ellagic acids.

and ellagic acids.

Bugavan-Gità, ba'-ga-vad ge-ta' (i.e. Revelations of the Daity), is the name of a very celebrated religiophilosophical didactic poem, dating from about the lst century of the Christian ers, and which is interwoven as an episode in the great Indian epic poem of the Mahābhārata. It comprises a complete system of the religious philosophy of India. The best edition of the text, with a Latin translation, is that of A. W. von Schlegel (Bonn, 1846). There is an English translation of the work by Wilkins (London, 1785), and one by Thomson (1855); and a German translation by Peiper (Leipsic, 1834).—Ref. W. von Humboldt, Ueber die unter dem Numen Bhugavad-Gitá bekannte Bpisode des Mahābhārada. Berlin, 1827.

Mahabharata. Berlin, 1827.

BHANG, bằng, the common Indian name for the seed-capsules and larger leaves of the native hemp

seed-capsules and larger leaves of the native hemp employed for making the celebrated narreotic called Huschisch (which see). The Indian hemp is a species of the genus Cannabis (which see also).

Bi, bi (Lat. bis, twice), a syllable signifying twice or double, and used as a prefix in certain compound names; as biceps, two-headed; bicarbonate, a carbonate with two equivalents of carhonic acid to one of base.

Binanch Acip, bichsi-tik, in Chem., an acid which

BIDASIO ACID, bi-bar-ik, in Chem., an acid which requires two equivalents of a protoxide of a base to form a neutral salt, such as the pyrophosphoric, lactaric, and malic acids.

BIBBU. (See NECTANDEA.)
BIBBU. (See NECTANDEA.)
BIBBU., bi'-bel (Gr. ta biblia, the books), is the name first applied by Chrysostom, in the 4th century, to that collection of sacred writings which is regarded by Christians as the revealed word of God. These writings are divided into two parts,—the Old and the New Testament, the former containing 39 books, the latter 27. The Old Testament only is regarded as sacred by the Jews; but both the Old and New Testament are

held as sacred by Christians. The term testament is a translation of the Latin testamentum of the Vulgate, which, in turn, is a translation of the Greek word sig-theke, a covenant. In the New Testament, the Old Testament writings are designated as the Scripture, the Scriptures, or the Holy Scriptures. About a.p., 180, the term Holy Scriptures is used to include the Gospels; and Irenmus calls the whole collection of the books of the Old and New Testament the divine Scriptures and the Lord's Scriptures. The Old Testament is a name used by St. Paul (2 Cor. iii. 14), being a trans-lation of the Greek expression palais diatheks, old

covenant

The Old Testament,-The Jews divided the books of the Old Testament differently from the present method, so as to make only 22, and thereby to correspond with the number of letters in their alphabet. They divided mismatists known by this name are pieces of money struck at Constantinople, about 1100, and at later periods.—Ref. English Cyclopadia—Arts and Sciences.

BEZANY, in Her., one of the nine roundlets; a circular charge representing a piece of gold, taking its manie from the old Byzantine coin so called. In blazoning armorial bearings in which these charges are found, the metal is not described, as the bezant is are found, the metal is not described, as the bezant is reformed, and the name itself is therefore sufficient.

BEZINYY, or BEZINYZ, be-zdn'-te, in Her., a shield or charge is said to be bezanty when it is strewed three of these books were called the poetical books, or 238

truth; the rest, the five rolls, from being read, on our ain festivals in their synagogues, from manuscript olls. As to the arrangement of the different books, As to the arrangement of the different books was not only differed from the Christians, but are ane sews not only differed from the Christians, but are not even agreed among themselves. The arrangement followed by Protestants generally is that adopted by Martin Luther. The Old Testament was written in Hebrew, with the exception of certain later portions in Chaldee. Little is known of the history of the asored books previous to the time of the Jewish captaints. tivity. According to the command of Moses, "the book of the law" was "put in the side of the ark." It is probable that to the same sanctuary were consigned. as they were produced, the other sacred books. After the completion of the temple, Solomon directed that these books should be removed into it, and, also, that the future compositions of inspired men should be sethe future of mpositions of inspired men should be se-cured in the same place. On the capture of Jorusalem by Mehuchadneszar, and the consequent destruction of the tample, the autographs of the sacred books are apposed to have perished; but, doubtless, nume-rous copies of them existed at that time, some of which were carried by the Jews to Babylon; for we find Daniel (Dan. ix. 2, 11—18), when in captivity, we find Daniel (Dan. 12. 2, 11—13), when in captivity, referring to the law, and also expressly mentioning the predictions of Jeremiah, which he could not have done if he had not seen them. After their return from captivity, we are told that the people requested Ezra to bring forth "the book of the law of Moses, which the Lord had commanded to Israel" (Neh. viii. 1). Accordingly, Ezra is said to have collected as many copies of the sacred writings as he could and from them to have premared a correct edicould, and from them to have prepared a correct edi-From the time of Ezra, the Hebrew canon is generally considered to have been completed, and Josephus affirms that from the time of Artaxerxes down to his own day, no one had dured either to add to, or to take from, or to alter, anything in the sacred books. Great care was taken by the Jews to preserve the ac caracy of the sacred text, and from an early period they were in the habit of numbering the words and even letters of each book. In the Talmud a digest of Jewish laws compiled between the 2nd and 6th centuries, an enumeration of the various readings in different MSS. as well as the words and letters in the Bible, is given. When the Talmud was completed, the Masorites of Tiberias commenced their labours. They were named from masora, tradition, as their annotations were the oral traditions which had been handed down from previous centuries. They are said to have first divided the different books and sections into verses, and to have They marked invented the vowel-points and accents. the number of verses in each book, and the number of words and letters in each verse. They noted the verses where they thought something was forgotten, the words which they believed to be changed, the letters which they thought superfluous, the repetitions of the same verses, the different readings, the words which are redandant or defective, the number of times that the same word is found in the beginning, middle, or end of a verse, the different significations of the same word; such were some of the labours of the Masorites to in-sure the accuracy of the text. As to the value of the labours of the Masorites, biblical critics are much divided in opinion. Some maintain that we are greatly indebted to them for preserving the purity of the sacred text, while others are of opinion that they corrupted the text by substituting for the ancient and true reading of their forefathers, another more favourable to their prejudices, and more opposed to Christianity. general opinion, however, is, that they discharged their duties in a fair and conscientious manner. The oldest versions of the Hebrew Scriptures are the Samaritan Pentateuch, and the Septuagint or Greek translation. The former of these is supposed to date from about the time of the Sabyloniah captivity; for it is not likely that, after that time, on account of the eumity that existed between the two peoples, they would have translated and adopted the books of the Jews. The

to the Hebrew MSS. The Septuagint is said by so to the Hebrew East. Am reprungate when to have been so called from having been approximate Banhedrim, or great council of the Jews, who seventy in number. According to another seventy in the seventy in seventy in number. According to anomer aco Ptolemy Failadelphas, when founding his libra Alexandria, wished to have a copy of the Jewish and applied to Bleazer, the Jewish high-priest at. salem, for proper persons to translate the He Scriptures into Greek. Eleazer accordingly serelders from each of the twelve tribes, seventy-two in all,—whence the work was termed Septement, two all,—whence the work was termed Septement, there is no doubt that the version of the Septement was written at different times, and by different hands. The Pentaleuch was first tanels, and by different name. The Pentacetten was array translated probably in the reign of Ptolemy Lagus, or of his son Philadelphus, and it is allowed to have been done with great fidelity and accuracy. Next in point of excellence is the version of the Proverbs. The Pasims and the Prophets have been vary indifferently executed. The Septuagint version was in great esteem among the Jews in the time of Christ; and very many of the quotations in the New Testament are made of the quotations in the New Testament are made from it. Josephus, too, makes more use of the Sep-tuagint than of the Hebrew text; but at a later period, when the Christians employed the Septuagint, the Jews rejected it. Fragments of three Greek transla-tions of the Old Testament, all of, or mear the 2nd century of the Christian era, are preserved in the Hexaple of Origen, known as those of Aquila, Theo-dotion, and Symmachus, of which the first is the most valuable. The principal of the other early translations are the Nexago or Pachita (literal), from the Hebres are the Syriac or Peshito (literal), from the Hebrew, made about the end of the lat century, and embracing both the Old and New Testaments; the Coptic, from the Septinagint, probably about the 3rd century, and including the New Testament; the Ethiopic, from the Septinagint, probably in the 4th century, including also the New Testament; the Armenian, by Micerob, from the Septinagint, in the beginning of the 5th century; the Italia from the Septinagint, in the beginning of the 5th century; the Italic, from the Septuagint, in the lat or 2nd century, embraced also the New Testament,—but only fragments of it now exist; the Vulgate, which is the great authority with the Roman Catholics, was made from the Hebrow by Jerome, A.D. 300; the Gothic varsion of Ulphilas, of the 4th century, but of which only a part only has come down to us. From a belief in the absolute integrity of the Hebrew text, in consequence absolute integrity of the Hebrew text, in consequence of its supposed preservation from error by the Masora, it was not until the 17th century that any extensive collation was made of the various Hebrew MSS. Among the first to call attention to this subject was Louis Capell, who, in his "Critica Sacra," published at Paris in 1650, called attention to the differences that existed between the Hebrew and Samaritan Pentateuch, and between the Hebrew text and the Septuagint version. At length the necessity of a collation of Hebrew MSS, began to be generally acknowledged; and some attempte to that purpose were made by several subsequent editors of the Hebrew Rible. The several subsequent entires of the heavest hilled. The first great attempt made for that purpose, however, was that of Dr. Kennicott, commenced about 1760. The first volume was published in 1766, the second in 1780. The total number of Codices collated by or for Dr. Kennicott was 694, of which 634 were M88,.43 printed editions, and the remaining 17 were copies of the Talmud, rabbinical works, and collections of various readings. Of these, about 250 M8S, were colleted by Dr. Kennicott himself, and nearly 460 by his coadjutor M. Bruns, of the university of Helmstadt. Of these, some were collated throughout; others only Or these, some were constant inrongnout; others only in a few select passages, from being written in conformity with the same standard. In the opinion of Dr. Kennicott, fifty-one of these MSS, were from 600 to 800 years old, and 174 from 480 to 580. Soon after this, Professor De Rossi, of Parms, published his various readings of the Old Testament in 4 vols. 4to, entitled, "Varion Lectiones Veteris Testamenti ex the time of the Batylenian deptivity; for it is not readings of the Old Testament in 4 vols. 4to, likely that, after that time, on account of the emitty entitled, "Varim Lectiones Veteris Testamenti ex immensa Manuscriptorum editorumque Codicum contranslated and adopted the books of the Jews. The Samaritan Pentsteuch now extent is said to be a version from the earlier Hebrew Samaritan, into the more many of the MSS. collated for Dr. Kennicott, and modern Samaritan, and was made before the time of verified the extracts from them, besides examining numerous additional MSS, and editions examined by generally agreed that it is on the whole much inferior him amounts to about 1,300. Of the immense mass of

various readings which these colletions exhibit, multitudes are insignificant, consisting frequently of the omission or addition of a single letter in a word. omission or addition of a single letter in a word. They serve, however, to show the authenticity and integrity of the sacred text in all that constitutes the proper essence and substance of divine revelation,—its doctrines, moral precepts, and historical relations.

\*\*New Testament.\*\*—The books of the New Testament were originally written in Greek.

They were com-

posed at different times, and for different purposes. They must have for some time circulated singly, but when or by whom they were collected into one uncertain; it seems, however, to have been done by degrees, and that some books were much longer in being received into the canon than others. The first being received into the canon than others. The first evidence that we have of the existence of the collected books is in the Muratorian canon of the West, evidently written about A.D. 170. It is only a fragment, mutilated both at the beginning and the end; commences with a clear reference to St. Mark's gospel, and then passes on to St. Luke as the third, then St. John, the Acts, and the thirteen epistles of St. Paul. The epistle of Jude, the two epistles of John, and the Apocalypse of St. John, are mentioned in the text. The canon of the Peshito forms a remarkable complement to this catalogue. It includes the four gospels and the Acts, fourteen epistles of St. Paul, I John, 1 Peter, and James, omitting Jude, 2 Peter, 2 & 3 John, and the Apocalypse. Up to this point, therefore, 2 Peter is the only book that is not recognized as an apostolical and authoritative writing. (See Smith's Dictionary of the Bible, art. Canon.) The testimony of Eusebius as to the received books of the New Testament in his day is of value. He divides them into two classes, the acknowledged books and the disputed books. In the former class are the four gospels, the Acts of the Apostles, the fourteen epistles of St. Paul, I John, and I Peter; the disputed books he divides into two classes,—those which are generally recognized as authentic, and those which are considered spurious ; the former comprising the epistles of James, Jude, 2 Peter, and 2 & 3 John; the latter the Acts of Paul the Shepherd, the Apocalypse of Peter, and the Apotas Saepherd, the Apacatypse of Feter, and the Apacatypse of John (if not a work of the apostle). Down to the time of the invention of printing, the books of the New Testament were preserved in manuscript; but the vigilance produced by the constant controversies between the Catholics and heretics has served to maintain its general purity. Of the MSS. of the New Testament, upwards of 1,400 are known to scholars, and have been collated without any essential differences being found between them; numerous errors, however, had crept in, from the commutation of letters, transposition of words, seeing and hearing incorrectly, abbreviations, attempts at correcting the text or making it clearer. Modern critics reckon no fewer than 80,000 discrepancies in the various MSS. The oldest MSS. belong to about the 4th century, and are written in the uncial characters; the modern, from the 10th century downwards, are in the cursive characters. The most important MSS, are the Codex Alexandrinus, in the British Museum; the Codex Vaticanus, in the Vatican, at Rome; the Codex Regins Descriptions in the important library at Paris, and the Parisiensis, in the imperial library at Paris; and the Codex Bess, or Cantabrigiensis, in the library of Cambridge university. The first printed edition of the entire New Testament was that of the Complutensian Polyglot, published at the cost of the celebrated Cardinal Ximenes. It was commenced in 1502, and the printing of the book was finished in 1514, but the publication was delayed till 1522. Meanwhile, Erasregionation was delayed till forz. Alesindie, hras-ruas, in 1516, published his first edition of the New Testament. Stephens' first edition appeared at Puris in 1546. The first attempt at a critical edition was made by Bezz; and the first edition was published in 1565. The first truly critical edition is that of Dr. John 1565. The first truly critical edition is that of Dr. John Mill (Oxford, 1707), in which are gathered together 30,000 various readings. Bengel, Wetstein, Grizebach, and Scholz, followed in the same field. Scholz's first volume appeared in 1830, and the second in 1836; he describes no less than 674 different MSS., of which 331 were, for the first time, collated by himself.

English Bible.—It is probable that soon after the introduction of Christianity into this country, portions of the Scriptures were translated into the language of

the people. The earliest version of which we have my account is a translation of the Psalms into the Saxon language, by Aldhelme, or Adhelme, first bishop of Sherborne, about the year 706. A Saxon version of the property of the people was made by Egbert, bishop of Lindau. cuertorne, about the year 706. A Saxon version of the four gespels was made by Egbert, blahop of Lindiafern, who died 721. By some writers, Bede is easie to have made a complete translation of the whole Bible; but this seems doubtful, though he certainly did translate portions of it. King Alfred executed a translation of the Psalms, and Elfric, archbishop of Canterbury, is said to have executed a translation of the Pentauch and cartain other notions and Saxinton. the Pentateuch and certain other portions of Scripture, about 995. The first English translation of the whole Scriptures is supposed to have been made in the 13th ocriptures is supposed to have been made in the 13th century; and towards the end of the 14th century; one John de Trevisa, a native of Cornwall, is said to have made a translation of the entire Bible. This was, at any rate, done by his celebrated contemporary John Wickliffe, rector of Loughborough; in Leicesterahire. With the aid of various assistants, he, about the year 1380, translated the entire Bible from the Latin Vulgate into English. A complete addition of this translation. into English. A complete edition of this translation was published in 1851, at the Oxford University Press, under the editorship of the Rev. Josish Forshell and Sir Frederick Madden. The New Testament from this version had previously been published by John Lewis, a clergyman of Margate, in 1731, and by Mr. Baber, of the British Museum, in 1810. From the time of Wickliffe, the authorities of the English church did all they could to discountenance the circulation of the Scriptures in the language of the people; so that it was not till 1526 that a Bible or Testament was printed in English, and then only at a foreign press. William Tyndale resolved to accomplish this object, and, with this view, he went over to the continent. In 1526 he completed an English translation of the New Tests-In 1526 he ment, which was printed in two editions, one in quarto, the other in duodecimo. Copies of these were secretly conveyed into England, where they were immediately bought up and burned; but this only stimulated Tyndale to greater exertions, and enabled him to carry on his operations. He next proceeded to prepare a version of the Old Testament, and published a translation of the Pentatench and the book of Jonab. He did not, however, issue a complete translation of the Bible. The first English version of the whole Bible is that by Mark Consulation of the Whole School and the the Whole School an that by Marke Coverdale, a friend of Tyndale, and which was printed at Zunch in 1535, and dedicated to Henry VIII. It was favourably received by the court, and it was enjoined that a copy of this translation should be haid in the choir of every parish church in England, for every one to read at his pleasure. Re-prints of the edition were published in 1839 and 1847. prints of the edition were published in 1839 and 1819. The next English Bible, also printed abroad, is known as Metthew's Eible, from Thomas Matthew, the assumed name of the editor (John Rogers), also a friend of Tyndale. It was published in 1837, and the text is that of Tyndale and Coverdale, slightly altered. The Great Bible, or Cranmer's, so called from the preface being written by that prelate, was published in 1539: the text is Coverdale's revised. In the same year ap-peared the Traverner's Bible, by Richard Traverner, the text of which is based upon that of Matthew's Bible. The next important translation was the famous Geneva Bible, which appeared in 1557. During the reign of Mary, several of the more prominent Reformers took refuge in Geneva; among whom were Coverdale, Gilby, and Whittingham. They employed themselves in pre-paring a new edition of the Bible, accompanied with notes. From the strong leaning which it showed to the views of Calvin and Beza, it was long the favourite Bible of the English Puritans and the Scotch Presbyterians. This edition is frequently called the Breeches Bible, on account of the rendering of Genesis ii, 7, "and they sewed fig-tree leaves together, and made themselves breeches." The Bishop's, or Parker's Bible, so called from Matthew Parker, archbishop of Bible, so called from Matthew Farker, archbishop of Canterbury, who, with eight bishops, and several other scholars of reputation, revised the previous transla-tions, and compared them with the originals. This edition appeared in 1868. The Douay Bible, which is the Roman Catholic Version of the Scriptures, is a translation of the Vulgate: the New Testament was published at Rheims in 1882, and the Old Testament at Douay in 1609-10. King James's Bible, the one

still in universal use in this country, was prepared in the reign of James I. At a conference of divines at Hampton Court, in the beginning of 1604, for settling the peace of the Church, the importance of a new lation of the Scriptures was brought prominently constant of the scriptures was rought promently forward. It met with the approval of the king, and arrangements were at once made for carrying out the project. Fifty-four scholars, most distinguished for that kind of learning which this duty required, were scleeted for the work, and finally forty-seven of them undertook it. These were divided into six companies to each of which a certain portion of Scripture was These were divided into six companies, assigned. Each person of a company was to prepare a translation of the whole portion committed to that company, and these several translations were then revised at a general meeting of the company. When a company had in this way agreed upon their version, it was to be transmitted to each of the other companies, so that no part was to be without the sanction of the whole body. Two of the companies sat at West-minster, two at Oxford, and two at Cambridge. The final revision of the whole was conducted in London by two delegates from each of the six companies. These twelve scholars were occupied for nine months in the discharge of their critical duties. The work of translation and revision occupied from 1607 to 1610, and it lation and revision occupied from 1607 to 1610, and it came forth from the press of Robert Barker in 1611. The best evidence of the excellency of this translation is that it has remained in general use to the present time. Many are, indeed, of opinion that the time has now arrived when a new translation is necessary, and that, from our improved knowledge of the originals, and our better understanding of the general principles of translation, a greatly improved version would be the result; but such opinion has not yet met with any general response. There have, however, been many translations of particular books by private individuals. translations of particular books by private individuals.

—Ref. Davidson's Biblical Criticism; Horne's Introduction to the Holy Scriptures; Kitto's Biblical Cyclopedia; Smith's Dictionary of the Bible; Badio's Ecclesiustical Dictionary; Kuight's English Cyclopedia.

BIBLE PROMIBITION.—The prohibition of the Bible to the laity, as held by the Roman Catholic church,

BIBLE PROWIEITION.—The prohibition of the Bible to the laity, as held by the Roman Catholic church, took its rise in the Middle Ages; for there is abundant evidence showing that it did not exist in the early ages of the Church. From the time that Gregory VII., in 1080, declared that the Latiu language should be the language of the Church, the Vulgate became the scripture text; and, consequently, the public use of vernacular copies of the Scriptures ceased. It was not, however, till 1199 that Innocent III., with a view to check the spread of the reformed principles of the Waldenses, prohibited the private possession or reading of the Scriptures without the permission of the Church. Similar prohibitions were issued at Toulouse (1229), at Beziers (1233), and at the synod of Oxford (1335), when the principles of Wickliffe were spreading. Since that time, numerous enactments of the Church have been made on this subject, one of the latest being that of Leo XII. (1824), in which he condemned Bible

BIBLE SOCIETIES are associations formed for circulating copies of the Holy Scriptures. Among the earlier and more important of these associations were the Society for Promoting Christian Knowledge, established in 1698; the Society for sending missionaries to India, established in Denmark 1705; the Society for Promoting Christian Knowledge in the Highlands and Islands of Scotland, formed in Edinburgh 1709; the Moravian Missionary Society, founded in 1732; the Book Society for Promoting Religious Knowledge among the Poor, formed in Londou 1750; and the Naval and Military Bible Society, established in the year 1780. The efforts, however, of all these societies were still far from being equal to the object in view. The first idea of establishing the British and Foreign Bible Society aroas from the great scarcity of Bibles in Walse; and the earliest stops towards its formation was convened; and it was then resolved that a society as some convened; and it was then resolved that a society be formed, under the designation of the British and Foreign Bible Society, the sole object of which shall be to saccurage a wider diffusion of the Holy Scriptures.

gious opinions was also named to carry out the arrange-ments. One of the rules then passed was that the govern-ing body was to consist of 36 laymen, of which 15 were to be churchmen, 15 dissenters, and 6 foreigners resident in or near the metropolis. Every dergyman or dissenting minister who is a member of the society is entitled to attend and vote at any of the meetings of the committee One of the fundamental rules of the society was, that it was to promote the circulation of the Scriptures, without note or comment, both at home and abroad. This subsequently gave rise to several controversies; at one time certain divines of the Church of England insisting that the Prayer-book ought to be given along with the Bible; and, more recently, the circulation of the Apocrypha on the continent, along with the canonical books of Scripture, led to a prolonged controversy. (See APOCRYPHAL CONTROVERST.) The British and Foreign Bible Society soon became the parent of numerous other associations for the circulation of the Holy Scriptures; and at present there are in connection with it about 700 auxiliary societies, a like number of branch societies, and about 2,000 associations. The of branch societies, and about 2,000 associations. The income of the society for the year ending 31st March, 1861, was £250,850; of which £147,164 was derived from subscriptions, donations, legacies, interest, &c.; £82,009 from receipts for Hibles, Testaments, and drawbacks of duty; and £777 from special contributions to the Chimese New Testament and India fund. The total expenditure for that year was £165,462; and the number of Bibles, or portions of Bibles, issued from London during that year was 1,787,398. From the establishment of the society down to 1861, they had issued no fewer than 39,315,226 copies of the Bible, or portions of it. The Society for Promoting Christian Knowledge ranks next to the British and Foreign Bible Society in its efforts to diffuse copies of the Holy Scriptures, although its operations are not confined to that object. The average annual issue of this society is about 150,000 Bibles, 75,000 New Testaments, and 300,000 Common Prayer-books; pesides other books and tracts amounting to about 4,000,000. Like the Bible Society, it issues translations of the Scriptures in foreign languages, and has its agents for promoting the diffusion of the Scriptures abroad. The Edinburgh Bible Society was instituted in 1809. Its average annual income is about £3,000; and it distributes annually about 3,500 Bibles, a large portion of which are in the Gaelic language, and are circulated in the Highlands and islands of Scotland, and in the colonies. In the United States of America the first Bible Society was that established at Philadelphia, in 1808. In 1817 the American Bible Society was formed at New York. It has now about 1,200 auxiliary societies in all parts of the United States, and has an annual income averaging about £80,000; of which rather more than one-half is derived from the sale of Bibles and Testaments; the rest from donations, col-Bibles and Testaments; the rest from donatons, coincident, so, it issues annually upwards of 700,000 Bibles, Testaments, or portions of Scripture. Its head-quarters, the Bible-house, is a large and magnificent building, erected by public subscription. On the continent of Europe, the first foreign Bible society was that formed at Nürnberg, 1804; but the seat of its operations was subsequently transferred to Basel. In 1805 a Bible society was formed in Berlin, which subsequently became merged in the Bible Society of Prussia, established in 1814. This is the most flourishing of the German societies; and it has issued upwards of 2,000,000 copies of the Bible and New Testing of the Bible an tament. In 1813, the Russian Bible Society was establighed in St. Petersburg. It carried on its operations with great activity: but it was suppressed, by order of Nicholas, in 1826. A Protestant Bible society has since been formed for the purpose of supplying Protestants in Bussia with the Holy Scriptures. In Paris, a society was formed in 1818, and still exists, under the name of the French Protestant Bible Society. There are similar societies at Stockholm, Copenhagen, Hamburg, Lubeck, Dresden, Frankfort-am-Main, Stuttgart, &c.

BIBLIA PAUPREUM, paw'-pe-rum (Lat., Bible of the poor).—Before the invention of printing, a copy of the Bible being rare and expensive, the principal subjects of the Old and New Testament were represented in some forty for fifty pictures, with a short explanation of

# Biblical Antiquities

texts of Saripture undermeath each. This was called the "Bhlis Pauperam." It and a similar, but more extended work, called "Spaculum Humans Salva-kimis" (the Mirror of Human Salvation), in a great measure took the place of the Bible in the Middle Ages, and were the chief text-books need by the clergy in addressing the people. Many copies of these works at the control of the copies of these works atill exist.

BUBLICAL ABRIQUITIES, OF BUBLICAL ABCHROLOGY, BIBLICAL ABTRIQUEITES, OF BIBLICAL ABCHROLOGY, wheelvelvels, is the name given to that science which treats of the antiquities, the political constitution, customs, manners, &c., of that people with whom the Boly Surpaura originated, or those to whom it refers.

A knowledge of biblical archwology is indispensably the statement of the surparate accessary to a right understanding of many parts of Scripture. Though this study primarily regards the Scripture. Though this study primarily regards the Jewisli people, yet the manners, customs, &c., of the aeighbouring Semitic nations necessarily form part of it. The principal sources of this knowledge are the Old and New Testaments, the books of Josephus Oldwah antiquities and the wars of the Jews, the writings of Philo, the Talmud and the Rabbinical works, the Greek, Roman, and Arabian writers, ancient monuments, and the works of modern travelworks, the Green, Molnan, and the works of modern travel-lers. For the first work on Hebrew archeology we are indicated to Dr. Thomas Godwyn, whose book, "Moses and Agron, or Civil and Ecclesiastical Rites used by the Ancient Hehrews," appeared at Oxford in 1616. The Germans have particularly distinguished themselves in this department, and among the more recent works that have appeared, are Warnekros, "Entwurf der hebr. Alterthiuner" (Weimar, 1781, 5th edit. 1832); Jahn, "Bibl. Archæologie" (5 vols. Vienns, 1796—1805); Bauer, "Lehrbuch der hebr. Alterthiuner" (Leipsic, 1797); De Wette, "Lehrbuch der hebr. Alterthiuner" (Leipsic, 1797); De Wette, "Lehrbuch der hebr. Jid. Archæologie" (Leipsic, 1814, 2nd edit. 1830); Rosenmiller, "Handbuch der Bibl. Alterthumskunde" (Leipsic, 1823); Winer, "Bibl. Realwörterbuch" (5rd edit. Leipsic, 1847). In English, there are a translation of an abridgment of Jahn's "Biblical Archæology," by Professor Upham (1827); Horne's "Introduction to the Holy Scriptures" (vol. 3); Kitto's "Pictorial Bible;" and the cyclopædias of Kitto, Smith, Eadio, &c. Beblical Certificats is that science which concerns selves in this department, and among the more recent

BIBLICAL CRITICISM is that science which concerns itself with the origin, history, and present state of the original text of Scripture. It comprises a critical knowledge of the languages in which the Scriptures were originally written; the composition, collection, and preservation of the different books; the age, characteristics of the composition of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the different books; the age, characteristics of the control of the c racter, and relationships of the various MSS.; the various readings; and the different philological and instorical means to be employed, in order to determine what the text was as it proceeded from the different permen. Its tendency is not, as is said by some, to weaken or destroy the foundations of Christianity, but, weaken or destroy the foundations of Christianty, but, on the contrary, to strengthen and increase them, by proving the authenticity and genuineness of the Holy Scriptures. It is divided into two kinds, a lower and a higher,—the former merely concerning itself with the words as they stand in the various MSS. or printed the words as they stand in the various also, or printed texts; the latter implying the execuse of the reason in judging of the texts from the context, from the circumstances of the writers, &c. Of these two, the former is the more important and reliable; the latter, as being more open to conjecture, is liable to be abused. Biblical criticism is of comparatively recent origin. It scose, partly at least, in consequence of the controversies in which men became involved on religious subjects, and the necessity of having a correct standard to which to refer. It is utterly impossible for human cantion and diligence to guard against the slightest departure from an author's original words in transcribing, and, consequently, in the course of many centuries, and by being frequently transcribed, numerous different readings had acreen, which it became necessary to decide between, and to weigh the evidence by which they were respectively supported. The authen-tic reading must be determined by authorities, and these authorities are judged of by certain rules. Bibthese authorities are judged of by certain, rules. Bib-lical criticism, then, in its strict and proper sense, comprehends "the sum and substance of that know-

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for before we try to secertain the meaning of an author, we should be careful to see that we have his words.
"There are five sources," says Dr. Davidson, "from which criticism derives all its aid in ascertaining the changes that have been made in the original text of changes that have been made in the original value of the Bible, and replacing authentic readings sachuded by them." These are—1. Ancient versions of the Sacred Scriptures; 2. Parallels, or repeated passages; 3. Quotations; 4. MSS., or written copies; 5. Criticial conjecture. (See Bible.)—Ref. Dr. Davidson's Treaties on Biblical Criticism; Porter's Principles of Textual Criticism.

BIBLICAL INTERPRETATION, OF SACRED HERMENEU-TICS, is the science of teaching or expounding the meaning of the Sacred Scriptures. When the inter-TAUS, is the science of teaching or expounding the meaning of the Sacred Scriptures. When the inter-preter has obtained a pure text by the results of criti-cism, he enters upon another and a more important field,—that of its interpretation. He has now a twofold. duty to perform : first, to associate in his own mind with the terms, the exact idea which the Spirit intended they should symbolize; and, secondly, to excite the same idea in others by means of spoken or written signs. He has to apprehend the meaning of Scripture, and to exhibit it when apprehended, so as to be intelligible. Biblical interpretation is either grammatical or historical,—grammatical, when the meaning of the words, phrases, and sentences, is made out from the usus loquendi and the context; historical, when the meaning is illustrated and confirmed by historical arguments, which serve to evince that no other sense can be put upon the passage, whether regard be had to the nature of the subject or to the genius and manner of the writer. (See HERMENEUTICS.)-Ref. Davidson's Sucred Hermeneutics.

BIBLICISTS, or BIBLE DOCTORS, bib'-li-sists, in Eccl. Hist., was a name given, in the 12th and 13th centuries, to those doctors or learned men that made the Holy Scriptures the chief subject of their study and the text of their lectures. The scholastics, on the other hand, brought all the doctrines of fairh, as well as the principles and precepts of practical religion, under the dominion of philosophy. The scholastics came to be regarded as men of much more ability and ingenuity than the biblicists, and their lectures were flooked to and admired by the young; and, consequently, the Bible doctors were despised. They had few scholars, and had not even a stated time for reading their lectures in any of the famous European universities. The scholastic theology, with its triling subtilities, prevailed in all the universities and colleges of Europe down to the Reformation.

of Europe down to the Reformation.

Bibliography, bib-li-og'-rafe (Gr. biblion, a book, graphe, a writing), may be defined to be the science of books. Anciently, the term bibliographia denoted the writing or transcription of books, and a writer or copyist was termed bibliographos. When the transcribing of books ceased, after the introduction of printing, bibliography came to signify an acquaintance with ancient manuscripts, and a skill in the deciphering of them. The term was not used in its present signification till about the middle of the 18th century, and it was first introduced in France. Bibliography (for which bibliology or bibliograps would be more appro-priate) denotes a knowledge of books, with reference to their constituent parts, their different editions and degrees of rareness, their subjects, authors, classes, &c. There are some who would include under bibliography many other branches of knowledge, indeed, so many as to render it impossible to lay down any limits for the science at all. The sphere and duties of the bibliographer are well and clearly laid down in the following extract. "It is the business of the bibliofollowing extract. "It is the business of the bibliographer, then, to trace the history of books in regard to their forms and other constituents, and consequently. to trace the beginnings and progress of typography. It belongs to him in a particular manner to mark the differences of editions, and to point out that edition of every book which is esteemed the most correct and valuable. In the case of books published anonymously or under feigned names, it is his business to indicate the names of their real authors, in as far as the discoveledge which enables us to discover a wrong reading, to remove it from the text, and to obtain, as nearly as so. All remarkable facts attaching to the history of possible, the original words of the Bible." It is distinct from interpretation, but it forms the basis of it; ness, their having been condemned to the flames, or sup-

gressed, belong to the province of hibliographical in-quiry. Further, every one who engages in any particu-lar line of study must, of course, wish to know the books that have been published in regard to it, or in segard to any particular point that interests his surjosity; and it is the business of the bibliographer to furnish this most useful species of information; in other words, the compilation of catalogues of those books which have appeared in the various branches of knowledge, constitutes another department or bibliography. It is by means of such catalogues that the student comes to know what has been written on every part of learning; that he avoids the hazards of encountering difficulties which have already been cleared; of discussing questions which have already been decided; and of digging in mines of literature which have already been exhausted." (Art. Bibliography, by Macvey Napier, in Encyc. Brit.) The number of bibliographical works that have appeared in our own and other countries are so numerous that we can only afford to notice a few of the principal of them. One of the earliest attempts to present a complete survey of printed literature was made by Conrad Gesner, whose "Bibliotheca Universalis," in I vol. folio, appeared in 1545. The works are arranged according to the names of their authors; but it is limited to works in Greek, Latin, and Hebrew; so that even in his day it could not be said to be universal. The "Bibof Dr. Robert Watt of Glasgow is. liotheca Britannica" with all its imperfections, a most meritorious and use ful work. It was published in 4 vols. 4to (Edinburgh, 1824), in two of which the works are arranged alphabetically, according to their titles, and in the other two according to their authors. It professes to be "a universal catalogue of all the authors with which this country is acquainted; embracing every description of authors, and every branch of knowledge and litera-ture;" and it also gives a large number of works in other languages. The other labourers in this field of literature, however, have generally confined themselves literature, however, have generally confined themselves to books written upon one particular department of knowledge, to works belonging to a particular period, or issuing from a particular press; to anonymous or pseeddonymous works, or to rare or curious books. Of these we may mention Lownde's "Bibliographer's Manual of English Literature," giving an account of rare, curious, and useful books, 4 vols. 8vo, London, 1834 (a new and improved edition of this work is in 1834 (a new and improved edition of this work is a course of publication, under the editorship of Mr. H. G. Bohn); Darling's "Cyclopædia Bibliographica," a G. Hohn); Daring's "Cyclopædia Bibliographica," a library manual of theological and general literature and guide to books (Loudon, 1857-8); "A Critical Dictionary of English Literature and British and American Authors," by S. A. Allibone, 1 vol. 8vo (Phi-ladelphia, 1859); Horne's "Manual of Biblical Bibliography;" Dibdin's "Library Companion," 1824; Epune's "Manuel du Libraire et de l'Amateur des Livres," 4th "Manuel du Libraira et de l'Amateur des Livres," 4th edition, 5 vols. 8vo (Paris, 1842-44) (a uve and enlarged edition of this most valuable and useful work is now in course of publication); Querard's "La France Litteraire," 10 vols. (Paris, 1827-42); De Burc's "Bibliographie Instructive, ou, Traité de la Councissance des Livres rares et singuliers, contenant un Catalogue raisonné de la plus grande partie de ces livres précieux contenant un cutalogue raisonné de la plus grande partie de ces livres précieux raisomó de la plus grande partie de ces livres précieux qui out paru successivement dans la République des Lettres depnis l'invention de l'imprimerie," 7 vols. 8vo (Paris, 1763-8); M. Barbier's "Dictionnaire des Ancoymes et Pseudonymes," 4 vols. 1806-9; Ebert's "Allgemeines bibliographisches Lexikon," 2 vols. (Leipsic, 1821-30) (an English translation of this work has appeared in 4 vols. 8vo, Oxford, 1837); Heinsins' "Allgemeines Bicherlexikon," with supplements, 11 vols. (Leipsic, 1812-52); Ersch's "Handbuch der deutschen Literatur," 2nd edition, 4 vols. (Leipsic, 1822-40) (3rd edition, by Geissler, 1845); Vater's "Literatur der Grammatiken Lexika, und Wörtersammlungen aller Sprachen der Erde," 2nd edition (Berlin, 1847). (Berlin, 1847). BIBLIOMANCY, bib-li-o-man'-ae (Gr. biblion. a book

and manicia, divination), an attempt to gau an insight into futurity by opening the Bible and taking the passage which first offers itself as a means from which guidance or advice may be derived with regard to any vorldly matter about which the diviner may be in doubt Some practised it by going into a place of worship, and 263 taking the first verse of Scripture that might be a after their entrance. The practice of this art after their entrance. The practice of this art was prohibited by some of the councils of the Church in the 5th and 6th centuries. It was introduced into E land about 1070, and was much in vogue with the fam tic enthusiasts that were found among the troopers of Cromwell and the soldiers of the parliament, who must this unsatisfactory method of procuring what the imagined to be the divine approbation or disapprova imagined to be the drivine approbation or disapproval of their plans with reference to the most trifling matters in every-day life. Another method of divining by selecting passages at random from a book, was the Sortes Virgilians, in which a copy of the works of the Latin poet Virgil was used instead of the Bible.—Exf.

Latin poet Virgil was used and the Chambers's Encyclopadia.

Bieliouania, bib-li-o-mai'-mi-d (Gr. biblion, and mania, madness,—book-madness), is a word recently formed from the Greek, to denote a passion for the posterior of the posterior and curious books. The true bibliomatic response and curious books. session of rare and curious books. The true bibliom nise is not guided in his selection of books by their me utility or the value of their contents, but rather by some accidental circumstances connected with them. With him, rarity is what gives its chief value to a book; so that he is ever scarching after books of which only a few copies have been printed, or are known to exist,—early editions, works that have issued from a particular press, printed in a particular manner, on veilum or on large paper,—books bound in a particular on veilum or on large paper,—books bound in a particular way by a particular binder. The editions of the classics by the Elzevirs and the Fouliess are much prized; of the Italian classics, by the Academy della Crusca; the books printed by the Elzevirs and Aldus; there have been a priced by the Elzevirs and Aldus; those bound by Deromo, Bozerian, Lewis, or Rayne.
At the sale of the library of the duke of Roxburghe, in 1812, a copy of the first edition of Buccacio's "Decameron," published by Valdarfer in 1471, was sold for the enormous sum of \$2,280. This led to the formation of the Roxburghe Club, for the printing of rare or hitherto unedited books, the members of which agreed to dine together annually on the anniversary of the sale of the Boccacio. (See ROXBURGUE CLUE.) Dr. Dibdin, in his "Bibliomania; or Book-madness, containing some account of the history, symptoms, and cure of this fatal disease," after giving an account of the eminent book-collectors who have fallen victims to it, describes, as its symptoms, a passion for-1. large-paper copies; 2. uncut copies; 3. illustrated copies; 4. unique copies; 5. vellum copies; 6. first editions; 7. true editions; 8. black-letter editions; and prescribes for its cure—1. reading useful works; 2. reprints of scarce and valuable works; 3. editing our best ancient writers; 4. erecting of public institutions; 5. encouragement of bibliography.

BIBLIOTHECA, bib-li-o-the'-ka (Gr. biblion, and theke,

a repository), properly signifies a library, or reposi-tory of books. In literature, it denotes a treatise giving an account or list of all the writers on a vertain giving an account or list of all the writers on a vertain subject: thus, we have bibliothecas of theology, law, philosophy, &c. There are, likewise, universal bibliothecas, which treat indifferently of all kinds of books; such as Watts's "Bibliotheca Britannica;" also, select bibliothecas, giving an account of none but authors of reputation. (See BIELIOGRAPHY.)

BICAPSULAR, bi-kip'-su-law (Lat. bis, twice, capsula, a capsule), in Bot., having two capsules containing seeds to each flower.

seeds to each flower.

BICAEBURETTED HYDROGEN, bi-kar-bu-rat'-ted, -Olefiant gas. Also a name applied by Faraday to oil

(See CARBON.)

BICE, or BISE, bise (Ang.-Nor.), in Paint,, a pale-blue colour, which is prepared from the Lapie armenius (smalt), and is inclined to be sandy. Bice bears the temant, and a inclined to be sandy. Dice bears are best body of all bright blues used in common work, but requires good and careful grinding, and is, after ultramarine, one of the best of colours. A green, formed by mixing the blue with orpiment, bears the same name, as do also certain compositions of indigo and verditer with chalk.

BICEPS, bi'-seps (Lat. bis, twice, caput, a head), in Anat., is a common name applied to several muscles of the human body, from their having two distinct origins or heads. The principal of these are the biceps flexor cruris and the biceps flexor outlit, the former situated on the hind part of the thigh, the latter on the fore part of the os humeri.

BICKTER, be sailer, a castle and village in the neigh-bourhood of Paris, situated on a hill, and commanding one of the finest prospects of the capital, of the course of the Seine, and of the environs. Louis XIII. erected the castle for the residence of invalids. When Louis XIV. afterwards built the Hôtel Royal des Invalides, Biother became a great hospital, for which it is well adapted by its healthy situation. Water alone was wanting in its ricinity; to obtain which a well was dug in the rock. Bicêtre contains, also, a house of correction (maison de force) for dissolute persons, thieves, swindlers, &c. Since the revolution of 1703, a prison has been erected for those criminals condemned to has been erected for those criminals condemned to the galleys, who are afterwards sent to the public dockyards. Both in the prison and in the house of correction are shops for the grinding of glass, and for other kinds of work in which the prisoners are usefully employed. In the hospital, several hundred beds are allotted to aged patients. None are admitted under the age of 70 years: they are attended with the greatest care, and spend their leisure in the construction of little toys of wood or bone. Bicotre also contains a large hospital for incurable madmen.

Broowers history in Clast the and corner a horn), is

BICORNIS, bi-kort-nis (Lat. bis, and cornu, a horn), is a term sometimes applied in Anat. to the hyoid hone, from its having two processes like horns. Formerly, it was also applied to muscles that had two terminations.

Browsfires, or Browsfirmari, bi-kus'-pids (Lat. bis, and cuspis, a spear), in Anat., is applied to the two first pairs of molars in each jaw, from their having two spearlike tubercles.

BIDAL, or BIDALE, bid'-al (bid and ale), an ancient custom in England, by which friends are invited to drink ale at some poor man's house, and there to contribute something to his relief.

BIDDING PRAYER, bid'-ding. - It was part of the duty of deacons in the early Christian church to act as monitors and directors of the people in the exercise of their public devotions; hence they made use of certain forms or words to give the worshippers or hearers notice when each part of the service began. Bishop Burnet informs us that before the Reformation, when the priest had announced his text, he called on the people to go to their prayers, telling them what they were to pray for. "Ye shall pray," says he, "for the king, for the pope, for the holy Catholic church, &c." When this was done, the people repeated their prayers, counting them upon their beads, in perfect silence, the priest kneeling down likewise and saying his. The rising of the priest was the signal for all to cease their devotions, and the sermon was then proceeded with. The 55th canon of the Church of England enjoins that before all sermons, lectures, and homilies, the preachers and ministers shall move the people to join with them in prayer in a certain form. This form is known as the in prayer in a certain form. in prayer in a certain form. This form is known as the bidding prayer, or bidding of prayer, because in it the preacher is directed to bid the people to pray for certain specified objects. It is now rarely used, the practice of reading a collect or some short prayer before sermon being generally substituted for it. The form "Let us pray," repeated before several prayers in the English Liturgy, is taken from this practice of the early Church.

Bella's Comer, be'-la's (Gr. kome, hair), a comet discovered in the month of February, 1826, by a Prussian named Biels, at Josephstadt, in Bohemia. It accomplishes its elliptic revolution round the sun in rather more than six years and a half. It approaches the earth's orbit more closely than any other cometary body that has yet been observed, passing through the descending node of its own path, at a comparatively short distance from the orbit of the earth, and, in consequence, a collision between the comet and the earth was very much feared at one time, until careful calculations of the comet's orbit were made, and all alarm on the subject shown to be groundless. In 1846 the comet was observed to be separated into two parts, the cometwas observed to be separated into two parts, which travelled in company, at a distance of about 55,000 miles apart. It was not seen in its perihelion assage in 1279, as the circumstances attending its motion were unfavourable for its observation; but this also occurred in 1839, when it passed without notice. When last observed, in 1852, the two fragments into which it had been divided by some inexplicable means, were plainly noticed travelling onwards through 2641

space, at the same relative distance from each other as in 1846.—Ref. English Cyclopadia.—Arts and Beiences; Lardner's Handbook of Astronomy.

BIRMIAL, bi-en'-ni-ûl (Lat. bis, twice, annus, year), in Bot., a term applied to a plant which springs from the seed one year, but does not flower and seed until the second year, when it perishes. The biannial root is commonly enlarged at the close of the first season, by an accumulation of nutriment intended for the support of the plant during its flowering and fariting support of the plant during its flowering and fruiting. The carrot or the turnip is a familiar example of such

BIFFIN, bif'-fin, an apple baked slowly and pressed at. Norfolk is celebrated for it.

flat, Norfolk is celebrated for it.

BIGAMY, big-a-me (Lat. bigamia), in Law, is an offence against the holy state of matrinkuy, and consists of a second marriage, having a former husband or wife still living. Such second marriage is simply or whe sun living. Such second marriage is simply void and a mere nullity, by the ecclesiastical law of England; and yet the legislature has thought it just to make it felony, by reason of its being so great a violation of the public economy and decency of a well-ordered state. By the laws both of ancient and modern Sweden, it is punished with death. With us, the statute 9 Geo. IV. c. 31, makes the offence punishable with penal servitude for seven years, or imprisonment with or without hard labour for not more than two

BIGHT, bile (from the Sax. bygan, to bend), the double part of a rope when it is folded, in contradis-

tinction to the end.

BIGNONIA, big-no'-ni-d (named after the Abbé Bignon, librarian to Louis XIV.), in Bot., the Trumpetflower, the typical gen. of the nat. ord. Bignoniacea. The species are trees or shrubs, usually of a climbing habit, and furnished with tendrils. The leaves are opposite, and generally ternate, pinnate, or conjugate. The flowers are mostly in terminal or axillary panicles. The corollas are trumpet-shaped, and are coloured the coronas are trumper-snaped, and as the variously, white, yellow, orange, purple, or rose. All the species are magnificent plants when in blossom, and have long been cultivated by florists. They are, and have long open cultivated by floriate. They are, with few exceptions, too delicate to withstand our climate, and will only grow freely in stoves. From the leaves of the species B. chica, the Indians of South America obtain a red dye called chica, or carajura, which they use for painting their bodies and their arrows. This chica must not be confounded with the

arrows. This chica must not be confounded with the beverage of the same name. (See Zea.)

BIGNONIACEM, bij-no-ni-ai'-se-e, in Bot., a nat. ord. of dicotyledonous plants, in the sub-class Corolligitora. They are usually trees or shrubs, often twining or climbing; rarely herbs. They flourish in the hotter parts of Asia, Africa, and America, being unknown in Europe except in a cultivated state. The chief interest of these nearts lies it their heartful for the parts lies it their heartful for more therest. of these plants lies in their beautiful trumpet-shaped There are 44 genera and 450 species.

BIGOT, big'-ot, a word applied to a person perversely and obstinately wedded to some practice or opinion, but especially to one who adheres with vehemence to any peculiar notions or extraordinary dogmas upon questions of religion. According to Camden, the use of the word dates from the time when Gisla, daughter of Charles the Foolish, was given in marriage to Rollo, duke of Normandy. When Rollo had received the investiture of the dukedom, he was desired to kiss Charles's foot; but he refused to comply, and on his friends urging him to submit to the ceremony, he replied, in the English tongue, "Ne se, by God!" for which the king and his courtiers derided him, and, repeating his answer with imperfect pronunciation, called him bigot. After this occurrence, the Normans were ordinarily called bigods, or bigots.

BIKH. (See A CONITUM.)

BILDERNY. (See Vaccinium.)
BILBORS, hill-lose, long bars or bolts of iron, with
shackles sliding on them, and a lock at the end, used
on some occasions to confine the feet of prisoners, as handcuffs confine their hands.

Bille, bile (Lut. bilis, said to be derived from bis, twice, and lis, contention, as being the supposed cause of anger and dispute), is a peculiar oily fluid secreted from the blood by the liver. In man it is generally of a yellowish brown colour, and has a bitter taste. According to Berzelius, its constituents

are, in 1,000 parts, 908'4 water, 20 picromel, 3 albumen, 4'1 sods, 6'1 phosphate of lime, 3'4 common salt, and 1 phosphate of sods. The primary cells of the liver separate the bile from the blood of the portal vein, and discharge it into small ducts, which unite to orm larger ones, terminating in the ductus communis sholedochus, whence it is conveyed into the duodenum. It there mixes with the digested food, and performs the important office of fitting it for absorption into the system. The bile thus mixed with the elements of sutrition becomes in part also absorbed; the excrementatious portion passing out of the body, with the their indigestible materials, and imparting their pecuhiar colour to them. When direction is not going on, the bile ascends through the cystic duct to the galibladder, where it is stored for future use. The principal use of the bile is to separate the chyle from the chyme. It also aids in exciting the peristaltic motion of the intestines, and thus causes them to evacuate their contents sooner than they would otherwise do; for, when there is a deficiency of bile, the bowels are in general extremely torpid. When, owing to some functional derangement, the bile is absorbed into the blood and carried through the system, it imparts a ellow tint to the surface of the skin. (See JAUNDICE.) When from any cause the bile is in excess in the blood when from any cause the one is in excess in the blood, or when the liver only imperfectly performs its function of secreting it, the person is said to be bilious. (See Bitlous and Liver.)

Bilge, bilj (Ang.-Sax.), of a ship, the bottom of her floor, or the breadth of the part she rests on when aground. Bilge-water is the water which lodges on her

floor below the level of the well of the pump, and bilgepumps, or burr-pumps, are those that carry it off. A vessel is said to be bilged when her bilge is broken,

and she springs a leak.

BILIARY CALCULI (Lat. calculus, a small stone).

These are sometimes called gall-stones, and are often found in the human gall-bladder in large quantities. They are either semitransparent and crystal-line, or strongly coloured with the bile. They mostly consist of cholesterin deposited on a nucleus of phosphate of lime.

BILIARY DUCTS, bill-yū-re, in Anat., are those ducts or canals which convey the bile from the liver to the

duodemim.

Bitrous, bil'-yas, is applied to any complaint pro-ceeding from the bile. It is often indiscriminately used by patients for any derangement of the digestive organs; but though these often proceed from the bile, they do not always do so. Bilious complaints are indicated by a bitter, nauseous taste in the mouth, a foul tongue, and the appearance of the freces. The best treatment for an ordinary attack of bile is, first, to act upon the bowels by some gentle mercurial purge, a few grains of calomel or blue pill, followed in fourier five hours by a saline draught, so as to freely move Tonics should afterwards be resorted to till the digestive organs have recovered their tone. term bilious is also applied to certain kinds of food which have a tendency to produce bilious affections.

BILIOUS FEVER. (See FEVER.)
BILIOUS TEMPERAMENT. (See TEMPERAMENT.)
BILI, bill (Ang. Sax. bill, a beak), in Orn., the beak or hard horny mouth of a bird, consisting of two mandibles. There is no appearance of lips either in the upper or lower jaw; and, except in the cases of parrots in the fostal state, and some varieties of waterfowl, they are not furnished with proper feeth. In the two exceptions mentioned, the rudiments of teeth have been observed. A portion of the bill at the base of the upper mandible is covered with a membrane, which is called the cere, from the waxy appearance which it presents in some species of birds. It is sometimes covered with feathers, and sometimes it is naked; but it is often found protected by hairs or bristles. The nostrils of a bird are usually situated in the care, but in some cases they are placed so far forward as hardly to be observable. The bills of birds vary in shape according to their habits and the different substances upon which they feed. The bills of birds of prey are very atrong, the upper part being hooked, and very sharp,

dication of courage in a bird, and a sign that it prevaupon living animals. The great variety in the modification of the forms of bills is very interesting, and is treated of under the names of the different epecies of birds; such as crop-bills, spoon-bills, horn-bills, parrets, &c. In the case of those birds which live upon insects, &c. In the case of those birds which are upon the bill is very seldom found hooked, but usually short and slender. The bills of those birds which catch insects and slender. The bills for their deep division, which enables them to gape widely. Birds which live upon seeds have short but powerful bills, with which they can crush their food. Aquatic birds have, as a general rule, broad sensitive bills, which are provided with laming on the inner edge, for the purpose of straining the muddy water, from which they take the principal part of their food. The bills of every species of bird which extracts its food from mud, are modified according to the nature of the food it seeks. Besides the general use of tearing or crushing food, the bills of birds are used when fighting with each other, and slo for the purpose of dressing their plumage, building their nests, and for other functions. Many fishes and reptiles have mouths resembling bills, and the Ornithorhynchus paradoxus is a singular specimen of a quadruped with a bill.

Bill, a kind of hatchet, made in various forms, and used by plumbers, basket-makers, gardeners, and others. When short, it is called a hand-bill; when long, a hedge-bill. The bill is so called from its hooked point, which resembles the beak of a bird. It was formerly used in warfare by the infantry, as a kind of battle-axe. The billmen were principally employed in dispatching the wounded when the enemy

was routed.

BILL (from Lat. bulla, a seal), a term originally applied to any scaled letter or document, but now used to denote any formal written statement of any kind. (See the articles which follow for the particular tech-

nical uses of the word BILL.)

BILL, in criminal cases, is an indictment or written accusation of one or more persons, of a crime or misdemeanour preferred to or presented upon oath by a grand jury. When this jury have heard the evidence, if they think it an accusation groundless, or not suffi-ciently supported by the witnesses called before them. they used formerly to indoze on the back of the bill or indictment Ignoramus, or we know nothing of it; intimating that though the facts might possibly be true, that truth did not appear to them; but now they assert in English, more absolutely, "not a true bill," or (which is the better way) "not found;" and then the bill is said to be thrown out, and the party is discharged without further answer (and, by the 8 & 9 Vict. c. 114, without fees); but a fresh bill may afterwards be preferred to a subsequent grand jury, but not at the same assizes or sessions, for the same offence. If they are satisfied of the truth of the accusation, they then indorse upon it, "a true bill" (anciently they then indorse upon it, "a true bill" (anciently billa rera). The indictment is then said to be found, and the party stands indicted. To find a bill, there must, at least, twelve of the jury agree. The indictment, when so found (or not found, as the case may be), is then returned, or publicly delivered into couri, and the finding of the jury openly proclaimed, and the accused person is called un to along the least to the land of th accused person is called up to plead to it. If he plead guilty, sentence is at once passed; but if he plead not guilty, the case is tried by the petit jury; and if they acquit him, he is discharged, but otherwise he receives the sentence of the court

BILL IN CHANCERY was formerly the first commencement of a sait in the court of Chancery, which is analogous to an action in the common-law courts. There are now two other modes of instituting a suit in chancery, viz., by claim and summons, according to the matters brought before the court. The bill is in the style of a petition to the lord chancellor. This is in the nature of a declaration at common law, or a libel and allegation in the spiritual courts, setting forth the circumstances of the case at length, as some fraud, trust, or hardship, and praying relief; and if the object which they feed. The bills of birds of prey are very of the bill be to stay waste or other injury, an injunction, the upper part being hooked, and very sharp, then the same to be able to tear and cut to pieces the flesh of the animals upon which they seize. A strong short others which are merely ancillary to an action at hw, bill, with the edges sharp and notched, is the usual in-

but only evidence to be used in a court of common law but only evidence to be used in a court of common haw in support or defence of an action brought or to be brought. These are called bills for discovery. If such a bill be filed by the defendant in the action, it further prays an injunction to stay proceedings at law in the mean time. As, however, the common-lew courts have now the power to order parties to be examined on in-terrogatories, and to stay proceedings in the mean time, a bill for discovery is not resorted to except in some very appeal cases.

some very special cases.
BILL IN PARLIAMENT.

BILL IN PARLIAMENT. (See STATUTE.)
BILL OF ADVENTURE. (See ADVENTURE, BILL OF.)
BILL OF ATTAINDER is an act of parliament to
attaint particular persons of treason or felony; but,
although in former times such a process may have been resorted to, our present laws would scarcely permit such an innovation. It was also in the nature of a writ after judgment against a jury of twelve men that had given false judgment in any court of record. But the practice of setting aside verdicts upon motion, and granting new trials, has so superseded the use of it, that there is hardly any instance of an attaint for this cause later than the 16th century.

BILL OF COSTS. (See COSTS.)

BILL OF EXCEPTIONS.—If a judge of a superior court of common law, either in his directions or decisions, misstates the law by ignorance, inadvertence, or design, the counsel on either side may require him publicly to seal a bill of exceptions, stating the point wherein he is supposed to err; and this he is obliged to seal by the Statute of Westminster the 2nd (13 Edw. 1. c. 31), or if he refuse so to do, the party may have a compulsory writ against him commanding him to seal it, if the fact alleged be troly stated; and if he return that the fact is untruly stated, when the case is other-wise, an action will be against him for making a false This bill of exceptions is in the nature of an appeal, examinable, not in the court out of which the record issues for the trial at nisi prius, but in the next immediate superior court, upon a writ of error, after judgment given in the court below. Bills of exceptions are not at present so much in use as formerly, since the more frequent extension of the discretionary powers of the court in granting a new trial, which is now very commonly had for the misdirection of the judge at nisi prius.

BILL OF EXCHANGE is a security originally invented among merchants in different countries for the more easy remittance of money from one to the other, and has since spread itself into almost all pecuniary transactions. It may be defined as "an open letter of request from one man to another, desiring him to pay a sum named therein to himself, or to a third person on his account;" and by this method, a man at the most distant part of the world may have money remitted most distant part of the world may have money remitted to him from any trading country. If A. lives in Jamaica, and owes B., who lives in England, £1,000, and C. be going from England to Jamaica, he may pay B. the £1,000, and take a bill of exchange drawn by B. in Hagland upon A. in Jamaica, and receive it when he comes thither. Thus does B. receive his debt, at any distance of place, by transferring it to C., who carries over the money in paper credit, without danger of nobbery or loss. In common speech, such a bill is frequently called a draft; but a bill of exchange is the more legal, as well as mercantile, expression. These bills are either foreign or inland,—foreign, when drawn by a person residing abroad, or in Scotland or Ireland, upon his correspondent in England, or vice versa; and inland, when both the drawer and drawee reside in England. If a bill be made payable (as is most usually the case) to order, that is, either to A. B., or his order, or merely to the order of A. B. (which is in all respects equivalent), it is said to be negotiable, a term applied, in law, to any instrument, the right of action on which is, by exception from the common rule, freely assignable from man to man; and the payee may, by indorsement, or writing his name in dorse, or on the back; sasign over his interest in the bill. Such indorse-ment may either be in blank or in full. In the former case, the payee simply writes his own name; in the latter, he also defines the intended assigner, as the person to receive payment, and to him, in either case, he delivers over or sends the instrument so indorsed; and such assignee (or indorses, as he is called) may in-

dorse in like manner to another; and so on, in infinitum. If the bill be payable (as it may be) simply to a person named, and not to order, it is not negotiable; and, on the other hand, if made payable to bearer (as is always the case in that species called a cheque on a banker), it is negotiable without any indorsement, and by mere delivery; and the case is the same where a bill, payable to order, is indersed in blank by the payee; for it may afterwards be transferred, either by a new init may afterwards be transferred, either by a new in-dorsement and delivery, or by simply delivering it to the intended transferee. A bill of exchange is due (or at maturity) on the third duy of grace after the time expressed for payment on the face of it, unless it be drawn payable on demand. If the third day of grace following Seader Christope day Good Friday fall upon a Sunday, Christmas-day, Good Friday, or a day of public fast or thanksgiving, it becomes due the day before. At any time before it becomes due, the holder may present it to the drawer for his accept-ance, which must, in case of an inland bill, be by writing on the instrument; but, in case of a foreign one, it may be either written or verbal. After acceptance, if the bill be not paid on arriving at ma-turity, the holder has a right of action against any or either of the parties whose names appear thereon of the parties whose names appear thereon antecedently to his; but such right is subject to the condition that he shall have presented it to the drawee on the day it became due, and that he give reasonable notice of its dishonour or non-payment; that is, under ordinary circumstances, notice on the following day, or, to persons not residing in the same town, by the post of that day, or in case of a foreign bill, by the next ordinary post or conveyance, to all the parties whom he intends to charge, or at least to him whose name was last placed on the bill, in order that the latter may give the like notice to the party next before him; and so in succession, each party being allowed in turn a similar time for the purpose. The original payee can only resort to the drawer. If the drawee refuse acceptance,-a refusal which the law will imply, unless he accepts immediately on presentment, or within twentyfour hours after the bill is left with him for the purpose, -the drawer and indorsers are liable to make immediate payment, though the bill has not arrived at maturity; but notice of the non-acceptance must be given, as before stated in reference to the case of nonpayment. After this notice, the holder may hold it, and present it for payment when it comes to maturity, without waiving his right of recourse against the other parties. The bill need not, however, be presented for acceptance, unless it be drawn payable at a specified time after sight or after demand. Where the ceremony of presentment for acceptance is (except in the cases last mentioned) outsted, the bill must be presented for payment; and the same law of proceeding against the drawer and indorsers will then apply, as already stated in reference to the case where an accepted bill is presented for payment. The most common form of a bill of exchange is for the drawer to address it to the intended payer or accepter, who accepts it at once. It then becomes subject to all the incidents above mentioned in the case of an accepted bill. (For the law as to protest, and acceptance supra protest, for honour of the drawer, or any indorser, and other mat-ters connected with bills of exchange, consult the following writers on this subject: — Chitty, Bayley, Bylea.)

BILL OF HEALTH is a certificate or instrument granted by a consul, or other competent authority, to the master of a ship at the time of her clearing out from any port or place suspected of being liable to in-fections disorders, declaring the state of health in the place at that time. A clean bill imports that at the time the ship sailed, no infectious disorder was known to exist; a suspected, or touched bill, denotes that there were rumours of an infectious disorder, but that it had not yet actually appeared; a foul bill, or the absence of clean bills, imports that the place was infected when the vessel sailed. If the ship brings a clean bill of health, the passengers and goods are not subject to any quarantine; but, if a foul or suspected bill, they are subject to quarantines of different duration, according as the plague is known or only suspected to have existed in the country at the ship's departure. (See QUARANTINE.)-Ref. McCulloch's Commercial Dictionary.

#### Bill of Indemnity

Bill-Chamber

BILL (or Acr) OF INDEMNITY.—These are acts of parliament conscionally passed to indemnify persons who have, through forgethinness, inadvertence, or other causes, done or omitted to do certain acts whereby they have incurred penalties.

BILL OF INDICTMENT. (See INDICTMENT.)
BILL OF LADING is an acknowledgment signed by
the master of a ship, and given to a merchant or consigner, containing an account of the goods which the master has received on board from him, with a promise the deliver them at an intended place, on payment of freight. Each bill of lading must be treble,—one for the merchant who loads the goods, another to be sent to the energine, and the third to remain with the master of the ship. A bill of lading is only used when the goods sent are only part of the cargo; for, when a merchant-loads the whole of the vessel on his own personal account, the instrument passed between him and the master of the ship is called a charter-party (which

BILL OF RIGHTS was an important statute, the second of the first year of William & Mary, so called as being declaratory of the rights of British subjects.

It was delivered by the Lords and Commons to the prince and 'princess of Orange, February 13, 1688, before they were raised to the throne. The rights declared are as follows:—1. That the pretended power of dispensing with laws, by regal authority, without consent of parliament, is illegal. 2. That the pretonded power of dispensing with laws, or the execution of laws, by regal authority, as it had been then of late assumed and exercised, is illegal. 3. That the commission for creeting the Court of Commissioners for Recleviastical Causes, and all other commissions and courts of like nature, are illegal and pernicions. 4 That levying money for or to the use of the crown, by pretence of prerogative, without grant of parliament, for longer time or in other manner than the same is or shall be granted, is illegal. 5. That it is the right of the subject to petition the king; and all commitments and prosecutions for such petitioning are illegal.

8. That the raising or keeping a standing army within the kingdom in time of peace, unless it be with consent of parliament, is against law. 7. That the subjects which are Protestants may have arms for their defence suitable to their conditions, and as allowed by law. 8. That elections of members of parliament ought to be free. 9. That the freedom of speech, and debates or proceedings in parliament, ought not to be impeached or questioned. 10. That excessive bail ought not to be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted. 11. That jurors ought to be duly impanelled and returned; and jurors which to be duly impanelled and returned; and jurors which pass upon men in trials for high treason ought to be freeholders. (This provision respecting the qualification of jurors in cases of treason is repealed by the Jury Act, 6 Geo. IV. o. 50.) 12. That all grants and promises of fines and forfeitures of particular persons before conviction are illegal and void. 13. And that, for redress of all grievances, and for the amending, strengthening and processing of the level realizable. strengthening, and preserving of the laws, parliaments ought to be held frequently. It concludes in these remarkable words:—"And they do claim, demand, remarkable words:— And they do chain, demand, and insist upon all and singular the premises, as their undoubted rights and liberties." And the act of parliament itself recognizes all and singular the rights and liberties asserted and claimed in the said declaration, to be the "true, ancient, and indubitable rights of the people of this kingdom." These liberties were of the people of this kingdom." These liberties were again asserted at the commencement of the 18th century, in the Act of Settlement, 12 & 13 Will. III. c. 2, whereby the crown was limited to her present majesty's illustrious house : and some new provisions were added. at the same fortunate era, for better securing our religion, laws, and liberties, which the statute declares to be the "birthright of the people of England, according to the ancient doctrine of the common law." Some of these new provisions have been since repealed. The principal which are now in force may be shortly stated thus:—The possessor of the crown shall join in communion with the Church of England, as by law established, and, if not a nasive of England, this nation

judges shall not be removed whilst they properly & mean themselves, except upon the address of both houses of perliament, and their scharles shall be seen teined and established (and by 1 Geo. III., o. 25, 35). commissions are continued, notwithstanding the de-miss of the crown); that no pardon under the great seal shall be pleadable to an impeachment by the Commons in parliament.

BILL OF SALE is a deed under seal, which passes the right and property in chattels from one to another; and, being under seal, and therefore a solemn contract, the seller cannot, as he might in the case of a mere parol contract, show that it was made without good or valuable consideration, and that, therefore, in law, the preperty did not pass, and no action can be maintained to recover it. By the statute 13 Eliz. c. 5, every great or gift of chattels (as well as lands) with intent to defraud guit of chattels (as well as lands) with intent to defraud oreditors or others, shall be void as against the persons to whom such frand would be prejudicisl, and all persons partakers in, or privy to, such frandulent grants, shall forfeit the whole value of the goods, one moistly to the queen, and the other to the party aggreered, and also, on conviction, shall suffer imprisonment for half a year. The retaining possession by the original own year. The retaining possession by the original owner contrary to the purport of his assignment, is one of the principal badges of fraud, entitling the creditors of the original owner to impeach the transaction. And now by the 17 & 18 Vict. c. 36, it is enacted that every ball of sale shall be deemed fraudulent and void as agcreditors, where the person executing the deed remains creditors, where the person executing the deed remains in possession of the property, unless the bill of sale, or a copy of it, and every schedule thereto, with an affidavit of its execution, in which the address and addition or occupation of the assignor, and of every witness to its execution, with the actual day of its execution, be set forth and filed in the court of Queen's Bench within twenty-one days from the time of its

BILL OF VICTUALLING. (See VICTUALLING-BILL.)
BILLARDIERA, bil-lar-di-er-a (from the French botanist Labillardière), in Bot., a gen. of plants belonging to the nat. ord. Pittosporacca. The species are elimbing shrubs, natives of Australia and Tasmania, where they are commonly known as apple-berries. They have are commonly known as apple-berries. They have simple alternate evergreen leaves, and axillary pendulous flowers. The fruits are soft berries, which, when ripe, are of a bluish colour, and have a pleasant sub-acid taste. A few species are cultivated in the conservatories of this country, for the sake of their handsome flowers.

BILLBERGIA, bil-ber'-ji-a (from the Swedish botanist Billberg), in Bot., a gen. of plants belonging to the nat. ord. Bromeliacea. The species are all natives of South America. From the roots of B. tinctoria the

of SOURI America. From the roots of the source of the purchase and sale of bills of exchange and promiseory notes. They sell bills for those drawing on foreign countries, and buy bills for those remitting to them. It is their business to know the state of the exchange, and the circumstances that are likely to elevate or depress it. The rate of exchange on bills is, as in other things, regulated by the law of supply and demand; for when there is a scarcity of bills drawn upon a certain country, their value will rise; and when there is a superabundance, it will necessarily fall. When the a superacumoance, it will necessarily isll. When the value of the exports to any country in a given period is equal to the value of the imports from the same country in the same period, the bills drawn in each country upon the other will be equal in amount, and, consequently, will be about par. Bill-brokers are distinct from bill-discounters,—those who discount bills that have some time to run before they become due. (See BROKERS.)

BILL-CHAMPER, a department of the Court of Session BILL-CHAMBER, adepartment of the Court or Session in Sectiand, in which suramary potitions and applications, and other branches of business requiring unusual dispatch, are disposed of. The last-appointed lord-ordinary officiates in the Bill-Chamber during session, and all the judges, with the exception of the lord-president and lord-justice elerk, officiate in rotation during vacation. In general, wheater ages requiring tion during vacation. In general, missass requiring the immediate interposition of judicial authority, such as suspensions of decrees or of diligence, and suspensions of suspensions of decrees or of diligence, and suspensions of decrees or of decree or of decrees or of decrees or of decree or of decrees or of decrees or of decree or of decrees or of decrees or of decree or of decrees or of decree or of dec shall not be obliged to engage in war, to defend any the immediate interposition of judicial authority, such dominions which do not belong to the crown of as suspensions of decrees or of diligence, and suspensions, without the consent of parliament; that the sions and interdicts of threatened wrongs, are pro-

cooded with, in the first instance, in the Bill-Chamber. An interim interdict, by which the proceeding com-plained of is arrested till it can be inquired into and An interim interdict, by which the proceeding complained of is arrested till it can be inquired into and disquesed by both parties, is granted on the applicant making out an explain case of injury, and becoming responsible for any injury which may be occasioned by the interdict, should it ultimately be recalled. In general, he has also to find caution for the expenses of the process. The greater number of the proceedings are associated by the judge as a matter of form, on the clarks finding that the papers presented ask the usual powers in the usual manner. If a question of law is involved in the application, the point is discussed as in an ordinary action. Matters of bankruptcy or sequestration are also adjudicated on in this department. (See Essenon, Courr or.)

Britart, bit let (Fr. billot, a block, or small log of wood).—In Arch., when any moulding, either square or circular in form, but more generally the latter, is

or circular in form, but more generally the latter, is divided into short sections, and every other piece then out away, the remaining projections, which resemble short blocks of wood, are called billets. It is peculiar to Reman architecture. When several rows of mouldings one above another are ornamented in this manner, the billets are placed interchangeably; that is to say, the hollowed spaces in one line of moulding come by the side of the projections in the moulding next to it;

Biller, bil-lai (Fr. billet, a letter), in Her., a charge resembling a brick or letter in its oblong rectangular shape. By English heralds it is considered to repre-sent a letter; and hence the derivation here given; but foreign heralds are inclined to consider it as repre-

senting a brick or tile.

BILLETING, bill-le-ting (Fr. billet, a letter), in Mil., the neans by which food and lodging are provided for soldiers when on the march, or during a temporary stay in any town in which there are no barracks for their accommodation. Prior to the passing of the Mutiny Act in 1869, private persons were compelled to receive soldiers in their dwellings without any recress at the hands of the civil authorities, as the men or their officers might demand; but after this, an equitable distribution by the authorities of the place was enjoined in all cases; and since 1745 it has only been compulsory on inn-keepers of all classes, persons keeping beer and cider-Reopers of all classes, persons keeping over an cuer-shops, and those licensed to sell wine and spirits, or let horses for hire. Remuneration for food and lodging is given at the rate of 10d, per day for each man, and 9d, for the keep of a horse. The innkeeper is bound to give the soldier the means of cleaning his arms and outrements, and to provide him with one hot meal is the course of each day. It is the duty of the officers to visit daily every house where the soldiers are quartered, to see that this is not evaded by any private arrangement with the soldier, or purposed neglect. When it is found necessary to provide accommodation for troops in a town for a short time, the officer in command communicates with the mayor of the town or chief magistrate of the district, mentioning the number of men for whom food and lodging will be required. The magistrate then distributes the men as equally as possible among the various innkeepers in the town or district, and causes letters, or billets, to be prepared, assigning a certain number to each public-house. Non-commissioned officers are generally sent on in advance, who receive these billets and distribute them to the

troops as they arrive.

BILLIARDS, bill-yards (Fr. billard, the stick or made with which the ball is struck), a game played with yory balls upon a rectangular table, usually made of absteand covered with the green cloth. The size of a billiard table varies; but it is generally about 12 feet long and 6 feet broad, and is surrounded with generally made of indis-rubber, in order to keep the balls on the table and make them rebound. Two of the ivery balls employed are white, and one red. At each porner of the table, and in the centre of each of the longer sides, is an opening provided with a pocket or heard-net; and the object of the player, in an ordinary game, is either to make a cannon—that is, to hit the other white-sid and the red with his own white all .-- or to make a hazard-namely, to place his own hall into a pocket, after striking the red or white ball,— or to play so as to thrust the red or white ball into a 268

pocket. The former is called a losing hazard, and the latter a winning hazard. The stick or one with which the balls are struck is a straight wooden rod tipped with leather, between five and six feet long, and tapering towards its smaller extremity. The balls are sometimes struck with a mace, a straight she dee stick with a broad head attached to it: the mace, however, is achdom used. except by ladies and beginners. For a long period it except by ladies and beginners. For a long period it was the only instrument used in England; but gradually it was superseded by the cue, which is played over the left hand, on a "bridge" made by the fingers and thumb. The lesthern point of the cue is usually chalked before playing, in order to prevent its slipping. Before commencing to play, a fine chalk-line is drawn across the lower end of the table, nearly two feet distant from it. From the centre of this line, a semicircle is drawn, about one foot and a half in diameter, with the convex side towards the lower end of the table. The space included between the line and the semicircle is called the baulk, from which the first player always begus. In the centre of the table, at the high end, about a foot from the enshion, is a mark, upon which the red bull is placed. The game, which upon which the red ball is placed. The game, which is generally scored by a non-player, or marker, was originally 21; but it is often played to 50, 63, 83, 100, or 1,000. It can be played by two, three, four, or more persons, and there are many varieties of the game. According to Heyle, the different games played upon a billiard-table are as follows:—The White Winning game, which is played with two white balls, and is scored independently of forfeitures, from winning hazards only 12 scores the game when two persons are playing, and 15 when four play. The White Losing game, which is the reverse of the former, is scored from losing and double, or winning and losing hazards: 12 is the score in this also. The White Winning and 12 is the score in this also. The White Winning and Losing game is a combination of the two preceding : all balls put in by striking the adversary's ball first reckon towards the game. Choice of Balls.—In this game the player chooses his ball each time. The Bricole game.

Here the player must first make his ball strike a cushion, whence it must rebound so as to hit that of his cushiou, whence it must rebound so as to hit that of his adversary. The Bar-hole game, so called when the player is debarred from playing at one pecket or hole. One-hole is a game in which only the balls which go into one pocket are counted. Hazards, a game resembling Pool, which depends entirely on the making of hazards, a fixed sum being paid to the player for each hazard. The Doublet same is played with two balls, usually against the white winning game. No hazard is scored in it, ruless made by a rebound from the pushion. The Companying cappa where the safety. hazard is scored in it, railess made by a rebound from the cushion. The Commanding game, where the adversary fixes upon the ball which the player has to strike, is generally played by a superior player against the ordinary game. The Limited game is played by drawing a line across the table, and if the player's ball passes beyond it, he pays foreit. The Red Winning and Losing Carambole game, which is the game most commonly played, is reckoned from winning and losing hazards and caramboles or cannons. The cannons and white hazards score two. cannons. The cannons and white hazards score two, and the red hazards score three. The Winning Carambole, or Red game, is played with winning hazards and cannons only. The Losing Carambole, nearly the reverse of the winning, is played with cannons and losing or double hazards. The Russian Carambole is a variety of the same game. The Cardine or Carline game is played with five balls,—two white, one red, and another blue, and the Caroline ball, which is yellow. The red ball is placed on its usual spot, the Caroline ball in the centre of the table, and the blue ball at the lower end. centre of the table, and the blue ball at the lower end. The striking-place is at the upper end, in a line with the three balls. The yellow ball, when pocketed in the Caroline or middle pocket, scores six, the red hazard counts three, and the blue two. The game score is forty-two. The four game consists of two partners on each side at any of the ordinary games. They play is succession after every winning hazard lost. The cushion game consists in the striker playing his ball from the top of the baulk-cushion, instead of following his stroke upon the table. Fortification Billiards is a his stroke upon the table. Fortification Billiards is a complicated game, in which ten little wooden forts, made in the form of castles, and arches, with bells suspended in them are used. In the game of billiards, as generally played, one is scored for a miss, two for a

## Billon

white hasard, two for a cannon, three for a red hasard, and three for running a "coup," or going into a pocket without touching either of the other balls. One of the was pour consuming maner of the course cause. One of the white halls has a spot upon it, and is called the spot ball; the other is called the plain. The game of billiards appears to have had its origin in France or Italy, but there seems to be considerable doubt as to the country where it was first invented. It was, however, occurry where it was mere invenied. At was, nowever, introduced into this country from France, and for two centuries was played with two balls only. When the third, or red ball, was first introduced into the game from France, the sole object of the players was the red winning hazard,—the pocketing of the red ball. At the processed day winning and loaine hazards off the red hall present day winning and losing hazards off the red ball are the favourite strokes of the most scientific players in this country. In France the principal game of billiards is played upon a table which has no pockets, and the score is made entirely with cannons. The French game can be played upon ordinary English tables, and then cannons only are reckoned in the score. The rules of billiards are very exact, and are generally hung up in a frame where the game is played. The game of Pool is played upon a billiard-table, and differs entirely from the ordinary game of billiards. In Pool, winning hazards are the only strokes made; but, in order to master the game thoroughly, it requires a correct eye, a steady hand, and a cool head. Any number of persons can play at Pool. Each player receives a different-coloured ball from the marker, and plays in regular succession. Brery time a ball is put into a pocket by a winning hazard, the owner of the ball pays a fixed price to the player and loses a "life." At startuge, all players have those observed on the player and loses as "life." a fixed price to the player and loses a "lite. At shaling, all players have three chances, or "lives," and when these are gone, he retires from the game. The player or players who keep their balls longest upon the table win the game. When two players only play at this game, it is called Single Pool. Billiard-tables were formerly made exclusively of wood—they are now universally made of slate; and a good billiard-table, well fitted-up, costs between £70 and £80. Amongst the best players in England of late years may be men-tioned the Earl of Eglinton, Colonel Munday, and Mr. Roberts. (Ref. for rules and directions, Hoyle's

Billon, bil'-lon (Fr.), in Numis., is a composition of precious and base metal, an alloy of copper with gold or silver, in which mixture the copper predominates. In France, billon of silver was any sort of silver below the standard of ten pennies fine, and billon of gold beneath the standard of twenty-two carats fine. Billon, or black money, was, by command of the kings of England, coined in the mints of the English dominions in France, for the use of their French subjects, and was in common use from about the 13th century. was in common use from about the 13th century, Henry VIII, caused base money to be coined, that it might circulate in France. Both Henry VIII, and Elizabeth had base money, similar to billon, coined for circulation in Ireland. In North Germany the grozehen, which corresponds nearly to the English penny, is of billon, and is not unlike an English silver fourpenny lices. piece. The advantage of its use is questionable; for though it avoids the extreme weight and bulkiness of coin formed entirely of copper, yet it is ugly, dirty, and easily counterfeited.

BILLS OF MORTALITY are accounts of the number of deaths that have taken place within a particular district in a specified time, classified according to their ages, the diseases of which they died, &c. They were first compiled in London during the great plague of 1593, and ten years afterwards they began to be returned weekly, and have been continued down to the present time. Tables of this description, when their accuracy can be depended upon, are of the utmost importance as showing the progress of a people in civilization and as showing the progress as basis for many important cal-culations. The Northampton and the Carlisle tables have long served as the chief basis on which annuities, life assurances, and other calculations relating to the life assurances, and other calculations relating to the duration of human life, have been founded. By 6 & 7 Will. IV. c. 86, provision was made for a complete system of registration of births, deaths, and marriages throughout England and Wales; and the same was extended to Scotland by 17 & 18 Vict. c. 80, (See REGISTRATION.)

# Biography

the first order of Mammalia, reckoning in its numb the human species only. The term has reference than in an animal sense alone, and alludes to the tw hands which form the terminations of the fore limit arms. No other animal except man possesses too hands. The monkey tribes are distinguished by havin thumbs at each of the four extremities of their limits and are consequently called quadrumona, or four hands animals. Man, as an intellectual being, is considered so far above the brute creation, that the term bissens is not inserted in many zoological systems; but as the name only relates to the bodily structure of the human

being, it is very generally used by zoologists.

BINARY ARITHMETIC, bi-na-re, a kind of notation in which only unity, or l and 0, is used. It was the invention of Leibnitz, who proves it to be an expeditions method of discovering the properties of numbers and of constructing tables. M. Dangecourt, in the History of the Royal Academy of Sciences, gives a specimen of its operation in arithmetical progressionals, in which he shows that, as in binary arithmetic only two characters are used, the laws of progression may be more easily discovered by it than by common arithmetic. In binary arithmetic, all the characters used are 0 and 1, and the cipher multiplies everything used are 0 and 1, and the choice matthines everything by two, as in the ordinary arithmetic is done by 10. Thus, 1 is 1; 10, 2; 11, 3; 100, 4; 101, 5; 110, 6; 111, 7; 1,000, 8; 1,001, 9; 1,010, 10. It is remarkable that this system is identical with that, used 4,000 years ago by the Chinese, and left as an enigma by Fo-Hi, the founder of their empire.

(See CHEMICAL NOMEN-BINARY COMPOUND. ATURE.)

BINARY MEASURE, in Mus., is a measure which is heaten equally, or where the time of rising is equal to that of falling. It is usually called common time.

BINARY NUMBER is that which is composed of two

BINARY THEORY, in Chem. (See SALTS.)

RINDWRED. (See CONVOLVULUS.)
BINNACLE, bin'-nd-kl, in Mar., a wooden case used on board ship to hold the compasses, log-glasses, watch-glasses, and lights, to show the compass at night. On board a man-of-war there are always two binnacles,one for the use of the man who steers the vessel, and another for the officer or sailor who superintends the

SHONIAL, bi-nō-mi-āl, in Alg., an expression consisting of two members, connected by the sign + or -. Thus, a+b and 8-3 are binomials, consisting of the sum and difference of these quantities. The powers of any binomial are found by a continual multiplication of it by itself. For example, the cube, to be  $a^3+3a^2b+3ab^2+b^2$ ; and if the powers of a-b are acquired they will be found the same as the pregending. to be  $a^2+3a^2+5a^3+5a^2+5a^2$  required, they will be found the same as the preceding, only the terms in which the exponent of  $\delta$  is an odd number will be found negative. Thus, the cube of a-b will be found to be  $a^3-3a^2b+3ab^2-\delta^3$ ; where the second and fourth terms are negative, the exponent of b being an odd number in these terms. In general,

being an odd number in these terms. In general, the terms of any power of a-b are positive and negative by turns. (See ALGEBEA.)

BIOGRAPHY, bi-og'-rd-fe (Gr. bios, life, and graphe, a writing), the history of a life, the name given to that department of literature which treats of the lives of individuals. Biography differs from history in that the former is confined to an account of the actions and fortunes of individuals, while history deals with large communities of men, states, or nations. History may, indeed, be said to be the essence of innumerable biographics. Some of the earliest records that we possess are works of biography, or of biography and history combined. In the historical books of the Old Testament we meet with numerous lives of individuals; as ment we meet with numerous lives of individuals; as Abraham, Joseph, David, &c. Of purely biographical works, the most valuable that has come down to us from the Greeks, is the "Parallel Lives" of Plutarch, a work of the 2nd century after Christ; "The Lives of the Philosophers," by Diogenes Laertius; "The Lives of Philosophers," by Runapius; and "The Lives of the Sophists," by Philostratus, are the other principal works of this class in the Greek language. Of single lives, we have a life of Homer, atributed to Herodotus; of Plato, by Olympiodorus of Alexandria; BIMANA, bi-moil-no (Lat. bis, twice, manus, a hand), rodotus; of Plato, by Olympiodorus of Alexandria;

and of Apollonius of Tyana, by Philostratus. The principal hiographical works of the Romans are, "The Lives of Eminant Greek and Reman Commanders," by Cornelius Nepos; and "The Lives of the Twelve Cornelius Nepos; and "The Lives of the Twelve Cornelius Nepos; and "The Lives of the Twelve Consess" by Suctonius; the latter being necessarily in some degree historical. Tacitus has also written an admirable life of his father-in-law Agricola. Of modern biographical works the name is legion. Among the more prominent may be mentioned Vasari's "Lives of the Painters." (1850); Tillemont's "Mémoires pour servir à l'Histoire Ecolésiastique des six premiers Siècles de l'Egias," 16 vols. 4to (Paris, 1893, &c.); Stanley's "History of Philosophy," containing the lives, opisione, actions, and discourses of the philosophymical devery sect., 4 vols. (London, 1855-62); Baylo's plans of every sect., 4 vols. (London, 1855-62); Baylo's \*\*\*District of the property of Figs. (1856-7); and the Biographical section of this Diotionary. Of single lives, Boswell's "Life of Johnson" is regarded as the best in our language. In subject of subject of study. Account for it as we may, there is to man something amazingly bewitching in human nature. He has a far more intense and restless suriosity in regard to this than to any other subject of study. Every one finds in a biography something that be can understand and sympathize with; for after all, one man is pretty much the same as another. One may have a little more of this faculty and a little less of that, more reason and less imagination, higher intel-lectual and lower moral faculties than another; but, after all, there is much in common between them, the variety being sufficient to afford every one matter for comparison, it may be to feed his self-love, or it may be to strengthen and encourage him in his onway do to strengthen and encourage him in his on-ward course. "Samuel Johnson, or perhaps another," says Thomas Carlyle, "used to say there was no man on the streets whose biography he would not like to be acquainted with. No rudest mortal walking there who has not seen and known experimentally something which, could be tell it, the wisest would hear willingly from him. . . How inexpressibly comfortable to know our fellow-creature; to see into him, understand his goings forth, decipher the whole heart of his mystery; may, not only to see into him, but even to see out of kira, to view the world altogether as he views it; so him, to view the world altogether as no views it, so that we can theoretically construe him, and almost practically personate him." "Biographics," says Lord Jeffrey, "are naturally of three kinds, and please or instruct us in at least as many different ways. One sort seeks to interest us by an account of what the individual in question actually did or suffered in his own person; another by an account of what he saw done or suffered by others; and a third by an account of what he himself thought, judged, or imagined—for these too, we apprehend, are acts of a rational being, and acts frequently quite as memorable and as fruitful of consequences as any others he can either witness or perform. Different readers will put a different value on each of these sorts of biography; but, at all events, they will be in no danger of confounding them. The character and position of the individual will generally settle with sufficient precision to which class his me moirs should be referred; and no man of common sense will expect to meet in one with the kind of interest which properly belongs to snother. To complain that the life of a warrior is but barren in literary specula-tion; or that of a man of letters in surprising personal adventures, is about as reasonable as it would be to complain that a song is not a sermon, or that there is but little pathos in a treatise on geometry." In the first class he in-dudes, in its higher department, "the lives of leaders in and momentous transactions,—men who, by their force of character or the advantage of their position, have been enabled to leave their mark on the age and country to which they belonged;" and, in a lower and more private department, "the lives of individuals whom the ardour of their temperament or the caprices of fortine have involved in strange adventures, or con-ducted through the second class is chiefly for the cated serils. The second class is chiefly for the compilers of diaries and journals,—autobiographers

who, without having themselves done sayshing me-morable, have yet had the good luck to five through long and interesting periods, and who, in chronicing the events of their own unimportant lives, have indi-dentally preserved memorials of contemporary manners and events." "The last class is for philosophers and men of genius and speculation,—men, in short, who were, or such to have here, arthors, and where the were, or ought to have been, authors, and who graphies are truly to be regarded either as supp to the works they have given to the world, or substi-tutes for those which they might have given. These are histories, not of men, but of minds, and their value must, of course, depend on the reach and capacity of the mind they serve to develop, and in the relati magnitude of their contributions to its histor."

BIOLOGY, bi-ol'-o-je (Gr. bios, life, and logos, discourse), is the science of life. In its widest see it includes life in all its forms on earth, and thue com-prehends within its sphere all living organized beings. In a more restricted sense, it regards man only, and in this view it may be said to correspond with Physiology.

(See PHYSIOLOGY.)

(See PHYSIOLOGY.)
BIOTHANATUS, or BIATHANATUS, bi-o-think-d this
(Gr. bias, lite, or bia, violence, and thanatos, death), in
Med., denotes one who dies a violent death, or very
suddenly, as if there were no space between health and
death. The term was also applied by way of reproach
to the Christians in the early ages of the Church, on account of their enduring even unto the death; and were thus looked upon as little better than self-mur-

BIPAPILLABIA, bi-pep-pil-lair'-i-d (Lat. bis, twice, papilla, a nipple), a term applied by La Marck to a gen.
of marine Mollusca, described and illustrated by Peron in his manuscript notes. La Marck defines it as pos-sessing a naked body, of a shape between oval and globular, terminated posteriorly by a tail, having at its extremity two conical papills,—whence the name.

BIPED, bi'-ped (Lut. bis, twice, and pes, pedis, a foot), an animal having two feet; as man, bird.

BIFES, bi'-pess (Lat. bis, twice, pes, a foot), a gen. of reptiles belonging to the ord. Saura, or Lizards. It is interesting as showing the gradation between one type of animal form and another, and is the connecting link between the Lizard and the is the connecting link between the Lizard and the Serpent. One of the species, the Bipes lepidopodus of Lacépède, was dissected by Cuvier, who found that though its posterior and only apparent pair of feet had merely the external form of two scaly plates, the integument, in reality, covered a femur or thigh-bone, a tibia and fibuls, lep-bones, and four metatarsal or finger-bones. He, however, found no phalanges or terminal finger-bones; and also noticed that one lung was larger than the other by one half. The Bipes lepidopodus of Lacépède has the body and tail very alender and almost cylindrical, and bears a resemblance slender and almost cylindrical, and bears a resemblance to the common blind-worm or slow-worm (Anguis fragilis), so common in many parts of England. These to the common blind-worm or slow-worm (Angust Pragilis), so common in many parts of England. These reptiles also possess the rudiments of limbs in their sheletons. The Bipes lepidopedus has the upper part of its head protected by nino large scale-plates; its eyes being surrounded with small scaly globules. Its teeth are equal and small, its mouth large, and its tongue, which is long and flat, is not notched. The organs of hearing are situated above the angle of the lips. The scales on the under-part of the belly and tail are hexagonal and smooth, but the scales on the back are lozenor-shaped, strigted and small carrecitles. back are lozenge-shaped, striated, and small, especially those in the highest part. About the centre of the reptile, two rudimentary feet, with no appearance of fingers, and covered with small scales, can be observed. Its colour is greenish, with small black blotches seat-tered over it. It is a native of Australia. Lacopade says of it, "This reptile, like the other species of bipes, ranks between the oviparous quadrupeds and the serpents. It is related to the latter by its general form as well as by the figure, proportion, and distribution of

as well as by the figure, proportion, and distribution or the scales, while it approaches the former by its auditory spertures, and by the hollow tubercles near the enus." BITUTILLATE, bi-pu'-pil-laif (Lat. bis, twice, pu-pila, a pupil), in Bnt., a term applied to that apot upon the wing of a butterfly resembling an sys, and having two dots or pupils of different tints within it. BIQUADRATIC FOWER, bi-quod-rai-life (Lat. bic, twice, and quadratus, squared), in Alg., the fourth

power or aquared square of a number or quantity; as 16 is the biquadratin power of 2; for 3×2 is 4, and 4×4 is equal to 16.—Biquabaara Boor or a Number is the square root of its square root; thus the biquadratic root of 61 is 3; for the square root of 81 is 9, and the square root of 9 is 3.—Biquabaara Equation, an equation where the unknown quantity of one of the terms has four dimensions. Any biquadratic equation may be generated by the multiplication of four simple equations; or by that of two quadratic canualtons. quadratic equations.

BIRCH. (See BETULL.) BIRCH. (See HETTLA.)
BIRD-BOLT, bird'-belt, an old form of arrow, to
which Shakepere, in "Much Ado about Nothing,"
thus alludes: "And my uncle's fool, reading the challenge, subscribed for Cupid, and challenged him at the
bird-bolt." Stevens, in a note upon "Much Ado about
Nothing," explains that the bird-bolt was "a short, thick arrow, without point, spreading at the extremity so much as to leave a broad flat surface, about the breadth of a shilling. Such are to this day in use to

kill rooks with, and are shot from a cross-bow. BIED-CATCHING, the art of taking birds or wild wi alive. It is performed in a variety of ways, ac-BIRD-OATCHING, the set of taking birds or what fowl alive. It is performed in a variety of ways, according to the season of the year or the species of bird intended to be caught. Some birds are taken by burning sulphur at night under the trees upon which they have been observed to perch. Pheasants are sensitimes caught in this way. If wheat or any other grain, steeped in a mixture of wine-lees and hemlocking, be scattered in places where birds resort, they become intoxicated after eating, and are easily taken.

Birds are also taken

Birds are also taken

by means of birdlime (which sce). The principal methods employed in catch-

ing birds, however, are by

traps and nets. Like everything else, the

trapping and catch-ing of birds is a

trap is the common brick-trap, repre-sented in the illus-tration. It consists of two bricks placed lengthwise upon their narrow sides, a third across their extremities, and a fourth at the opposite end, so as to form a sort of lid. In the central opening a stout piece of

stick is driven, and

means of



BRICK-TRAS



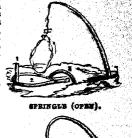
SIEVE-TRAP.

between this and shother similar piece supporting the lid, a forked twig is placed. When the bird alights on one of the forks is placed. When the bird alights on one of the forks of the twig, the other two sticks give way, and the lid falls, securing the bird. The next essiest of construction is the sieve-trap, shown in the accompanying woodcut. An ordinary siove in the accompanying woodcut. An ordinary siove is propped up by a slight stick at an angle of about 45 degrees: some seeds or crumbs of bread are strewn under the sieve, and a string attached to the supporting stick is held by the birdeatcher, who remains concealed at a short distance. When the birds gather round the food, the string is pulled, the sieve falls, and the birds are caught. Tho mext bird-eatching machine, the springle, is more diffi-cult to construct. At the smaller end of a hazel switch Sur feet long, which is called the spring, a piece of string about fifteen inches long is tied. Nearly at the end of this string, the catch, which is a little piece of wood half an inch long, about half as broad, and one

#### Bird-oatching

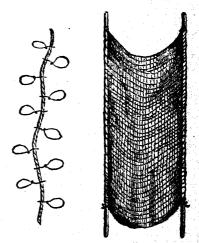
featened to the end of the string below the eatch, smaller switch, about a foct and a half in length, hent back at the smaller end, and featened within inch or so of the thicker end, in which a notch is o in order to receive the end of the catch; this is cal

the spread. A stump and a bender, which is another pliant bit of switch, each a foot and a half in length, complete the sprin-gle. It is set in the following manner :-The stump, No. 1 in the engraving, is thrust into the ground; the bow of what is called the spreader is placed over it, as No. 2; and then, about the length of the spreader from the stump, the two ends of the bender are pushed securely into the ground, as No. 3. The thick end of the long switch or spring is then planted at a convenient distance from the bender. It is bent down until



one end of the SPRINGLE (SET).

catch can be put upward on the inside of the bender. After lifting the spreader an inch from the ground, the smaller end of the springer is the catch is placed in the notch, and the springer is retained from springing up. The hair slip-knot is lastly laid round the spreader, and some crumbs or seeds laid in the inside of the trap and scattered about its neighbourhood. The springic is then set, and appears as in the illustration. When the bird alights trapping ing of birds is matter of practice, study, and expense. The most form of Ms heighnourhood. The springle is there were appears as in the illustration. When the bird slights upon the spreader, it falls with its weight, the catch is released, the springer flies up, and the bird iscaught by the neck, wings, body, or legs, in the horsehair alip-knot. A number of birds are caught by horsehair



HORSE-HAIR LOOP.

loops which are fastened to a long string, which is laid in a series of rings winding outward from the centre, wood haif an inch long, about haif as broad, and one in a series of rings winding outward from the centre, country as thick, is fastened. A small piece of the wood as that the space of ground is covered with them, is aboved off one side of this catch, in order to adapt. When disposed in a place warp birds resort, it is for a notch in another part of the springle; a loose generally occurs that if a bird gets his continuous alip-knot made of two long stout horsehairs is then the draws it tightly round his log, and is thus caught.

# Bird-natching Spider

Another mode of catching birds is by what is called "bat-fowling" and "bush-beating." The methods described above are employed by daylight, and with the assistance of decoy-birds, which, trained for the purpose, are placed in cages, about six or eight yards apart, and covered with branches to hide them. Their call-note allures the wild birds. Bat-fowling is pursued at night-time, some two or three hours after the birds have gone to roost. A large net, of the shape shown in the engraving, is mounted on two long poles. the birds have gone to roost. A large net, of the shape shown in the engraving, is mounted on two long poles, which are carried by two persons. Some of those engaged in the sport walk in front of the net, beating the tunbes, ivy, &c. Others walk behind the net, carrying a dim light in a bull's-eye lantern. The birds being disturbed, if yout naturally towards the light, and, in so doing, ity against the net, which is quickly doubled ever, and they are caught. Vaillant, in his "Travels in Africa," states that, in order to take certain birds alive, be put into his fowling-piece, above the powder, the end of a candle, ramming it well down. He then filled the barrel with water, with which he fired at the birds, and captured them alive and uninjured. In the Orkney Islands, eggs and young birds are collected by Orkney Islands, eggs and young birds are collected by the inhabitants in a most daring and hazardous manner, chimbing up rooky precipices, and sometimes being enspended by ropes, over the verge of clifts 300 to 400 feet high. In the Faroe Islands, still further north, the fowlers employ a similar method. The clifts are 1,200 feet high, and a rope 600 feet long is tied round the writer of the market in large of the root of t the waist of one man, who is lowered down the precipice by six associates. A piece of board is laid upon the margin of the rock to prevent the rope from being cut by the friction. In Mexico and China, empty gourds are left continually floating in the inland lakes where aquatic birds resort. The bird-catcher enters the lake with his body under water, and his head covered with a gourd. He quietly approaches the birds as they are swimming, and pulls them under water. In many parts of Russia, the gellinotte, or grouse, is taken in large quantities by means of an ingenious trap, made of birch twigs in a conical shape, with a movable wheel at the top. In Italy, the wild pigeons, on their return from the northern and western parts of Europe, are caught by means of nets, which are stretched across the hollows of the mountains through which the birds and nollows of the mountains through which the birds direct their course. A variety of other modes of catching birds will be found described in Pennant's "Birds of Great Britain," Buffon's "Histoire des Oiseaux," and in an article entitled, "Birds: how to trap and catch them," in Beeton's Boy's Oun Magazine.

BIED-CATCHING SPIDER (Mygale auricularia), an immense black hairy spider, a native of Cayenne and Surinam. It is nearly two inches in length, and its feet when stratched out covers a surface of reaching

feet, when stretched out, cover a surface of nearly a foot in diameter. The hooks of its mandibles are conical and very strong. It does not construct a web for the capture of its prey, as do other spiders, but builds in clefts of rocks or hollows among trees, a funuel-shaped cell of a transparent tissue, resembling fine muslin, and which it itself provides. oung one musin, and which it itself provides. There it lurks till insects, or, as is reported, even small birds, approach, when the spider darts out and secures its victim. Dampier mentions a spider of this genus, found at Campsachy, the fangs of which were "black as jet, smooth as glass, and at their small end sharp as a thorn." These fangs, according to the last-mentioned authority, are worn by some persons in their tobacco-pouches to prick their pines with and to be be athered. pouches to prick their pipes with, and to be, by others, used as toothpicks, in the belief of their having the power to expel the toothache. There are several bird-catching spiders besides the one in question, and they are found in America, the East Indies, and Africa. As well they make a web like the correspondent a rule, they make a web like the common European spider, but of such tough threads, that a thrush would scarcely be able to force a passage through. It is even declared, that, in certain tropical forests where these spiders abound, their nets will often impede the progress of the traveller. The bite of the larger species of this genus is said to be dangerous to human life.

Bush Churren. (See Cransus.)

Bush Larger species of this genus is said to be dangerous to human life.

Bush Churren. (See Cransus.)

Bush Larger species of the bound of the holly, and meet for extehing attist. The bark is bruised, boiled with water till very soft, and then placed in pits to ferment. After two or three weeks, a curious viscid mass a rule, they make a web like the common European

# Bird of Paradise

is found in the place of the soft bark : this is boiled is found in the piace of the sous serial rouns is possible with a fresh quantity of water, and evaporated to a proper consistence. Birdlime may also be prepared from the berries of the mistletes, from the young shoots of the elder, and from the cellular portions of other plants. When used, it is spread on twigt or wire-netting, and the wild birds are often drawn to the sticky perches by the treacherous singing of a decoy bird, placed in a cage near to them.

bird, placed in a cage near to them.

BIRD OF PARADISE, GREATER, për'-à-dies (Paradise Major).—These natives of New Guinea may be justly regarded as the most magnificent of the feathered tribes. Concerning them the most fanciful conjectures have been indulged in, not the least curious being one encouraged by Buffon, that the bird, having no feet, and being unable to walk or swim, was compelled to live entirely on the wing. This error, doubtless, took root in the fact that the legs of the bird being its least ornamental parts, were detached from the akin root in the fact that the legs of the bird being its least ornamental parts, were detached from the skin before they were prepared for exportation. They have great diversity of beauty. Some of them have thinly barbed feathers to cover the closed wing, so prolonged as to form immense tufts, and extending far backward beyond the body. The greater bird of paradise is rather longer than the common thrush. Its general colour is a deep cinnamon, with the exception of the top of the head and the back of the neck, which is a deep yellow; the feathers which decorate the base of the breast, and cover the whole of the throat, are of a pure emerald green. In the male bird, there springs from each side of the chest a full plume, from sixteen to eighteen inches long, composed of slender shafts, with loose, delicate webs. In some specimens they are bright yellow at the base, fading gradually into straw-colour. From the tail-coverts spring two slender, naked shafts of great length, which taper gradually to a point, and are of a rich brown. The Magnificent Bird of Paradise (Magnifica) is somewhat smaller than that above-described, and is chiefly distinguished by a double sort of ruff, composed of deep yellow; the feathers which decorate the base of distinguished by a double sort of ruff, composed of slender plumes that spring from the back of the neck. More of purple and blue enter into the plumage of this bird than the former. The King Bird of Paradise (Regia) is the smallest and the most precious of the family, both on account of its rarity and its splendid colours. It is scarcely as large as a sparrow. upper parts of its body are of the richest chestnutbrown, and the under parts dazzling white. A zone of prown, and the under parts dazzung white. A zone of golden green extends across the chest; from the sides spring two fan-like plumes, consisting of six or seven dusky feathers of the richest golden green. From the tail-coverts spring two long, slender shafts, each elegantly termnasting in a broad emerald web, rising from one side only of the shaft, and disposed into a flat spiral curl. The breast and legs are yellowish-brown. These birds fly in flocks of about tharty or forty, led, it is said, by a single bird. They fly against the wind, lest their plumage should be discomposed. When flying they make a noise like starlings; but their common cry is little more melodious than that of the raven. They are captured by birdlime and blunted arrows. No pains are taken to preserve them alive: as soon as they are captured they are killed, embowelled, their feet cut off, the plumed skins impregnated with sulphur, and then dried for sale. The skin, to which a great part of the flesh is allowed to remain attached, great part of the ness is showed to remain actaonees, is always much contracted by this drying process, and a very erroneous idea is sometimes formed of the size of the bird. With respect to their food, scarcely anything certain is known. Mr. Shaw, drawing the inference from the strength of the beak and legs of some of these birds, thinks it likely that they pray on the smaller of the feathered tible. Some they prey on the smaller of the feathered tribe. Some naturalists assert that they live on fruits and berries; and Linners, that they devour the larger butterflies. Bennet, in his "Wanderings," gives an account of one of these birds he saw in Mr. Beale's aviary at Macao, of these birds he saw in Mr. Beale's aviary at macco, where it had been confined nine years, giving no appearance of growing old. It ate insects in a living state, but would not touch them dead. When an insect was thrown into its cage, it contrived to catch it with great agility. It washed itself regularly twice a day, and after having performed its ablutious, threw its delicate feathers up over its head hood-wise. Its chief food during confinement was boiled rice and egg,

with an occasional bit of plantain, and a grasshopper or other insect. The Zoological Society of London have just enriched their collection by two young males of the Losser Bird of Paradise (Paradisea papuensis), brought from New Guinea in good health and fine

condition.

BIED'S.EXE VIRW.—The representation of a building; town, or any tract of country, as if seen from a considerable height immediately above it. The method of presenting a bird's-eye view of any place, in the common acceptation of the term, is to fix the horizontal line containing the point of sight (see PRESENCTIVE) considerably above the drawing, which renders it nothing more than a common perspective which is seen under circumstances which can renders to noming more cure in a common perspective, which is seen under circumstances which can scarcely be considered natural. The view so obtained is that which would be seen by a spectator standing on the top of a very high tower or mountain, and looking directly before him. In a true bird's-eye view, a ground-plan would be represented with great exactness, with all the objects that appear in it, at their relative distance from each other. In such a drawing, no side-view of a building, or any object rising from the surface of the ground, could be obtained. A correct idea of what true hird's-eye perspective would be may be gained by placing a small model of a hollow cube, or any building with its outhouses and surrounding walls and fences, on the floor of a room or a table, and looking down upon it while standing over it. It will be seen, as the eye is above the picture and looking down upon it, that the plane of the picture is parallel to the natural horizon, instead of being perpendicular to it; but that the rules which govern the relative position of all objects shown in the picture so formed are exactly the same as those adopted in ordinary perspective, the difference being in the position of the spectator only; as, in making a drawing in true

or the spectator only; as, in making a drawing in true bird's-eye perspective, he must consider himself as being above his picture, while, in the latter case, he is supposed to be standing directly opposite to it.

BIRD'S-MOUTH, in Arch, a small angle entering into any moulding, or a notch cut in the end of a piece of timber, to allow it to fit and rest upon the edge of another piece bearing on the upper surface, and on one eide, as rafters are sometimes cut to bear on the wall-ulate.

on the wall plate.

Birns (Ang.-Sax.), feathered vertebrated and ovi-parous bipeds, which are generally so constructed as to be able to support themselves in the air, and make progress through it. Every place in nature make progress through it. Every place in nature is furnished with its proper inhabitants. Both the land and the occan are illed with living creatures, each of which is so constituted as to be especially adapted to the course of life through which it is to pass. The great realms of air have their special occu-pants—the birds, whose extreme beauty, variety, swiftness of motion, and buoyancy on the wing, are admired by all. Blegant and symmetrical as the outward form of the bird is, it is surpassed by the internal construction, which is peculiarly adapted to its habits and mode of living. The large head, broad shoulders, deep chest, of lying. The large head, proad shoulders, deep cuest, and sinewy limbs of the quadruped, are replaced in birds by the pointed beak, the long supple neck, the gently-swelling shoulder, the expansive wings, the tapering tail, and the light, bony feet, all of which assist them in their motion through the atmosphere. Their bodies are protected from the intense cold in the air by a soft and delicate plumage, and their wings, air by a soft and delicate plumage, and their wings, although made of the lightest materials, are so powerful as to be able to strike the air with great force; their tails also serve as rudders, steering them in any direction they please. Internally, the frame of a bird is quite as wonderfully and appropriately constructed. All the benes are thin and delicately formed, except the sternum, or breast-bone, which is very large and strong. The clavioles, or collar-bones, are generally joined, forming the bone called the merrythought, which, together with two bones called the coracoid bones, keep the shoulders apart, and serve to resist the compressing action of the wings. All the muscles, except the pectoral nuscle, are small and light. In men and in quadrupeds, the pectoral muscles are In men and in quadrupeds, the pectoral muscles are small when compared with those of birds, which are very strong, and are situated on either side of the breast-hones. These muscles are used for moving the

wings. The anterior extremities of birds are al wings, and never arms or legs. In the cases of bir wings, and never arms or legs. In the bases of birds whose wings are too small to enable them to fig. they are used either as paddles in the water or to assist them in running. The great suk is an instance of the former, and the extrich of the latter. The lungs of a bird are situate close to the backbone and ribs. The six entering them from the windpipe, passes through, and is conveyed to a number of membranous cells which lie upon the sides of the pericardium, and communicate with those of the sternum. These cells are in some birds continued down the wings, and even to the pinions and thighs, and other parts of the body. They can be filled with air at pleasure, and by this means the bird can render his body heavy or light, when necessary, either in flying, swimming, or running. The vertebral column in birds is usually rigid in the central parts and flexible at both extremities. By this means the ribs are strengthened, and the free motion of the neck and tail assisted. In birds which do not fly, the vertebrase retain some amount of motion throughout the back; but, in general, they become ankylosed, or firmly united and cemented together by bone. The skull differs from that of the mammalia; the cranial bones are consolidated, and there are no autures in the skull of a bird. It is articulated to that part of the vertebral column called the neck by one condyle or joint, which is situated at the front margin of the great pital opening, through which the brain descends into the vertebral column, being prolonged as it were into the spinal cord. It is by this peculiar formation that birds have so free a motion of the head and neck, especially in a horizontal direction. The wryneck is a especially in a horizontal direction. The wryners is a special instance of this faculty; and many a youthful bird-nester has been scared from a wryner's nest when he has seen her twist her head completely round, hissing all the time like a snake. Birds generally alsop with the head turned back and nestled under the wing. In mental capacity, birds fully equal quadrupeds, and in some respects, indeed, surpass them. In some of the songsters, the brain has been said to exceed that the songsters, the brain has been sau 50 exceed that of man, when considered with reference to the comparative size of the head and body. The size of the brain of an eagle in relation to its body has been reckoned to be which part, that of a canary-bird with, and that of a man words and part. Parrots and starlings retain many words and phrases fixed in their memories, and some singing-birds remember whole melodies. Birds of passage, after travelling thousands of wiles and after being absent for a great length of of miles, and after being absent for a great length of time, remember the exact spot where their nests were previously located, or where they were reared. Prodence, cunning, and docility, are practically exempli-fied in the different positions in which birds build their nests, some in the neighbourhood of human beings and some in uninhabited places. Sight, smell, and hearing, are the most acute senses in birds. There are two classes of birds,—the carnivorous and the granivorous; classes of birds,—the carmivorous and the granivorous; and there is a middle kind, as in quadrupeds, which partakes of the nature of both. The carnivorous class is provided with long wings, furnished with very powerful muscles, in order to be able to fly great distances. They have strong hooked beaks, and sharp formidable claws; they have large heads, short necks, and strong, sinewy limbs; their sight is wonderfully acute, so as to enable them to see their prey at a great height in the six and they swoon down upon their victims with the air; and they swoop down upon their victims with an unerring aim. Carnivorous birds are solitary and sullen, and seldom live together in flocks. Granivorous birds, whose food consists of grain of various sorts, have larger intestines than carnivorous birds, and their digestive organs are more complicated. The form of the bill varies, according to the kind of food which the bird subsits on. (See Bill.) The food is passed from the bill into the stomach, which consists of three parts,—the crop, which lies in front of the breast-bone, the membranous stomach, and the gizzard. In the me memoranous stomach, and the gizzard. In the crop, the food undergoes a partial dilution from a fluid furnished by the glands. In the membranous stomach it is still further diluted, and then passes into the gizzard, which acts as a powerful mill, and in which the food is ground down and tritural triangle action of the gizzard is stangethand by many label the country in the country of the gizzard is stangethand by many label the country of the gizzard is stangethand by many label the gizzard is stangethand by many labels and the gizzard is stangethand by many labels and the gizzard is stangethand by many labels and the gizzard is stangethand by the gizzard in the gizzard in the gizzard is stangethand by the gizzard in the gizza the gizzard is strengthened by small hard stones, which many birds awallow with their food. The digestive powers of the gizzard are very extraordinary. An experiment was tried upon a turkey-cock, when a ball of lead, studded with twelve-small lancets, was forced down his throat. After eight hours had passed, the gizzard was opened, and the ball was found by itself, the whole of the lancets being broken to pieces. In the London museum of the College of Surgeons than in June 2014. of the College of Surgeons there is a large bottle entirely filled with publics, &c., taken from the stomach of an In some experiments tried upon a ben, it was found that a louis d'or, after being swallowed for four days, lost sixteen grains; and the weight of an onyx was diminished one-fourth. In carnivorous birds the The liver of domestic hirds is much larger than that of wild birds. It is considered a delicacy among • wide birds. It is considered a deleacy among governmends; and paties do foic gras are made from the enlarged livers of geese. The eyes of birds are admirably adapted for sight. The impression of external objects is rendered more vivid and distinct by a particular modification of the optic nerve. They have three eyelids, two of which, the upper and lower, are closed in most species by the elevation of the lower one. This may be noticed in domestic fowls. A small number of birds such as the owl and gost-sucker, can depress the apper eyelid. The third eyelid, a thin semi-transparent membrane, lies, when at rest, in the inner corner of the eye, with its loose edge nearly vertical. It can be drawn over the eye like a curtain; and by its means the eagle is said to be able to look at the sun. Were the eyes of birds less perfectly formed, on account of the rapidity of their flight, they would be liable to fly against any object in their way. The voices of birds distinguish them from all the rest of the animal world. The organs of the voice closely resemble certain musical instruments. At the bifurcation of the windpipe is a glottis furnished with appropriate muscles, where the voice is formed. The gift of song is only possessed by male birds, and their notes are generally expressive of love. They are silent when in ill health, in sadness, or love. They are shent when in in nearth, in sadness, or during rough weather; but when they are cheerful they always sing. They express different feelings with varied modulation; and the fear of approaching danger, hunger, love, longing for their mates, &c., are all expressed by changes in the tone of the none. This faculty is possessed by no other animal. Every form which the most lively fancy could create, and every hue that the imagination could conceive, are to be found in the feathers of birds. Two changes occur is the feathers,—one in the spring and another in the samema. In the former case the change occurs just before the breeding-time, and the bird gains a number of new feathers without losing the cld ones. In the latter, or moulting season, the old feathers fall off and new ones appear. The feathers of the wings are larger and stronger than those on other parts of the body. They are called wing-feathers, quill-feathers, or quills. At the hase of each quill are small feathers called wing-coverts. The tail-feathers are also provided with coverts above and below. Many birds have vary ornamental plumage in their tails; and the feathers often take other remarkable forms in different parts of the body; such as shoulder-tuffs, ruffs, crests, &c When and in the feathers of birds. Two changes occur the body; such as shoulder-tufts, ruffs, crests, &c When spring approaches, wild birds begin to pair and to make spring approaches, their young. The notes of the male birdst this time are very loud; and the marriage contract birdsthistime are very loud; and the marriage contract then entered into is for the season faithfully adhered to. In case one of the pair dies, its mate does not survive it long. The reproduction of the species smoog birds is carried on by means of eggs, which pass from the body of the female and are afterwards hatched. The warnth necessary for incubation is usually derived from the body of the bird, which sits upon the eggs. pon the eggs. This duty is generally performed by the female bird; but in some cases it is undertaken by the male. (See Egg, HATCHING, REPRODUCTION.)
Minny sea-fowl make no nests, but deposit their eggs
on the bare rock, or in rough boles scratched out of the earth or sand. The ostrich allows her eggs to be satehed by the heat of the sun in warm climates; but the site and broods over them where the temperature s colder. Birds generally brood once in the year, but senses. Birds generally proof once in the year, but see brood twice; and the number of eggs they lay res from the price of twenty. The cuckoo and a small mber of other birds ley their eggs in the nests of ser birds, in order to be hatched by them; and small birds are able to run about and find food as 274

soon as they leave the nest, while others remain in the nest for days and weeks before they can venture out. During this period the parent birds find food for them. At the breeding-season birds are often gragazious, and sometimes live together in one large nest. Birds nests are constructed with such delicate and exquisite art and ingenuity, as to call forth the admiration of every—beever. Birds of the same species, wherever they may be found, build their nests with the same kind of materials and in the same manner. The situations they select, the materials they use, and the form in which they build, are wonderfully adapted to the particular nature and necessities of the bird. They are generally lined with moss, wool, fine hair, or down, and have an exterior composed of straws, twigs or roots, and dry grass, mixed with clay. Birds that build early in the spring, such as the blackbird and thrush, line their nests with loam, in order to keep out the cold air. The common sparrow, who builds four or five nests in the year, is not particular as to the situation he chooses. Sometimes he locates himself in ivy, sometimes in trees and hedges, and often under the eaves of houses. Some birds carefully conceal their nests, and some leave them open and apparent; some, like the jay, build them so loosely that the eggs can be seen through the twigs; and some very compactly, such as the golden-crested wren, which constructs its nest with small pieces of moss and spiders' web interweaved. It is nearly an inch in thickness, and is lined with a profesion of soft downy feathers. While hatchwith a profusion of soft downy feathers. While hatching, all birds, as a general rule, resort to those places where their particular food is plentiful, and where there is an abundance of the proper material with which to construct their nests. Some water-fowls pluck the down from their own breasts, in order to line their dwellings; but they usually build in out-of-theway places, since their food is not that which is gathered way places, since their food is not that which is gathered, by ordinary birds. While hatching, the female bird is remarkably patient. She is usually plump where she begins to sit; but before the eggs are hatched she is almost reduced to a skeleton. Neither hunger nor danger will make her leave her post of duty; but if, after being absent, the male and female birds perceive. that their nest has been meddled with, they will often leave, and build in a securer place. After the young are fledged and flown, the nest is generally deserted. Many small birds live upon worms, caterpillars, &c.; and it has been remarked, "that a single pair of sparrows, during the time they are feeding their young, sparrows, during the time they are feeding their young, will destroy about four thousand caterpillars weekly; they likewise feed their young with butterflies and other winged insects, each of which, if not destroyed in this manner, would be productive of many thousands of caterpillars." The sparrow is usually believed to of caterpiliars. The sparrow is usually believed to of caterpilars." The sparrow is usually believed to be the gardener's enemy; but this would seem to show the reverse. Whilst moulting or changing their feathers, many birds turn sickly, and often die. Every country and climate have birds which are peculiar to them; but many migrate to distant lands when the season becomes too severe for them. Near the equator the birds are remarkable for their brilliant and varied plumage; but their voices are usually harsh and discordant. In the frigid zone, where fish is plentiful, they are mostly aquatic, and their plumage consists of soft, warm, downy feathers. In all countries birds live longer, comparatively, than either men or quadrupeds in the same place. Alany kinds of birds are important in an economical sense. A large profit is derived from the rearing of domestic fowls; and the flesh and eggs of most birds can be eaten. The flesh of fish-cating birds and birds of prey is considered unpleasant. Feathers are employed in many useful and ornamental ways, and the dung of birds is useful for manure. (See GUANO.)
From the earliest periods birds have been objects
of interest. Amongst the ancient Romans and Greeks, their habits and customs were not only well known to the husbandmen and augurs, but even to the general the husbandmen and angurs, but even to the general mass of people. Several poets refer to them as the harbingers of various seasons; and the title of one of the plays of Aristophanes is "The Birds." Aristotle, in his History of Animals, describes the classes and habits of birds accurately and philosophically; and in Pliny's Natural History the subject is also treated in a very learned manner. Pierre Belon, in 1555, was the first classicity of the property and the subject in the subject is the subject to the subject in the subject in the subject in the subject is the subject to the subject in the subject in the subject in the subject in the subject is the subject to the subject in the sub first goologist of note who wrote upon the subject of

## Birdmests

birds in later times. He placed the repactors birds first, the waders second, the swimmers third, and the which build their nests in trees or on the ground birds which build their nests in trees or on the ground fourth. About forty years afterwards, Aldrovandus of Bologna produced his work called "Ornithology." He followed the same arrangement as Belon, and added many new particulars of the habits and haunts of the several birds described. Francis Wilsughby, an Enseveral birds described. Francis Willinghby, an English gentleman, was the first naturalist in modern times who reduced ornithology to a system. His "System of Craithology," edited by Ray, the celebrated Cambridge professor, is a work of great merit. In it, hirds are divided into two general classes,— "land birds" and "water birds." The former are divided into those which have crooked and those which have straight beaks and talons; the latter are di-vided into three sections,—first, the waders; secondly, those which are of "a middle nature between swim ners and waders, or, rather, that partake of both kinds, some whereof are cloven-footed and yet swim, others whole-footed, but yet very long-legged, like the waders." The third class of water-birds consisted of waders. The third class of water-birds consisted of palmated birds, or swimmers. Ray's edition of Willinghby was, again revised and edited by Dr. Derham in 1713; as upon the works of these three naturalists Linnaus formed his ornithological system; and the orders in his class Aves are as follows:

1. Accipites.—Birds of prey, properly so called.
2. Pice.—Woodpeckers, crows, humming-birds, kingfishers, &c.

3. Anseres.—Swimmers. 4. Gralle.—Waders.

5, Galling,-Gallingceous birds; such as grouse,

partridges, and domestic fowls.

6. Passeres. — Sparrows, swallows, finches, doves.

6. Fasseres. Sparrous, swanow, menes, doves, thrusbes, &c.
In the year 1760 Brisson introduced his system, in which birds were divided into two classes,—those whose toes were furnished with membranes through their entire length, and those whose toes were without membranes. Buffon published his work upon birds in 1770, and Scopoli another in 1771. Cuvier, in 1817, published a new method, dividing birds into six classes at the same time expressing an opinion that all the systems he had seen were wrong. At the present day, it is also true that a correct arrangement has not yet been made. About 5,000 species of birds are known to exist; and the Dodo is a remarkable instance of a genus of birds which has recently become extinct. Class II. of the sub-kingdom Vertebrata, will be found one of the best modern arrangements. Amongst the most celebrated writers on the natural history of most ceisbrated writers on the natural instory of birds in Britain may be numbered Pennant, Lewin, White of Selborne, Bewick, Montagu, Donovan, Selby, Mudie, Macgillivray, Thompson, Meyer, and others. In America and the West Indies the principal anthors in ornithology have been Hernandez, Marc-grave, De Azara, Sloane, Catesby, Vieillot, Wilson, grave, De Azara, Sloane, Catesby, Vicillot, Wilson, Spir, C. L. Bonaparte (prince of Canino), Audubon, Richardson, Swainson, and Nuttall; while the birds of Europe have been learnedly treated of by Temminck, Meyer, and Wolff. Gould has written several valuable works, not only upon the birds of Europe, but upon the birds of Australia, the humming-bird, the toucan, &c. Several other illustrious authors have distinguished themselves in their works upon ornithology; amongst

themselves in their works upon orthology; amongst whom may be mentioned Buffon, Cuvier, Illiger, Strickland, Syme, and Yarrell. (See Obstructions.)
BIEDSNESTS, EDIBLE, the nests of a small Indian swallow, which are considered a delicacy, and are frequently mixed among soups. On the seaconsts of China and in Java, at cortain seasons of the year, vast numbers of these birds are seen. At their breeding, the state lears the inland counter to build in the time they leave the inland country to build in the rocks. They construct their nests out of a substance which they find upon the shore. This gelatinous matter is supposed by Kempfer to be molluses or sea-worms; according to M. le Poivre it is fish-spawn; sea-worms: according to M. le Poivre it is fish-spawn; and according to Linnseus, a kind of medusa or jelly-sah, called by fishermen blubbers or jelly-sare of a hemispherical shape, and about the size of a sare of a hemispherical shape, and about the size of a goose's egg; and in substance bear a strong resemblance to ichthyocolla or isinglass. They are gathered by the Chinese, and sent to all parts of the world, and guish the order of birds called Accipitres by Linnseus.

# Birds of Prey

are esteemed a great luxury. Mr. Marsden for great quantities of these nests in the island of Bu tra, particularly about Croe. A large cave, sit four miles up the river of that name, contains we numbers. The white nests are more valuable that the black, being found in the proportion of only size to twenty-five. Mareden says:—"The white sort sell in China at the rate of 1,000 to 1,600 Spanish dollars the pecul, the black is usually disposed of in Batavis for pecul; the black is usually disposed of in Darwisson about twenty dollars the same weight, where it is chiefly converted into glue, of which it makes a very superior kind." The same authority considers that the difference of colour is owing to the mixture of feathers with the viscous substance of which the nests are formed; and deduces that opinion from the expension of the control of the label. riment of steeping the black nests for a short time in hot water, when they are said to become in a great degree white. When the natives take the nests, enter the cave with torches, and by means of a ladde made of a single bamboo notched, ascend and pull down the nests, which adhere in numbers together, from the side and top of the rock. The more regularly and frequently the cave is stripped, the larger the pre-portion of white nests found. On this experience, the and frequently the cave is stripped, and larger the pay-portion of white nests found. On this experience, the natives destroy the old nests, that they may find white ones in their stead at their next search.—Bef. Count Hogendory's Coup d'Eil sur l'Ile de Java; and Craw-furd's Eastern Archipelago.

BIEDS OF PASSAGE are those bitds which migrate

from one country to another at certain times, depending on the seasons. Availing themselves of their proof flying, many birds remove themselves, at on Availing themselves of their power periods of the year, to places where the temperature is more congenial and the supply of food more abusdant. Even in the tropics, some birds, like the bird of paradisc, migrate from island to island, according to the change of seasons from the dry to the wet monacon. In the temperate and colder regions, however, birds of passage usually migrate from south to north or from north to south, north to south, as winter passes into summer or summer into winter. They are usually divided into two classes,—winter and summer birds of passage, the term being applied according to the time when they make their appearance. Hence the summer birds of passage in one country are the winter birds of passage in another. The approach of spring is always heralded by the arrival of summer birds of passage, and their appearance is always connected with pleasant and cheerful associations. During the winter season, large passage in one country are the winter birds of pass numbers of winter birds of passage, such as wild swans, geese, and other water-fowls, leave the frozen waters of the north and migrate to the shores of Great Britain. Woodcocks, fieldfares, redwings, and many other birds which breed in northern countries, also make their appearance regularly. The migrations of the pigeons in America are very extraordinary, on account of the vast numbers which compose the flocks. The return of some birds of passage can be depended on almost to a single day; and in some places, such as St. Kilda, where the inhabitants depend for their existence on the sen-fowl, their return is almost purousally on the same date every year. It has been observed that some birds of passage leave at the regular time, while others seem dependent upon the weather and temperature. Nearly all birds of this species have long and powerful wings; but some are anort-winged. They can pass over great distances in a very short period of time; and us they can fly with case at the rate of 50 to 150 miles an hour, they often arrive at their destination with comparative ease; but some birds, such as the woodcock, are often found much exhausted after their flight. That birds of passage return to the same places which they formerly inhabited, has been clearly proved in the case of swallows. At one time it was believed by many ornithologists that swallows hybernated; but this opinion has latterly been completely overthrown, and their annual migrations have been completely ascertained. The subject of the migration of birds is very interesting when taken in reference to the instinct which guides them. When a bird of passage is confined in a cage, or otherwise, it shows great inquietude and restlessness whenever the time of minimum of the confined in the conf

#### Birras

They have remarkably keen sight, and great perfection in the sense of smell. Many birds, however, which follow and prey upon other birds, do not belong to this order; and those which live upon fishes, worms, and insects, are not reckoned as birds of prey. There are two sections into which birds of prey are divided,—the diurnal and the nocturnal; the latter division is composed entirely of owls.

Composed entirely of owls.

BREUS, bis-rus (Gr. beros, a coat), the name given to the ordinary outer habit worn by Christians in Africa in the time of St. Augustine. In those early ages neither bishops nor presbyters were accustomed to wear any distinguishing habit but what was peculiar to all Christians; and when Eustathius adopted the pallium, or philosophic cloak, the council of Gangra decreed that "If any one uses the pallium, or cloak, upon the account of an ascetic life, and, as if there were twent holliums in that condemns those that with zero. some boliness in that, condemns those that with reverence use the birrus, and other garments that are commonly worn, let him be anathema."—Ref. Eadie's Ecclesiastical Cyclopædia.

BIRTH, birth (Ang. Sax. beorthe; Germ. burt, from the verb bæren, to bear), the act of introducing or leading into life of animals and vegetables. It is figuratively used for extraction, lineage, rank by descent. It also means to sustain or bear. A ship's station when riding at anchor is called a birth, or berth; so is the place on board in which chests, &c., are stowed, called the birth of the mess.

BIRTH, CONCEALMENT OF. (See CONCEALMENT OF

BIRTH.)

BIRTHDAY, birth'-dai .- Literally the day on which any one is born; but more generally used to designate the anniversary of that day. It corresponds with what the ancient Greeks called genethlion, and the Romans natalitius dies. Many of the ceremonies connected with the religion of the ancients were celebrated on birthdays; and the omens by which they estimated the felicity of the coming year were also taken on the same days. The birthdays of gods, emperors, poets, and great and illustrious men, were celebrated with great popp and splendour. The mode of celebrating these days was by wearing a splendid dress, and putting on rings, only worn on these occasions. The men offered up sacri-fices of frankincense and wine to their genius, and the women to Juno. Costly suppers were also provided, and treats given to their friends and clients, who, in return, made them presents, and offered vows and good wishes for the many happy returns of the same day. The birthday of Virgil was held with great ceremony by the wits and poets who succeeded him: Pliny states that Silius kept it with more solemnity than he did his own. The inhabitants of Rome and Constantinople celebrated the birthdays of their respective cities with great pomp and magnificence. The birthdays of emperors were commemorated with public sports, feasts, wows, and medals struck for the occasion. But the which they were born; indeed, the word natalis among the Romans was extended to all feast-days. Amongst the spcients, the day of their adoption was always considered as a birthday, and celebrated accordingly. Considered as a Dirthday, and celebrated accordingly. Three birthdays were observed by the emperor Adrian,—the day of his nativity, the day of his adoption, and the day of his inauguration. It was generally considered, in those times, that when men arrived at the highest honours in the state, they were born again; and the day was thenceforth celebrated as a birthday. The birthdays of the saints and martyrs denote the days of their deaths.

BIRTHS, MARRIAGES, AND DEATHS.

STATISTICS and REGISTRATION.)

BIRTEWORTS. (See ARISTOLOCHIACE E. Bis, bis (Lat., twice, or double).—The Latin root of

Bis, in Mus., a term which always implies that the bar or bars included with it in the same curve (drawn er or over the notes) are to be sung or played twice before the performer proceeds to the succeeding bar or

Bisour, bis-kit (Fr., twice-baked), a kind of bread, usually made in the form of small flat cakes. Formerly biscults were subjected to two bakings,—whence the name; but this is not found necessary at the present

## Bishop

biscuit. It is an article of very great importance or board ship, where, in long voyages, ordinary bread would become mouldy and unfit for food. Sailors biscuits are made from a dough of coarse wheat, water, and common sait. After being well kneaded, the dough is rolled out into a sheet of the required thickness for the biscuit. Each biscuit is then cut out and placed in a hotoven for a quarter of an hour. Immediately after baking, biscuits are removed to heated rooms, where they remain for two or three days, in order that all the moisture may be thoroughly expelled from them. It is for the same reason that they are all formed in the shape of flat cakes. The dough of capiormed in the shape of flat cakes. The dough of exp-tains' biscuits is partially fermented before baking, and is made of finer flour. Water-biscuits are com-posed of flour and water, with an addition of butter, eggs, sugar, or spices. There are many other varieties of biscuits; and the name is applied to several kinds of sweet cakes, such as sponge-biscuit, &c. Several of the large manufactories make more than twenty tons of hisuits weakly tons of biscuits weekly.

BISCUITS, MEAT, are made with a certain quantity of mest and flour, prepared and baked in the form of cakes. They are generally made by boiling slowly large pieces of raw meat in a small portion of witer. After a time the fat is skimmed off, and the remaining soup boiled down still further, when flour is added. The mass is then rolled out to the required thickness, and then baked and dried like ordinary ship-bisouits. Meat biscuits, when boiled with twenty times their own weight of water, and then properly seasoned, make excellent soup; and they can also be enten like ordinary biscuits. They generally contain half a pound of flour and the soluble part of five pounds of meat. They have been the means of preserving a large quantity of fresh meat, which the inhabitants of Australia and the Arrentin security was in the habit and the Argentine republic were in the habit of throwing away, as they had no market for it. Meat biscuits were first introduced into Britain in 1851, at

biscuits were first introduced into Dritin in 1004, ac the Great Exhibition, by Mr. Borden, an American.

Biscurr-ware, bis'-kit-wair.—Before porcelain or any other earthenware is dipped into the liquid glaze, it is fired to a certain extent previously, in order to render it porous and capable of absorbing water with avidity. The porcelain is called biscuit-ware after being the name have. thus once burnt. The unglazed bottles used for keep-

ing water cool are specimens of biscuit-ware.

BISE. (See ACONITUE.)

BISEOP, bish'-op, is a corruption of the Greek term episkope, which literally signifies a superintendent or inspector. It was employed both by the Greeks and Romans to designate certain civil officers who exercised some species of superintendency. On the introduction of Christianity, it came to be appropriated to ecclesiastical offices. It has long been a great question in the Church what kind of superintendency originally in the Church what kind of superintendency originally belonged to the bishop, whether it was of a church or body of Christians merely, or of a number of churches or pastors. The Presbyterians, Congregationists, and others, hold to the former opinion; while the Established Church of England and the Roman Catholics maintain the latter. In the English church the bishop is the highest of the three ministerial orders, and exercises oversight over a certain district, called his see or diocese. The bishop performs the functions of the contraction configuration conservation configurations. of ordination, consecration, confirmation, and excommuof ordination, consecration, confirmation, and excommunication. He exercises a superintendence over the pastors in his diocese in regard to their morals, the performance of their duties, &c. The bishop is elected by the chapter of his cathedral church; but the nomination is virtually in the crown. The sovereign, on a vacancy being notified, sends to the chapter a missive letter congé d'élire, that they proceed to clect a succesletter congé d'élire, that they proceed to clect a successor, at the same time naming the person they are expected to clect. If they do not proceed with the election within a short time, the king may nominate by his own authority; or, if they elect any other than the person named, they incur the penalty of a pramunire, which includes forfeiture of goods, outlawry, and other evils. A bishop must be at least thirty years of age. He is said to be installed in his bishopric, writes himself by Divine permission, and has the title of lord and right reverend father in God. The English bishops are, by virtue of their bishopries, lords of parliament, and sit in the Upper House. They

claim all the privileges enjoyed by the temporal peers, except that they cannot be tried by their peers upon indictment for treason or felony, nor at upon such trials in the court of the lord high ateward. They are seems in the court of the lord high ateward. They are also practically excluded from sitting on trials for capital offences; for they are prohibited by the canons of their church from being judges of life and death. The bishop of Sodor and Man has no seat in the Hames of Lords, and since the reconstruction of the control of the contro House of Lords; and, since the recent creation of the bishopric of Manchester, the last appointed of the other bishops has no seat (except those of Canterbury, York, London, Durham, or Winchester); so that the number of lords spiritual sitting in parliament might not be increased. In England there are in all twenty-eight bishops, including the archbishops of Canterbury and York, each of whom has his own see or diocese, in which he exercises ordinary episcopal functions. The bishops of his province, over whom he exercises a certain jurisdiction, are called his suffragans. The term originally, however, denoted a titular bishop appointed to assist the bishop of any diocese in his spiritual functions, and to supply his place when absent. The archbishop of Canterbury is styled Metropolitanus et Primus totius Anglie, and takes precedence of all the nobility of the realm after the blood royal. The archbishop of York is styled Primus et Metropolitanus Anglia, and has precedence of all dukes not of the blood royal, and all the great officers of state of the blood royal, and all the great officers of state except the lord chancellor. (See ARCHRISHOP.) The bishops of London, Durham, and Winchester take precedence of all the other bishops, who rank after them according to their seniority of consecration. There are twenty bishops in the province of Canterbury, and six in that of York. Formerly the incomes of the sees differed very much in amount; but latterly the acclesiatical commissioners have been from time the ecclesiastical commissioners have been from time to time, on the avoidance of sees, attempting to adjust their incomes. The present income of the archibishop of Canterbury is £15,000; of York, £10,000; of the bishop of London, £10,000; Winchester, £10,500 (on next voidance, £7,000); Durham, £8,000; Ely, £5,500; the others from £4,000 to £5,000, except Sodor and Man, £2,000. In Ireland there are two archbishops and ten bishops; one archbishop and three bishops, who take their seats by rotation, representing the Irish church in the House of Lords. Colonial hishoprics in connection with the established church have from time to time been created by the crown in the principal British colonies. The first of these was the bishopric of Nova colonies. The first of these was the bishopric of Nova Scotia, created in 1787; and at present the number amounts to thirty-nine. The salaries are in some cases voted by the imperial purliament from the consoli-dated fund; in others they are paid from the colonial funds, or are secured by bequests or contributions from the colonial bishoprics fund, or other charitable funds; or they are made up from two or more of these Church in Scotland; viz., of Edinburgh; Argyll and the Isles; Brechin; Moray and Ross; St. Andrew's; Dunkeld and Dunblane; Aberdeen; Glasgow and Galloway. There are fourteen Roman Catholic bishops in England, four in Scotland, and four archbishops and twenty-four other bishops in Ireland.

Bishor, a heverage composed of hot or cold bur-undy, claret, or other red wine, poured upon ripe bitter oranges, and then adding sugar and spices according to taste. It is drunk either hot or cold, and its quality depends entirely upon the excellence of the wine employed. In order to make bishop properly, the oranges ought to be well selected, and the white the oranges ought to be well selected, and the white part between the peel and the pulp rejected. It is called cardinal when made with white wine, and sope when made with tokay. Its present name was bestowed upon it in the 17th century; but it was known, under other names, in Germany, during the Middle Ages. It was imported into Germany from France

and Italy.

Bergor, Boy. (See Boy Bishor.)

Bishor, Boy. (See Boy Bishor.)

Bishorhor is convalent to see or diocese, and denotes the district over which a bishor's superintendense extends. At the time of the Conquest there were two archbishoprics and thirteen bishoprics in Brighad. In the reign of Henry I. two new bishoprics were formed,—Ely and Carlisle. To these Henry VIII. added six new bishoprics, viz., Westminster, Chester,

Cloucester, Peterborough, Bristol, and Oxford; but the see of Westminster was soon afterwards usited to that of London. From that period down to 1898 me-change was made in the diocesan distribution of England; but by 8 & 7 Will. IV. c. 77, a new bishopric was created, and the union of the bishoprics of Bristol and Gloucester provided for; and by 10 & 11 Vict. c. 108, the bishopric of Manchester was created. No change appears to have taken place in the distributions of the four bishoprics of Wales,—those of Bangor and St. Asaph in North Wales, and of St. David's and Llandaff in South Wales; and the bishopric of Man is said to date from the 5th century. At present, the province of Canterbury comprises the bishoprics of Canterbury, Rochester, London, Winchester, Norwich, Lincoln, Ely, Chichester, Salisbury, Exeter, Bath and Wells, Worcester, Linchfield, Horseford, Llandaff, St. David's, Bangor, St. Asaph, Gloucester and Bristol, Peterborough, and Oxford. The province of York comprises the bishoprics of York, Chester, Durham, Carlisle, Ripon, Manchester, and Sodor and Man. c. 108, the bishopric of Manchester was created. and Man.

Bisnor's, or Consistory Court, is an ecclesiastical court held by the bishop's chancellor or commissary in his cathedral church, or other convenient place in his diocese, for the hearing and determining of matters and causes of ecclesiastical cognizance happening within his diocese. An appeal lies from the decisions of this court to the court of the archbishop of the province. The functions of the bishop's court are now rarely called into action, as proceedings against the benefited clergy now take place under the Church Discipline Act, 3 & 4 Vict. c. 86, and against curates under 1 & 2 Vict.

BISMILLIN, bin-mil'-la (Arab.), a solemu phrase made use of by the Mahometans at the commencement of all their books, &c. It signifies "in the name of the most merciful God."

BIBMUTH, biz'-muth (Ger. bismut), in Chem., symbol Bi; atomic weight 213; specific gravity 9.8,—a metal of a greyish-white colour, with a strong characteristic tings of red. It is hard, brittle, and but slightly malletings of red. It is nard, prittle, and but signify manifolds. It flues at 507°, and is obtained in fine cubical crystals by slow cooling. The peculiar property it possesses of expanding as it cools, renders its alloys of great use to the typefounder and die-sinker. It also increases the fusibility of other metals with which it is united. The remarkable alloy known as "fusible metal" metal" contains one equivalent of bismuth, one of lead, and two of tin; fuses below 212°, and, by a car-tain admixture of cadmium, can be melted at a still tain admixture of cadmium, can be melted at a still lower temperature. (See Cabrium.) It is also occasionally employed in cupellation, and some of its compounds are used as pigments, the hydrated czychloride being used as a cosmetic under the name of peartwhite. Bismuth occurs in nature principally in the metallic form in the clay-slate and gness formations, its principal source being Schneeberg, in Saxony: its also found in Cumberland and Commell. Rismeth is also found in Cumberland and Cornwall. extracted from the ore by heating it in inclined cast-iron tubes with cups attached. The tubes are brought which are at the lowest part of the incline. Biamuth forms two exides,—the teroxide, BiO<sub>3</sub>, and an acid oxide, BiO<sub>4</sub>, or bismuthic acid. Teroxide of bismuth may be obtained by heating the nitrate to low redness: if is a yellow insoluble powder. The hydrated teroxide, which is white, may be obtained from a salt of bismuth by precipitation with ammonia. Biamuthic acid, or peroxide of bismuth, is formed when hydrated teroxide of bismuth is digested with a concentrated solution of potash, through which chlorine is passed. A red of potash, through which chieffer is percentian of bismuthate of potash is formed, and s red precipitate falls to the bottom, which, on being well washed and digested in cold nitric acid, leaves behind washed and digested in cold nitric acid, leaves behind a red powder, which is the hydrated acid. Nitrate of bismuth is prepared by dissolving the metal in dilute nitric acid with the aid of heat, which gives rise to four-sided prisms, which are decomposed by water into an acid nitrate, which remains in solution, and as basic nitrate, the trientirate of bismuth, falls as precipitate. It is used as a pignostate conductory of bismuth. The other compounds of bismuth are too unimportant to be described. Bismuth occurs in

mature associated with cobalt, eiver, tin, and areenic; also as an oxide, in bismuth other; as a sulphide, in bissuffine, or bismath planes; as an arsenide, a carbonate, ad a cilicate, in bismath-blends.

Brow, bl-see (Lat. Bos Bonasses).—The principal uropean regions where this animal is found are the against forests of Poland, the Carpathian mountains, at Lithusms. Its chief abiding-place in Asia is in the ghbourhood of Mount Caucasus. It is as large as a English bull, but looks much larger, on account of a wealth of shaggy hair, and is ten times as formidable, because of its tremendous strength and intense fero-city. Its head is small; its horns short, sharp, and strong; and its eyes red and flery. The colour of its biroug; and its eyes red and flery. The colour of the birde is rufous-brown. The American bison (Bos assertions,), commonly called the American buffulo, is birger, shaggier, and flercer even than the European species. The hair about its neck and shoulders is bushier, and of a fine texture. The hump, which is colong, diminishes in height towards the tail, lending chlong, diminishes in height towards the tail, lending a considerable obliquity to the outline of the back. On she crown of the head the hair rises in an immense see, and shows in thick, close curls before the horns; Selow the chin the hair grows like a beard, and falls as low as the knees. According to Catlin, and other travellers in North America, this maned buffulo affords travellers in North America, this maned cummo amorus meet only food, but every creature-comfort to three hundred thousand people. Its flesh is their meat; its skin serves them for coats, and beds, and boots; and walls for their tents, and tiles for the roof; and for saddles, and bridles, and lassos. The bones are converted into saddle-trees, into war-clubs, into whistles, and into musical instruments. Of the horns are made pins, needles, ladles, spoons, and spear-heads; the miseur serve as strings to their bows, thread to stitch their buffalo-robes and to form their tent-cloths, and we the attachment to their persons of scalps and such dessing nic-nacs as they may set store by. pleasing nic-nacs as they may set store by. The bison's feet and hoofs, when stewed down, yield a superior gine, largely used in the construction of hunting-spears and arrows. The mane of the animal is twisted sto ropes and horse-halters, and the tuft at the extre-sity of its tail is used as a fly-brush. The brains even re not wasted, but used in the preparation of leather from the bison's hide. The number of bisons roaming he wast North American prairies is said to grow less year by year; still herds consisting of thousands exist at the present writing. During the pairing season, the roaring of the bulls is terrific, and the combats that take place between them are unequalled even among the carnivors. They swim broad rivers in erly the same order as they traverse plains, viz., a dense animated mass, pressing so close at each others heels that the foremost dare not stop from peril of being trodden to death. The Indians profit by this peculiarity, and, ereeping up to a herd, drive them forward, with hideous shouts and yells, to the verge of a precipice, over which a score or so will certainly

BISERVILE, bis-sex'-til (Lat. bissextilis, from bis, twies, sentilis, einth), in Chron., is the name given to that year which contains 366 days, called, also, leapyear. In the Roman calendar, as reformed by Julius Casar, the length of the year was fixed at 3652 days; ut in order that the year should always begin with the beginning of a day, it was directed that every fourth a should have an additional day, the others having year should have an additional day was given to February, see being the shortest month, and was inserted between the 24th and 25th. By their mode of reckoning, the 24th was the sixth day before the calenda, or lst of March, hence called sexto calendas Martii; and in order to preserve the same enumeration, the interconter 20 preserve the same enumeration, the inter-culary or repeated day was termed bisectus dies, or the second sixth day, and the year in which it occurred bisectitie. In legal reckoning as to the birth of a child, the two sixth days were regarded as one. In our reckoning, the interculary day is made the 29th of

Bistoper. (See CLENDAR.)
Bistoper. (See POLICOUR.)
Bistoper, bis-too-re (Fr. bistoire), in Surg., is a small custod back ased for opening abscesses, and for

of wood: beenhwood is considered the best for purpose. The following is the method of prep purpose. The following is use meaned or preparing the pigment. Infuse a pound of the soot in two quarts of water, and boil it for thirty or forty minutes; the mixture must then be allowed to estile, and the clear firid poured eway from the sediment that has collected at the bottom. The liquid thus obtained must be at the bottom. The liquid thus obtained muss be evaporated until what substance there is remaining in this is called bistre, and is vessel is perfectly dry : this is called bistre, as made into cakes for water-colour painting by the addition of a little gum-water. Bistre is used in the same way as Indian ink and sepia for making water-o drawings to show the effect of light and shadow.

Brr, or Brrr, bit, in Mar, strong but short pieces of timber projecting vertically from the deck of a vessel, in the fore-part, close to either side, and strongly secured to the beams on which the deck-planks are laid. They are placed in pairs, and are principally used for fastening the cable when the ship is at anabor or moored alongside a quay. There are many kinds of bitts used for different purposes in shipbuilding,

and distinguished by various names.

BITTER-ALMOND OIL is a pharmaceutical product obtained by the distillation of bitter simonds with water. Martraès discovered it in 1803. The amygdaliferous portions of most Pomea, Amygdalea, the leaves of cherry-laurel, cherry kernels, peach, &c., yield the product. "The oil is thus prepared: Bitter yield the product. I also of its thus prepared; I have almonds are crushed, and freed from fixed oil by cold pressing; then stirred up to a thin paste with 4 to 6 parts of cold or lukewarm water, and the mixture allowed to stand for twenty-four hours before distallation. If distilled over the open fire, it is very apt to froth over, unless it is stirred continually; for this reason it is best distilled with vapour of water. may be done by covering the bottom of the still with a thick layer of coarse sand saturated with water, and pouring the almond paste upon it. The frothing may also be arounded by removing most of the solid matter before distilling. The first portion of the distillate is richest in oil, and in hydrocyanic acid also, and is therefore clear; the latter portions, containing less hydrocyanic acid, are milky. The distillation is con-tinued as long as the liquid which comes over smells of bitter simonds; the oil in the receiver is then separated from the water. The addition of chloride sodium facilitates the separation of the oil. 1,000 parts almonds do not yield more than 7 or 8 parts oil."

—(F. J. Conington, in Watts's Diet. of Chemistry.) Bitter-almond oil was at one time very much used in perfumery, and, being an expensive product, it is much adulterated. The adulterants are chiefly alcohol, some light ethereal oil, or nitro-benze, which last has in a great measure replaced the almond oil. "Light oils, whose smell is masked by that of bydride of b zoyl may be detected by allowing the latter to exidine into benzoic acid by exposure to the air, when the ameil of the former becomes avident; or by their effect, or the specific gravity of the oil, a method which applies to alcohol also. Alcohol may also be detected by agitating the oil with twice its volume of nitric said of specific gravity 1:42; with unadulterated off no imspecific gravity a net with unantitation and animaliate action is produced, but if 8 to 10 per cent, of sleohol be present, red funes are given off with affer-vescence. By using acid of 15 specific gravity, as little as 3 to 4 per cent, of alcohol may be detected. vescence. By using soil of 1 to specing gravity, as little as 3 to 4 per cent of alcohol may be detected. (Redwood.) A good re-agent for detecting adulterations is a strong solution of an acid sulphite of alkalimetal, which dissolves the pure oil entirely, but leaves behind all impurities which are not of the nature of aldehydes."—Watris's Dict. of Chemistry.

BITTER-ALMOND WATER.—Water containing a column of the oil of bitter almonds. It is prepared in

various ways. Sometimes a solution of the oil in spirits of wine is added to water; sometimes it is prepared by distillation with water, which is the best mode; but often it is obtained by mixing magnesis with the essentital oil, and adding it to the water. Laurel-water and cherry-water, the former prepared from laurel-leaves and the latter obtained from wild cherries, contain the same constituents as bitter-almend water.

BITTER PRINCIPLES are bodies which may be ex-Brief the sound purposes.

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#### Rittorn

Bituman

of the bitter products made use of in medicine and in borrow from Ure's Dict. of Arts. Manufactures, and the arts, are given in the following table, which we Mines, edited by Mr. Robert Hunt:

Name.	PART EMPLOYED.	COUNTRY.	OBSERVATIONS.
Quassia	Wood	Surinam, East Indies	Powerfully bitter.
Wormwood	Herb .	Great Britain	
Aloa		South Africa	Ditto.
Augustura		South America	Ditto.
Orange		South of Europe	Aromatic bitter.
Acorns		_	Ditto.
Cardius benedictus		Greek Archipelago	Ditto.
Cascarilla			Ditto.
Centaury		Jamaica	Ditto.
	Winner.		Ditto.
Camomile	Flowers	g 51 as	
Colocynth	Fruit	Levant	Intolerably bitter.
Colombo	Root	Hust Africa	Very bitter.
Funitory	Herb	Great Britain	Ditto.
Gentiana lutea		Switzerland	Ditto.
Ground ivy	Herb	Great Britain	Ditto.
Walnut	Peel	37 39	Ditto, with taunin.
Iceland moss	Plant	33 gg	Ditto, with starch.
Норв	Scales of the fe-		Aromatic bitter.
	C male nowers )	2) ))	Atomado Dictor.
Milfoil		29 22	· 1000 1000 1000 1000 1000 1000 1000 10
Satyrion, large-leaved		11 11	1
Rhubarb	Root	China, Turkey	Disagreeable odour.
Rue	Herb	Great Britain	Bitter and sharp.
Tansy	Herb. flowers	24 19	Bitter and offensive.
Trefoil, bitter	Herb	12 11	
Simarouba	Bark	Guiaua	I
Bryony		Great Britain	Sharp, bitter, nauscous.
Coffee	Seeds	Arabia	Agreeable.

regions skirting the Mediterra-neal, in China, India, and even in Southern Africa. It was formerly plentiful in this country; but the universal drainage of marsh land has driven to seck 21 locality more congenial to its When nature. alarmed, the bittern emits a pe-culiar cry, by no means pleasant to hear; but on means the approach of the breeding season the sounds it



BITTERN.

utters are of the most hollow and melancholy kind. The provincial English names are "Mere-drum." "Night-raven," and "Bull of the Frog." On the ht-raven," and "Bull of the Frog." On the be visible. " Most, if not all, the birds of the genus, especially our common heron, have on breasts a considerable space void of feathers, filled up by tufts of down, to which adheres a sort of clammy oily substance. It is not, therefore, unlikely that this oily matter may, either by smoothing the water or in some other way, enable the bird to attract, or, when attracted, to strike its prey with greater certainty."—(Stanley's History of Birds.) The length of the common bittern is about thirty inches, and its voracity remarkable. Mr. Yurrell found in the atomach of one the bones of a good-sized pike. The little bittorn is also a summer visitor to these islands, and is the smallest variety of the lamily to which it belongs known in Great Britain. It is an inhabitant of a wide range of countries, as it has been met with in south-western Asia, in Holland, Germany, southern France and Italy, and even as far north as Sweden. The

Bittern, bitt-tern (Du. butoor) (Botaurus stellaris). American bittern is somewhat smaller than the common bittern bird is generally found throughout the entire mon bittern. On the other side of the Atlantic this bird Eastern hemisphere. In summer it chiefly affects the north of Europe and Siberia, at other seasons the mild habits,—being called, among other titles, Indian-billet, mon bittern. On the other side of the Atlantic this bird has different names in the different states which it inhabits,—being called, among other titles, Indian-billet, Indian-hen, and Dunkadoo. The bittern once afforded great aport to falconers in England, and it was protected by severe penalties. Any one who destroyed or took away the eggs of a bittern was liable to a year's imprisonment and a line of eightpence for each egg, by a statute of Henry VIII. Yarrell, in his History of British Birds, informs us that "the bittern was formerly in some estimation as an article of food for the table. The flesh is said to resemble that of the leveret in colour and taste, with some of the flavour of wild fowl." Sir Thomas Browne says that young bitterns were considered a better dish than young herons. Turning to Yarrell once more, we find that " the bittern constantly feeding at night, is, therefore, seldom seen on wing in the day, but remains with head erect in thick beds of reeds, or conceals itself among flags, rushes, or other rank aquatic vegetation which afford it a solitary and secure retreat: "from such situations it is with difficulty made to take flight; and when at length obliged to get on wing, the pace is dull and flag-ging, and seldom sustained to any great distance. M. Viellot says that in France it is occasionally found in woods. Neither females nor the young differ much in their plumage from the male bird.

BITTERN, the mother-liquor left after the extraction of salt from sea-water by crystallization. It con-tains sulphate of magnesis, or Epsom salts, in large quantities, and is one of the principal sources of the

BITTERS, bit'-ters (Ang.-Sax.), the common name for au infusion of bitter herbs, which is consumed in large quantities as a stomachic, generally mixed with ardent spirits. The plant usually selected for the proparation of bitters is the garden ingelics (see ARCHARGELICA), Camomile-flowers the reots and seeds being used. coriander-seeds, and other vegetable tonics and stimulants, are occasionally employed.

BITTERSWEET. I See SOLANUM.)

BITTERWOOD. (See XYLOPIA.)
BITUHEN, bit'-n-men (from Gr. pitus, the pitch-tree,
because it resembles pitch), is a term which includes many fossil bodies of a resingua macra. True bitunes is fossil tur, and is the product of the action of an alevated heat upon vegetable bodies. The surrounding vated heat upon vegetable bodies. stratum, which is generally tertiary, is mostly impregnated with bitumen, giving rise to bituminous clay, shals, or coal, according to its nature. In many cases, bitumen occurs in nature as a regular deposit, forming beds like true coal. Lignites (which see) contain bitumen imbedded in them in small quantities. Asphalt is a finer sort of bitumen, much used in the preparation of paving-material. Bitumen is closely allied in its or paying material. Buttern is crosely aimed in its produced by the destructive distillation of coal. (See ASYMALY, PETROLEUM, COAL-TR.) The first process for obtaining pictures by means of light was founded upon the fact that the bitumen of Judes when exposed to the sun's rays became insoluble in oil of lavender, whilst those parts remaining in shadow preserve their solubility. This process has of late received a modification by which it has been applied to the purposes of photolithography, or engraving on stone by means of the sun's rays.

BIURET, bi'-u-ret (Lat. bis, twice, and urea, a chemical principle of urine), a compound, prepared by exposing ures to a temperature of 300° Fah. It has the exact composition of bicyanate of ammonia, and bears the same relation to that substance that ures does to

cyanate of ammonia

BIVALVE.

BIVALVE, bi'-valv (Lat. bis, double, valve, valves),
in Conch., a term given to those
kinds of shell-fish which possess two shells, in contradistinction to those which possess but one, and which are termed univalve. (See Mor-LUSCA.) As familiar examples of bivalves may be mentioned the mussel, cockle, and oyster. Bivalve shells form the testaceous envelope of mollusks, and are composed of two concave plates connected by a baving an elastic liga-

Bivovac, biv'-on-ak (Ger. beiwachen or bewachen, to watch over), in Mil., a term formerly applied to videttes of cavalry thrown out as outposts to watch the movements of the hostile force, and to prevent any attempt at a night attack. From the circumstance of these videttes passing the night in the open air without any protection, the word was at last taken to signify the state of an army passing the night on the field without tents or any kind of shelter. The practice was commenced by the French soldiery during the wars that followed the French revolution, who, for the most part, were without tents and the incumbrance of baggage, remaining on the field en bicouac, as they termed it, that their movements from place to place might be made with greater rapidity. Their example was aftermade with greater rapidity. Their example was afterwards generally followed by the European armies, and by the English in the Peninsular war; but it is pre-terable to provide shelter for the soldier in the shape of tents or huts whenever it is practicable, as his health suffers from exposure to the night air, and cold and wet, especially in the early part of a campaign. troops are in a bivouse, rows of large fires are lighted at intervals, round which the men group themselves, after piling their arms. These fires are kept up through the night, and the country around is searched for straw, on which the soldiers lie, after contriving some temporary shelter of loughs or boards, if they can be procured, to keep off wind and rain. Allowing about a dozen men to each fire, the fires of a biyoung sometimes afford the enemy the means of calculating the numbers of the force to which they are opposed .-Ref. English Cyclopædia - Arts and Sciences.

BITACEE, or FLACOURTIACEE, bix-ai'-se-e, in Bot.,

a nat. ord. of dicotyledonous plants in the sub-class The the sub-class contained the sub-class with internate leaves, usually entire and leathery, and very often dotted. The flowers are polypetalous or apetalons, the stamens being hypogynous, and equal in number to the petals, or some multiple of them. The fruit is one-celled, dehiscent or indehiscent, having a truit is one-celled, debiscent or indehiscent, having a thin pulp in its centre. The seeds are numerous, usually enveloped in a covering formed by the withered pulp. The plants of this order are almost confined to the hottest parts 22 the East and West Indies and Schrick. There are 34 genera and about 90 species. Many are feebly bitter and astringent, and have been used as stomachies. The bark of aphloid is said to be

emetic. The fruits of Oncoba and of some species of Placourie are edible and wholesome. The most important plant of the order is Bira orelland, which yields a red dye. (See Annarto.) The reddish purportering the seeds is the source of this colouring

BIXIN, bix', in (from bixa, the name of the tree whence annatto is derived), an orange-red colouring matter, found in annatto, to which it owes its dyeing matter, found in annatto, to which it owes its dyeing properties. It is a resinous substance, soluble in shoohol and ether, but sparingly so in water. The sikalies dissolve it, producing a deep red colour, but, on neutralizing, it falls as an orange precipitate. It is also soluble in fixed oils.

BIZARRE, be-zar' (Lat. bis, twice, and various, to vary), is a term derived from the French, and signifying odd, capricious, or fanciful. A person is said to be bizarre when his character, tastes, or opinions are incessantly changing and differing from those of other men, and who is characterized by attempting always to say and do what is singular. Bizarre is also applied to

something that is extraordinary or singular.

Bizarre, a term applied by floriets to a carnation with a white ground, marked with two or more colours.

(See DIANTHUS.)

BLACK, blak (Sax. blac) .- The total absorption of all the rays of light constitutes black. (See Colours, Light.) Amongst the mediæval illuminators, black signified evil, error, and wee; and the figures in their paintings are represented in black drapers when any of these subjects are portrayed. Thus, in the picture of the Temptation, Christ is represented in black robes. In heraldry, black, or sable, is symbolical of wisdom or prudence. From very ancient times, black has been worn as the emblem of mourning. In some of the Oriental countries, black is looked upon as a badge of servitude or low birth. The principal black pigments used in the arts are generally composed of carbon. They are vegetable blue-black, ivory-black, cork-black, and lamp-black.

BLACK ACT .- Previous to the statute 9 Geo. I. c. 23, the king's forest near Waltham, in Hunts, was infisted by lawless persons, who disguised themselves and blackened their faces, and were hence called Waltham blackened their faces, and were hence called Waltham Blacks. They committed great devastations on the deer; to prevent which, and similar offences, the statute enacted that persons bunting, armed and disguised, and killing or stealing deer, or robbing warrens, or stealing fish out of any river, &c., should be guilty of felony without beneft of clergy. The act was repealed by the 7 & 8 Geo. IV. c. 27.

BLECK LIVE. (See RELIVERS)

BLACK ALDER (See RHAMNUS.) BLACK ANT. (See ANT.)

BLACK ART, a name given to magic, as it was superstitiously imagined that all who exercised the art were aided by the devil in the accomplishment of the effects produced. As the pursuit of magic was deemed suiful in the extreme, and black was the emblem of wickedness and evil in the Middle Ages, so the term "black art," became applied to it. (See Magic.)

BLACK ASR. -Impure sods, contaminated with sulphide of calcium, charcoal, and other impurities, formed in the manufacture of soda from sea-salt. By lixiviation, filtration, and evaporation, the ordinary

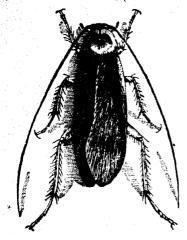
BLACK ASSIZE is the name given to an assize held in the old town-hall of Oxford in 1577, on account of an extraordinary and fatal pestilence which broke out during it. It is said that judgment had just been passed upon one Jeneks, a bookbinder, for sedition, who was sentenced to lose his ears, when there arose such an infectious damp or breath among the people. that many were then smothered, and others to deeply infected, that they lived not many hours after. Above 600 sickened in one night: and, from the 6th of July to the 12th of August, 510 persons are said to have died in Oxford and the neighbouring villages. It was popularly regarded as a divine judgment on the cruelty of the sentence. but it was of the sentence; but it was probably owing to the filthy condition of the neighbouring good where the prisoners had been kept. A similar pestilence is said to have broken out at Cambridge during an assize held there in 1521.—Ref. Anthony is Wood's History and Antiquities of the University of Oxford.

BLACK BAND, a clayey carbonate of iron found in

# Black-Beetle

Septland. It contains sufficient carbonaceous matter to allow of its being calcined without any additional fuel. It is found principally in the Socto coal-fields, and is the most important ore of iron in those districts.

BLACE-BEETLE, be tel (Blatta orientalis) .- These inaccis, though now common throughout Europe, are supposed to have been originally natives of India, and, by the progress of commerce, carried thence westward. On board merchant-ships the black-beetle is very commonly found; and it is said to be more plantiful in seaport-towns than other places. Their plentiful in seaport-towns than over purchashis are too unpleasantly familiar to us all to need habits are too unpleasantly familiar to us all to need description here. All sorts of matter, vegetable or animal, suits the appetite of these insects. The curious way in which insects of this genus lay their eggs is



BLACK-BEETLE.

worth mention. Instead of emerging singly from the shdomen of the female, they are inclosed in a horny case almost half as large as the abdomen of the parent. Within this the eggs are ranged in two rows, separated by a partition which runs down the middle of the case; each egg is also separated from the next by a similar egg is also separated from the next by a similar tion. This egg-case is attached to the wall or floor with a strong adhesive liquid furnished by the mother. When the larvæ are hatched, they emit from their mouths a fluid which dissolves the walls of their prison, and they are set free. The extrusion of the ponderous egg-case is sometimes a difficult matter with the mother; and she may be sometimes seen labouring about, and presenting the disagreeable appearance of

BLACKBERRY. (See RUBUS.)

BLACKBERRY. (See RUBUS.)

BLACKBERRY. (Turdus Merula).—This familiar bird furnishes a fair example of the general size and ap-

pearance the tyr the typical thrushes.

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BLACKBIED.

ground, in the air, and among trees, with equal facility; and this perfection of foot is more or less prevalent throughout the family. It builds a large BLACK FRIARS. (See DOMINICAN FRIARS.)

The shaped nest, composed of grass, roots, and stems BLACKGUARD, bldg'- ard, was a name originally externally, costed inside with mud, and lined with soft given to the scullions and coal-carriers in great houses

# Blackguard

grasses. It lays five eggs, generally of a light bine. There is sometimes, however, so little difference be-tween the eggs of the blackbird and the comment thrush, as to make it impossible for any one but as accomplished ornithologist to distinguish between them.

BLACE BOOK OF THE ENGLISH MONASTREES was a

BLACK BOOK OF THE ENGLISH MONASTREINS WAS B book compiled by order of the visitors of these establishments, under the reign of Henry VIII. It detailed the scandalous enormities practised in the religious houses, with a view to blacken their character, and to hasten their dissolution. Hence the phrase "to set one down in the black book."

BLACK BOOK OF THE EXCHEQUER.—The Liber Niger Scaccurii, or Liber Niger Parvus, appears to have been compiled in the reign of Henry III., and is now preserved among the other records of the Exchequer: It gives a description of the court of England as: it stood in the reign of Henry II.; the rank, wages, powers, and perquisites of the different officers of the court; the revenues of the crown, will of Henry II. &c. It has been printed by Hearne, Oxford, 1728.

BLACKCOCK, bluk'-kok (Tetrac tetrax), a species of the Grouse family, rarely seen in England, but abundant in Scotland. In its habits the blackcock closely resembles the capercalzie, inhabiting the low-BLACK BOOK OF THE EXCHEQUES. - The Liber Niger

closely resembles the capercalzie, inhabiting the low-



BLACKCOCK.

lying districts, and feeding chiefly on the young shoots of shrubs, and seeds, and berries. According to of shrubs, and seeds, and berries. According to Yarrell, in the winter time the bird's crop is frequently

BLACK DEATH is the name given to a most destruc-tive pestilence, which, towards the middle of the 18th century, extended itself over all parts of the known world. It took its name from the black spots which appeared on the skin. It was an intense form of the oriental plague, and, like it, was characterized by buboes and carbuncles. It is said to have taken its rise in China, and to have thence travelled westward to Europe, where it made its appearance in 1348. Some accounts state that the impure air was actually visible as it approached with its burden of death. Historians of that time give a most horrible picture of the sufferings and deaths that were occasioned by it. In Europe alone, during the three years that it prevailed, it is said to have carried off 25,000,000 persons, London having lost over 100,000. It was looked upon as a judgment of Heaven; and many thought to save themselves by giving their goods to the Church, or by personal chastisements. The Jews were also looked upon as the cause of it; and, in consequence, great numbers of them suffered death. In the city of Mayence alone 12,000 of them were cruelly murdered. The black death has several times made its appearance in Europe since that time, but never with the same virulence. Boccacio, in the introduction to his "Decameren," has given a lively description of its physical and moral effects in Florence; and a full and interesting account of it is to be found in Hecker's Epidemics of the Middle Ayes.

BLACK-FLUX, blak'-flux, a compound, containing carbonate of potash mixed with carbon, much used in the laboratory as a reducing or deoxidizing agent. It is prepared by heating tartrate of potash (cream of tartar) in a covered vessel until a charred mass remains.

(See BLOWPIPE.) (See DOMINICAN FRIARE.)

Black Watch

one. In the journeys of the families to which aged, they usually rade in the earts with the listing; and people in derision gave them a of blackgrands. The

course, low fellow.

L. difficulty, the term given to the place at in which soldiers undergo short terms possible that is which soldiers undergo anort terms impressionants for minor offences against military similars; and hance applied to the old village "lock-"," or "leage," the cells of a police-station, or any on in which persons are temporarily lodged in mance. In history, the "Black-hole of Calcutta" is a place, about 18 feet square, lighted and vented by two small windows several feet from the band in "skip 146 Regists merchants and soldiers. md, in which 146 English merchants and soldiers, The belonged to the garrison and factory that had been salely established at Calcutta, were imprisoned by maker of the Nebob Surajah Dowlah, on the evening of Jane 18, 1756. These unfortunate men, suffering want of air, unbearable heat, and intense thirst, and exhausted by the continual struggle to reach the sastew air-slits, sank one by one through the long sastew air-slits, sank one by one through the long sastesse and renewal of existence to twenty-three only, who had existed through the horrors that had caused the death of their fellow-sufferers.

BLACKING, blak - ing . - The manufacture of this familiar article is of comparatively recent date. The Romans, however, appear to have had a composition similar to that known at the present day as "dubbing." In digging the foundation of the new Royal Exchange, In digging the foundation of the new Royal Exemange, pieces of Roman leather were found, imbued with a substance skin to car modern blacking. Blacking consists principally of bone-black, sugar or treadle, sperm-oil, oil of vitriol, and strong vinegar. According to Mr. W. C. Day, the method of making the famous "Day & Martin's" blacking is as follows:—The bone-black in the formal control of the production black in a state of powder is mixed with the sperm-oil mutil the two are thoroughly incorporated. The sugar or treacle is then mixed with a small portion of the vinegar, and added to the mass. The oil of vitriol is next added, and when all efference has ceased, vinegar is poured in, until the mixture is of a proper e. This constitutes the liquid blacking of Day & Martin, by the manufacture of which thousands of pounds have been made by themselves and their Paste-blacking is made in the same way, eendante. sept that the last portion of vinegar is not added. To give some notion of the business carried on by this rm, it may be stated that as many as one thousand mer bottles are sent out daily. BLACK-JACK, sulphide of zinc, or zinc-blende

(See Zanc.)

BLACK-JACK, a vulgar term for a drinking-cup of tin mned over, formerly much used in England.

BLACK-LEAD.—The common commercial name for splate, or plumbago, given to that substance from metallic leaden-grey lustre. It is, however, nearly combon, and coutsins no lead. (See GRAPHITE, Presented, Carbon.)

BERNAGO, CARBON.)

BLACK-MAD PENCILS.—The manufacture of blackmed pencils was at one time almost exclusively conmed to this country, from the circumstance that the
est black-lead was found at Keswick, in Cumberland,
say, in pieces sufficiently large for cutting into pencimedias. The invention of Mr. Brockedon, for proag large blocks by compression, has of late greatly ided this important manufacture. By compressattended this important manufacture. By compress-age mass of finely-powdered pure black-lead, without any comenting substance, Mr. Brockedon procures blocks hard enough to be sawn into the square prisms which, when placed in grooves in wood, form the block-lead reneils of commerce. By adding portions of very finely-ground clay, black-lead of different shades is formed, varying from the triple H of the engineer, the mark of which is hardly perceptible, to the quadruple B of the artist, fit for filling in the deepest shades of the decimal B. W. Brockedon's process all nearly had become B. W. Brockedon's process all nearly had become B. W. Brockedon's process all nearly had become B. of his drawing. By Mr. Brockedon's process all posregard to an impalpable powder. A good black-lead and should make a perfectly even mark,—one will effect the control of the co traily effects of the latter material, proves that the leader sphingston of the latter material, proves that the leaders here adulterated with soot, lamp-black, or, as is

enerally the case, with sulphids of authors t substitute for Camberland load is that fr Bohemis and Bavaria. It is also found at Rhodes, in Behemie and Bavaria. It is also found at Rhodes, in France, in Spain, Ceylon, and Mexico; but is not warry inferior quality, being hard, gritty, and difficult to grind. By the process of Professor Brodie the most powder with great case. The mineral is counsely powdered and mixed with 4th of chlorate of potas), to which mixture is added twice its weight of sulphuris acid. Ohloric acid is disengaged, and, after the mass has cooled, it is well washed, dried, and heated to redness. During the latter operation, the plumbage swells and becomes reduced to so fine a powder that it will swim upon water. it will swim upon water.

BLACK LETTER is the name commonly given in this country to the old English or modern Gothic letter. What are called Roman letters were employed in the writings of Western Europe from the 5th to about the close of the 12th century, when the Gothic characters came to be adopted. When printing was first introcame to be adopted. When printing was first intro-duced, the object was to imitate writing; and the first printed books were dispessed of as manuscripts, the imitation being so perfect that it required great discrimination to distinguish the printed from the written. Books printed before the year 1500 are generally in the black-letter characters, when, in most European countries, they came to be supereded by the Roman. The old Gothic is still in general use in Germany, but now many books are printed there also in Roman characters. Books in the black letter are highly prized

by antiquaries and bibliomaniaca, as being the earliest.

BLACK LIST is a name popularly given to certain
printed lists privately circulated among subscribers,
giving lists of insolvents and hankrupts, protested bills, judgments for debt, and other matters affecting the credit of firms and individuals, and intended for the guidance of merchants and others in trade. The best-known of these are "The Mercantile Test," and "Perry's Bankrupt and Insolvent Weekly Gazette."

Black Mail.—Previous to the rebellion of 1745, the

Highlands of Scotland were in a very lawless condition. The stealing and carrying off of a neighbour's cattle was a system of plunder practised even by persons of standing and influence. To obviate this state of things, a class of men rose up who professed to take upon themselves the duty of protecting the property of individuals, upon payment of a certain annual sum, which was called "black mail." They generally also They generally also took care that the cattle of those who refused to pay black mail should be carried off. When, however, any one of the payers of black mail lost his cattle, the levier either recovered them or made them good. celebrated Rob Roy was a notorious levier of black mail in the western Highlands. After the rebellion, the law was more vigorously enforced in the Highlands, and black mail ceased.

PLACE ROD, USHER OF THE. (See USHER OF THE

BLACK ROD.)

BLACK ROOD OF SCOTLAND, in Scottish Hist., is the name given to a golden cross about a span long, elaborately wrought in the form of a casket, and containing what was believed to be a piece of the true cross. It was brought to Scotland by Margaret, the Anglo-Saxon princess, on her marriage with Malcolm Ceanmore, about 1070, and came to be regarded with great veneration by the people. It was taken possessing of by Edward I of England, in 1291, but was authorquently When David II. invaded England, in 1346, restored. When David II. invaded England, in 1346, he carried the black rood along with him; and, on his defeat by Sir Ralph de Neville, it became the property of the conqueror, who deposited it in Durkam Cathedral, where it remained till the Reformation, but subsection. quently disappeared .- Ref. Chambers's Encyclopædia.

BLACKTHOEN. (See PRUNUS.)
BLACK WAD.—A dense black earthy mineral used as a pigment, also in glazing pottery, and in the manu-facture of glass and chlorine. It is a hydrated per-oxide of manganese mixed with various impurities.

DIAGE of manganese mixed with various impurities.

BLACK WATCH.—The body of men so called were regularly enrolled, about 1729, for the purpose of watching the disaffected Righlanders, who were seeking an opportunity to renew the revolt against the government of the house of Hanover in the person of George II., which had been previously attempted in

1716, a twelvements after the accession of his father, George L. A few Highlanders had been intrusted with arms by the government about four years previously, but a greater number were now enlisted from the Campbells, Grants, and other clans well affected towards the government, and divided into six companies, here of 100 men each, under a incutenant. As these men wore tartans consaining of dark colours, they were called the Black Watch. In 1739 these companies, which had hitherto acted independently of each other, were incorporated into the famous 45nd ragiment, the command of which was given to the earl of Crawford. They were then relieved from the duty of watching the Highlanders, who took the opportunity to organize the rebellion of 1745.

Bilinks, blad-der (Sax. blader, from blauca,

BLIDDER, blad'-der (Sax. blader, from blawas, to blow), in Anat., is a thin membranous bag, which serves as a receptacle for the urine secreted by the kidneys, until it is voided through the urethra. It is strated in the sy the kinneys, until its voiced infrougation treature.
It is situated in the pelvis, and is kept in its place by ligaments, which are usually divided into true and false, the latter being formed of folds of the peritoneum. It is composed of three costs or membranes, the external or fibrous membrane, the middle or muscular membrane, and the internal or mucous membrane. Its figure is nearly that of a short oval. It is broader on the fore and back than on the lateral parts: broader on the fore and back than on the lateral parts; rounder above than below, when empty; and broader below than above, when full. It is divided by anatomists into the fundus or upper portion, the body, and the neck,—that portion which is constricted by a sphincter muscle, and communicates with the urethra. On each side, rather below its middle, it receives the two ducts called ureters, which convey the urine from the kidneys into the bladder. The bladder, like every other wears of the body is liable to carryin disease. one of the most common of which is inflammation, or systitis. It chiefly affects the mucous coat of the one of the most common or which is inhammators, or cystitis. It chiefly affects the nuccous cost of the bladder; but all the other costs may be implicated; and it is either chronic or scute. The scute form is known by great pain in the region of the bladder, attended with fever and hard pulse, and a frequent and painful discharge of urine, or a retention. The disease runs its course with rapidity, and subsides, or carries off the patient, in a few days. It is to be treated by local bleeding and hot fomentations, to-gether with opiates. The chronic form of this disease is best treated by tonics and sedatives. The causes of this disease are various. It often arises from calcarious secretions, which in that case must be removed. (See LITHOTOMY.) Irritability may exist in the bladder, unaccompanied by inflammation, and may arise from over-distention or from nervousness. It is to be treated by the administration of tonics. The bladder may be affected with paralysis, resulting either from accident, from disease of the nervous centres, or from overdistention. It gives rise to incontinence of urine, which, however, is to be distinguished from that which sometimes arises from irritability, inasmuch as in this case the bladder is full, and has no power to evacuate; so that it must be drawn off by the catheter. Retention of urine may be caused by mechanical obstacles to its exit, by paralysis, or by a want of power over the

BLADDERLOCKS. (See ALARIA.)

BLADDER SENNA. (See COLUMA.)
BLADE, blaid (Ang. Sax.), the cutting part of an instrument, distinct from the handle; as the blade of a
sword, a knife, or scythe. Damascus was farmous for the manufacture of sword-blades, which are even now

ane manusceure of sword-blades, which are even now, in consequence of their celebrity, of great value.

Blade, in Bot., a term generally applied to the expanded portion of a leaf. It is the part which is assally the most highly developed, and which is popularly known as the leaf. The terms lamina and leaf are also armiled to this new! (See Terms lamina) mb are also applied to this part. (See LEAR.)

BLANCHIMETER, bldm-shim'-s-ter (Fr. blancheach.)

BLANCHIMETER, blimeshim'ester (Fr. blanchir, to blanch: Gr. metron, a measure), an instrument used in ascertaining the bleaching powers of chloride of lime

## Blank Verse

plates with a thin cost of tin is also called blanch in ecokery, the term is applied to the peaking whitening of almonds, &c.

Minerally, a process adopted by gardeners for the purpose of keeping portions of the leaf or leaf-stall; a plant protected from the action of light. Under the of or loof stalls of a plant protected from the action of light. Under influence of the sun's rays, the leaves of plants decipose carbonic acid, the carbon of which goes to fi many of the substances which give them their im-vidual character. Amongst other things, wood-lib cannot be formed without the action of light. Wh light is excluded from plants, they remain almost white and lose nearly all their coarseness and bitterness, a and lose nearly all their coarseness and hitterness, as in the cases of seakale and celery. The inner leaves of the cabbage are naturally blanched; and the leaves of lettree are often tied together in order to blanch the interior. Celery is blanched by drawing the easth up to the plant, as it grows, in trenches; and seaked is blanched by covering the leaves with boxes or puts surrounded with straw, &c. Celery, seakels, and chambarb are sometimes blanched by growing them at the bottom of coal-mines. Although simple and easy, blanching is a very important branch of gradening, as blanching is a very important branch of gardening, as many plants depend upon it for their usefulness. Blanchings, or Blanchinger, the mony [Fz.

white food), a preparation of milk, cream cream, sugar, and isin-glass, which are boiled together. being After flavoured with lemon-peel,



BLANCMARGE.

brandy, &c.,
the fluid is run into a mould and allowed to stiffen. The

illustration represents a blancmange thus cast.

BLANK CARTEDGE, blink, a charge of powder for a rifle or other gun, containing no ball or shot. It is usually used for firing salutes and in exercising troops.

(See CANTRIDGE.)

BLANKET, blan'-ket (Fr. blancket, the blanket of a printing-press), a soft, loosely-woven woollen staff. ncipally used for bed-coverings and wrappers. addition to those sold in the United Kingdom, five or six million yards are annually exported to other constries. The manufacture of blankets is carried on principally at Dewsbury, Wakefield, and Witney. (See WOOLLEN MANUFACTURE.) Among printers, the term is applied to a woollen cloth or fine baize, which is laid between the tympans of a press. To toss in as blanket, by way of punishment, is a very ancient custom. The emperor Otho used to go forth upon dark nights, and if he found a drunken man, he went order the discipline of the blanket to be administered.

BLANK VERSE, is verse without rhyme, — verse where, according to Dr. Johnson, "the rhyme is blanched or missed." The verse of the Greeks and Romans,—at least all of it that has come down to us, is without rhyme. The Goths are said to have introis without rhyme. The Goths are said to have introduced rhyme from the East into the languages of modern Europe, and in the Middle Ages it came to be commonly employed in poetical composition, both is the Latin and vernacular tongues, by most of the nations of Europe. About the 15th century, when the passion for imitating classical models became general, attempts were made in Italy, France, and other countries, to reject rhyme as a barbarous innovation. The first attempt at blank verse in English appears to issue been a translation of the first and fourth books of the English up the carl of Surrey, who was executed in Æneid by the earl of Surrey, who was executed in 1547. Its suitability for the drama was at once felt. and it was in general use in dramatic composition before Shakspeare began to write, which is supposed to have been about 1591. It was, however, almost esto mee been about 1991. It was, newest, analysis tirely confined to the drama down to the appearance of "Paradise Lost," by Milton, in 1667. In an adventisement to the second edition of this work, the author, in answering objections to the want of thyme, says:
"This neglect of rhyme is so little to be taken for a ascertaining the protesh.

Blancairs, blanch'-ing, a term applied to the proease of whitening anything. In coinage, the operation set the first in English, of amient liberty recovered to the first in English, of amient liberty recovered to heroic poem from the troublesome and moders beam sleaning the money.

The process of covering iron age of rhyming." Since Milton's time, blank verse has also and the contract of the contra

# Blops

come into use in various kinds of poetry besides the drematic; but it is principally in the heroic metre of ten syllables that blank werse is used, and, indeed, by some the term is restricted to that kind of metre. As an example of blank verse:—

Of man's | first dis | obe | dience, and | the fruit Of that | forbid | den tree | whose mor | tal taste Brought sin | into | the world, | and all | our woe.

Frequently, in dramatic blank verse, a supernumerary syllable occurs at the end of the line; as,—

To be, I or not | to be, | that is | the ques | tion.

In blank verse, the poet is less encumbered than in any
other species of versification; and hence it is particularly adapted for subjects calling forth sublime
and noble emotions. "The constrained elegance of
this kind of versification (rhyme), and the studied
smoothness of the sounds, answering regularly to each
other at the end of the line, though they be quite consistent with gentle emotions, yet weaken the native
force of sublimity; besides that, the superfluous words
which the poet is often obliged to introduce, in order
to fill up the rhyme, tend farther to enfeeble it."—
(Blair). It is also free from the full close which rhyme
forces upon the ear at the end of each couplet, and
allows the lines to run into each other without constraint. The German language admits of the greatest
variety of blank verse, for it seems to be used in every
kind of metre.

BLAPS, bldps, in Ent., the typical genus of the fam. Blapsida, of that ord, of insects named Colerators. Blapsida, of that ord, of insects named Colerators. Blaps mortisaga, its common one the Churchvard Beetle. It is of moderate size, sometimes of a dark, but more frequently of a black colour, and is generally to be found in murky, damp situations, or the dirty parts of dwelling-houses. Mr. Westwood makes the following extraordinary statement with regard to these insects:—"Several instances have been noticed in which the larve have been discharged from the stomach. Of these the most remarkable account is that published by Dr. Pickells in the Transactions of the Associated Physicians in Ireland, of a case of a woman, aged 28, who emitted as many as two thousand larve of this insect at various times, as well as one pupa and one omago; and which probably originated in an absurd and superstitious practice which she had for some time followed, of drinking daily, for a certain time, a quantity of water mixed with clay taken from the graves of two Catholic priests, and eating large pieces of chalk. One of these beetles was immersed repeatedly into spirits of wine, but revived after remaining therein all night, and afterwards lived three years." Tabricius states that the women in Egypt eat the Blaps sulcata cooked with butter, in order to attain that corpulent condition of body so highly esteemed as an element of female beauty by the orientals.

BLASPHIAN, blus-fe-me (Gr. blasphemia, from blapto, I hurt, and pheme, reputation), literally means defamation or evil-speaking, and at first was weed to denote simply the blaming or condemning of a person or thing. Afterwards, however, it came to be restricted to an indignity offered to the Deity, either by words or writing. Hence Augustine says,—"Jan vulgo blasphemia non accipitur, nisi mala verba de Deo discree." In the early Christian church blasphemy was regarded as of three kinds,—1. The blasphemy of apostates, whom the heathen persocutors obliged not only to deny, but to curse Christ; 2. the blasphemy of heretics and other profan- Christians; and 3. the blasphemers were "ich as, after making a profession of Christianity, turned apostates, and blasphemed Jesus Christ; this being the usual test administered to them by their persecutors. The second were such as cade a profession of Christianity, but yet, either by impious doctrines or profane discourses, decogried from the majesty and honour of God and his not religion.—For the third kind of blasphemy, that against the Holy Ghost, see subsequent article. Undersubstantial law, blasphemy was punished with the state in the law of many civilized

## Bleschemy

countries. By the canon law, biasphemy was punished only by a solemn penance; and subsequently the corporal punishment came to be commuted into a pecuniary fine. Blasphemy is usually defined to be an injury offered to God, by denying that which is due and belonging to him, or attributing to him what is not agreeable to his nature. According to Angelus ascribed to God which is not suitable to his nature, alled by divines as in content missionities. It when called by divines a sin contra misericordiam; & whe some attribute essential to his Godbead is denied,contra justitium; and 3. when that which is only proper contra justicium; and 3, when that which is day proper to the Divine Creator is attributed to the creature;—a sin contra majestatem Dei. "Three things," says one, "are essential to this crime,—1. God must be the object; 2, the words spoken or written, independently of consequences which others may derive from them, must be injurious in their nature; and 3. he who com-mits the crime must do it knowingly." According to Blackstone, the offence of "blaspheming against the Aluighty, by denying his being or providence, or by contumelious reproaches of our Saviour Jesus Christ, is punishable at common law by fine and imprisonment, or other infamous corporal punishment; for Christianity is part of the laws of England." The first The first statutory enactment against blusphemy is 9 & 10 Will.

III. c. 32, entitled, "An Act for the more effectually suppressing of blasphemy and profaneness." It states suppressing of blasphemy and profineness." It states that "many persons have of late years openly avowed and published many blasphemous and infamous opinions, contrary to the doctrines and principles of the Christian religion, greatly tending to the dishonour of Almighty God, and may prove destructive to the peace and welfare of this kingdom;" and enacts that any person or persons having been educated in, or having rade a profession of the Christian religion within the person or persons having been educated in, or having made a profession of the Christian religion within this realm, "shall by writing, printing, teaching, or advised speaking, deny any one of the persons of the Holy Trinity to be God, or shall assert or maintain that there are more gods than one, or shall deny the Christian religion to be true, or the Holy Scriptures of the Old and New Testament to be of divine authority," shall for the Gerte of the shall deny the authority," shall, for the first offence, be adjudged incapable of holding any office or employment, ecclesiastical, civil, or military; and, on a second convic-tion, shall be disabled to sue, prosecute, plead, or use any action in any court of law or equity, and shall also suffer imprisonment for three years. The main provisions of this act remain still in force; but by 53 Geo. III. c. 160, those who deny the doctrine of the Trinity are exempted from its penalties. In 1841 the law against blasphen, was enforced upon Mr. Moxon for publishing an edition of Shellev's "Queen Mab;" but the sentence was merely nominal. In Scotland, blasphemy was, by acts of the Scotlish parliament passed in 1061 and 1695, punishable by death; and the last who suffered capital punishment for this crime in Scotland was Thomas Aikenhead, a student of divinity, who was executed 1696. These severe statutes were who was executed 1896. These severe statutes were, however, repealed by 53 Geo. III. c. 160, which made the punishment arbitrary. By act 6 Geo. IV. c. 47, the publication of blasphemy was punishable by fine and imprisonment, and by banishment for a second offence; but this last was repealed by 7 Will. IV. c. 5. which rendered the punishment only fine and imprisonwhich renewed the punishment only the and imprison-ment. In 1843 a person was tried before the High Court of Justiciary at Edinburgh, for publishing books deny-ing the truth and authority of the Holy Scriptures, and tending to bring contempt upon the Christian religion, and, being found guilty, was sentenced to fifteen months' imprisonment,

BLASTHEMY AGAINST THE HOLY GHOST.—Divines are very much divided in opinion as to what the nature of this sin was. Christ says, in Matthew xii. 3t (and to the same effect in Mark iv. 20 and Luke xii. 10), "All manner of sin and blasphemy shall be forgiven unto men; but the blasphemy against the Hely Ghost shall not be forgiven unto men." In the early church some applied it to the sin of lapsing into idolatry; others to a denial of the proper Godhead of Christ; others to a denial of the divinity of the Holy Ghost Augustine resolves it into obstinacy in opposing the methods of divine grace, and continuing in this observer, did the Church reckon to be beyond the power of

#### Blast-Furnace

forgiveness; for they did not refuse to receive into their body any one who professed repentance for his sins. The general opinion now is, that it consisted in the imputing of the miracles wrought by the Holy Spleit to the power of the devil, and that it was directed against the Jews. The saying of Christ was directly called forth by the Pharisees having said, "This fallow doth not cast out devils but by Beelzebub, the prince of the devils;" and was specially addressed to them.

BLAST-FURNACE. blast' fur-maics (Sar. blast blast.

BLAST-FURNACE, blast' fur-maice (Sar. blast; blast; Fr. fournaise, furnace), a furnace used in metallurgical operations, in which the combustion of the fuel is increased to an enormous extent by a blast blown from a bellows, or by means of fans. A smith's forge Blast-furnaces is a blast-furnace on a small scale. is a blast-furnace on a small scale. Blast-furnaces are used principally for smelting iron-ores, and consist essentially of a long narrow funnel inverted upon another shorter funnel, the whole being built of solid masonry. They are usually 50 feet high by 15 feet in diameter at the largest part. At the bottom of the lower cone is a sylindrical hole, from which lead the lower cone is a cylindrical hole, from which lead the tugbies, or blast-pipes, and the channel for the passage of the melted slag, which rises on the top of the metal and overflows. At the lowest part is the tap-hole for drawing off the melted metal. At the top is a gallery for the conveyance of fuel and ore. The blast-furnace being lighted with coal, the roasted ore, combined with a flux of limestone, is thrown in; upon this is thrown another layer of coal, and so on; as the fuel burns away the mass sinks, and is so on; as the fuel burns away, the mass sinks, and is replanished with fuel, flux, and ore from the top. The sunexed engravings relate to the construction of blast-furnaces, and to various improvements and modifications connected therewith. Heretofore it has been the custom, during the process of smelting iron-stone or ore, to allow the charge to remain some days in the furnace for the purpose of "cementing," as it is termed; such being understood to mean the distribu-tion of the metal over the surface of the material, so that it may receive the full force of the caloric evolved by the reverberation in the smelting-furnace. Fig. 1 represents a sectional elevation of a blast-furnace

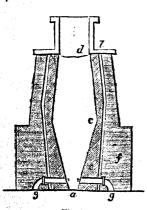
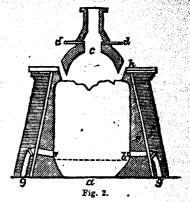


Fig. 1.

rounding the base in the figure just referred to. materials are thrown in from the top, which is open to the passage of the flame and unconsumed gases, instead of arresting their progress for the production of greater heat during the smelting process. Fig. 2 represents a modification of the above arrangements, consisting only in the dome or arched top placed just above the landing h, the object of which is to deflect downwards the rays of heat and the unconsumed gases anymorards the rays of heat and the unconsumed gases scolved; d shows two dampers for the purpose of regulating the draught, by opening or closing the crown of the dome; it are slots or apertures passing form, which is considerably less in height and greater transversely down by the sides of the landing for amplying the furnace. Fig. 3 represents a sectional of tuyeres, as well as offering facilities for feeding the

#### Blast-Furnace

elevation of a blast furnace of the improved constitution, the form of which being greatly diminished in height, the operation of raising up the materials for



forming the products is rendered less troublesome than hitherto. The mede of working and the arrangements generally are the same from the hearth upwards, with the exception of the boshes; the sides are nearly tical, with a slight curve at the shoulder or bending; the form of the dome

or cover, as before de-scribed for concentrating and retaining the heat, is of such material and construction that the effect pro-duced during the process of smelting iron-ore, or other metallic substances, causes quicker deposit of the products, enabling them to be entirely withdrawn at shorter intervals by the in-creased intensity of the heat generated. Fig. 4 shows a sectional plan view of fig. 2, taken through the dotted line

according to the old plan,

such as is now in use. The

construction will be readily

understood by reference to the woodcut:

hearth; b, the commence-

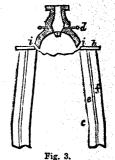
ment of the

boshes, and c the shaft; d is the crown for supplying the furnace: e is the lining of the furnace composed of fire-brick; f, the outer casing of stone or other suitable material;

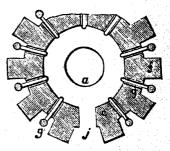
g g are the tayeres

sur-

i B the



at b; g g, as in the former instance, denote the trycres passing through the lining e e, the outer stone-work, ff, allowing communication being made to them by means of the recesses formed in the masonry; j is the tapping-hole. The chief novelties



sating the rise to the landing, se also a simployed for that purpose shows at a receptacle for the materials; b, a bottom, mounted on a centre, having furnace by decre is the recep

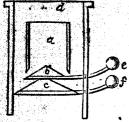
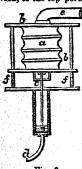


Fig. 5.

a weight (s) placed upon the arm or lever to which it is attached, for the purpose of keeping it closed and counteracting the weight of the trap or moving bottom; c is another, of a large other, of a large description, situated immediately beneath it, with a weight (f) and lever, as in the other instance; d is the crown of the fur-The action is nace.

as follows :- The

materials to be placed in the blast-furnace are directed through the chamber a, which, by the use of a conically-formed trap or bottom, are deflected off from the surface in an outward direction, and by falling on the larger one beneath, caused to descend and be de-posited round the sides of the furnace, when a greater degree of heat is given off. Fig. 6 represents a blowing apparatus, which consists of an upright framework, to the top portion of which the blowing apparatus is fixed, the other end



having a sliding bar working on the side-rods b; c is a small cylinder fixed to the bed-frame, with piston and connecting rod attached vertically to the lower portion of the blowing apparatus; d is the steam or ingress pipe; e, the blast branch-pipe communicating with the tuyeres. In putting the machine into operation, it is first necessary by suitable valves to admit the steam below the cylinder g, the effect of which upon the blowing apparatus will be to cause it to move upward, and impel the air from through the tube e

Fig. 6. into the furnace; ff are springs for bringing down the apparatus in readiness to be again raised by the steam piston. The patentee of this improved form of blast-furnace also describes an improved tuyère capable of passing into the furnace and being kept cool, without the application of water-passages through it, using for such means currents of air instead; also for combining and arranging blowing cylinders having steam-engines attached; the novelty of which consists in uniting two air-pump cylinders with inlet and outlet valves communicating with the tuyeres and working the same backwards and forwards by the up-and-down stroke of the piston, as hersetofore, the rod of which is attached to the pistons of the air-pumps, which are so constructed with buffers of india-rubber that when the piston completes each alternate stroke, it shall be prevented from the piston and of the available whereby a from striking the ends of the cylinder; whereby a pressure of air is maintained of uniform strength withont the employment of fly-wheels. The patentee also claims as a novelty his mode of employing two or more fans placed on the same shaft, and made to revolve by a rotary steam-engine in such a manner that the air or blast from the first fan shall enter into the second, and from the second fan into the third; and so on if desirable; thus accumulating a more powerful blast to be passed into the furnace than has hitherto been employed. The more important peculiarities of this invention are—the improved mode of constructing this invention are—the improved mode of constructing I mis, and as many such construction of the manner above described; the blasts to be fired, areefixed in their proper places along the conducting wire, and each is introduced the peculiar mode of arranging and combining blowing—the charging and tamping not to disturb the connections.

#### Blestine

cylinders having steam-engines attached, pressure of air is kept uniform withou ment of fly-wheels; the means of regulating bi air to blast furnaces by the presume of steam springs; finally, the application of two or more upon the same shaft when receiving motion from

shaft. (See Igon.)

BLASTING (Ang.-Sar.)—An operation in Mining
&c., by which large masses of rock are separated a
means of the explosion of gunpowder or gun-cotton A small opening is bored in the rock or stone, and A small opening is bored in the rock or stone, and is fired by means of a fuse or train. In engineering operations of large magnitude, chambers, and even galleries, are formed in the rock, bags of powder being inserted, and tired by means of the galvanic current. By this means enormous masses of rock, weighing thousands of the way are removed with the greatest case. One of of tons, are removed with the greatest ea One of the largest blasting operations known was that in which 400,000 cubic yards of cliff at Folkescone were removed at one time by the explosion of 18,000 lb. of powder, during the construction of the South-Eastern Railway. Blasting is also much used for removing submerged Blasting is also much used for removing sugmerger, wrecks: the ruising of the wreck of the Royal George, at Spithead, was effected by means of submarine blasting. The charges in this instance were fired by divers, the powder being ignited by a galvanic current. The sale of the recovered brass guns more than paid for the expenses of the operations. Submarine the same of the submarine merged rocks are removed in a similar manner, marine blasting of rocks has been successfully prose cuted, with the use of the diving bell, for sinking the holes and charging them with cartridges, contained in a tin tube. From this a smaller tube is extended to the surface, which, when filled with powder, is fired. The effect of powder fired under the pressure of the water appears to be greater than in explosions of a similar kind upon the land. The fragments are removed but a short distance, and little disturbance is caused upon the surface of the water. It has been found that ledges of rock in this situation may be found that ledges of rock in this situation may be reduced in height without boring holes, simply by exploding large charges of powder upon the surface of the rock by means of the galvanic battery. In this way the surfaces of several dangerous ledges of rock in New York harbour have been taken off, and the depth of water increased over them. In Scotland a battery has been introduced, of very compact arrangement, designed for igniting charges at a distance. It is constructed of zinc and cast-iron plates alternating with each, and about a quarter of an inch apart. The first and second it on plates are connected together as a double terminal plate, from which proceeds the wire forming the positive pole. The first zinc plate is united by a strip of metal with the third iron plate, the second zinc with the fourth iron, and so on to the end of the series, which may consist of twenty plates of zinc and twenty-one of iron. The last zinc plates of zine and twenty-one of non.

plate will be disconnected with the rest, and from this

connected with the negative pole. The proceeds the wire forming the negative pole. plates are separated by slips of wood a quarter of an inch thick, and are kept in place by two pieces of board at the ends, connected by cross strips at the poard at the ends, connected by cross strips at the sides, and with one at the bottom to prevent the plates from falling out. As two plates intervene between every pair in metallic connection, there is no occasion for partitions in the trough. The space required for a battery of twenty pairs, or of forty-one single plates, will not exceed twenty inches in length. Such a battery is readily constructed, and is found to be efficient at a distance of five hundred feet. By adding a section of the same kind, the charges may be fired at still greater distances. The conducting be fired at still greater distances. The conducting-wires of copper should be insulated by a covering of silk or cotton thread, and several inohes near their extremities be twisted together. The two ends should diverge from the twist as far as the diameter of the hole for the charge will admit, and a fine steel wire, like those used for the hair springs of watches, or a fine platinum wire, should connect the two pules. This, and as many such connections as there are

ons. A gatest has been intely taken out in this souncy or splitting rocks by the generation of heat without attaing an explosion. The inventors use a substance composed of 160 parts of sulphur by weight, 100 of subpetre, 50 of sawdust, 50 of horse masure, and 10-of common sait. The saltpetre and common sait are to which four parts of moissess of common sait. The sattpetre and common sait are dissolved in hot water, to which four parts of molasses are added, and the whole ingredients attred until they are thoroughly incorporated together in one many, which is then dried by a gentle heat in a room, or by exposure to the sun. After this it is fit for use. It is tamped in the holes bored for blasting rocks in the same manner as gunpowder, and is ignited by a fusee. It does not cause an explosion upward like gunpowder, but generates a gentle heat, which splits the rock.
The Austrian engineers prefer electricity as a blasting The Austrian signeers prefer electricity as a making agent. With the apparatus they employ, explosions have been produced at a distance of one and a half German leagues, and fifty mines exploded simultaneously on a line of a hundred fathoms. The process has been in use under water in the Danube, near Grein, and the marble quarries near Neustadt, for some years with the state of t with perfect success.

BLATTA. (See BLATTIDE.)
BLATTA BYZANTIA, in Pharmacy, is an old term for marine substance employed as a remedy for epilepsy, hysteris, &c. It is of a reddish-brown colour, pleasant odour, and shaped like a finger nail; whence it was also called *Unquis odoratus*. It was likewise used for the oblong operculum of certain shell-fish.— Ref. Mayne's Lexicon.

BLATTER, blatt-ti-de (Lat. blatta, an insect that eats away clothes), a fam. of insects belonging to the ord. Orthoptera. The insects of this family are extremely active and voracious. According to Mr. Stephens, there are only seven species indigenous to this country, among the most disagreeable of which is the well-known Cockroach, or Black-beetle. (See BLACK-BEETLE.) In hot climates, where the number of species of this family is very large, their ravages are exceedingly great. The largest of the genus is the Blatta gigantea of Linnsous, which is indigenous to the warmer parts of Asia, South America, and Africa, where "they plunder and crode all kinds of victuals, dressed and undressed, and damage all sorts of clothes, especially such as are touched with powder, pomatum, and similar substances; everything made of leather, books, paper, and various other articles, which, if they do not destroy, at least they soil, as they frequently deposit a drop of their excrement where they settle, and some way or other, by that means, damage what they cannot devour. They fly into the flame of candles, and sometimes into the dishes; are very fond of ink and of oil, into which they are apt to fall and perish; in which case they soon turn most offensively putrid; so that a man might as well sit over the cadaverous body of a large animal as write with the ink in which they have died. They often fly with the ink in which they have died. They often fly into persons' faces or besoms, and their legs being armed with sharp spines, the pricking excites a sudden horror not easily described. In old houses they awarm by myriads, making every part filthy beyond description wherever they harbour, which, in the daytine, is in dark corners, behind clothes, in trunks, boxes, and in short every place where they can lie concealed. In old timber and deal houses, when the family is retired at night to sleep, this insect, among other disagreeable properties, has the power of making a noise which very much resembles a pretty smart knocking with the knuckle upon the wainscoting. The Blatta cigantes. knuckle upon the wainscoting. The Blatta gigantea, in the West Indies, is therefore frequently known by the name of the Drummer. Three or four of these noisy creatures will sometimes be impelled to answer one another, and cause such a drumming noise, that none but those who are very good sleepers can rest for them. What is most disagreeable, those who have for them. What is most consigned and, there will have not game outstains are sometimes attacked by them in their sloop; the sick and dying have their extremities attacked, and the ends of the toes and fingers of the dead are frequently stripped both of the skin and flesh." The Blatta americana, or American cockroach, is another member of this troublesome family. size is somewhat larger than that of the black-beetle; but its destructive powers are little less. It is now becoming common in England, especially in scapora-towns, where it is brought with merchandise from 287

abroad. The Bietta lapposice is a survivide in the sound in Laplaced in gr When very numerous, instances have whose they have devoured the whole of winter provision of dried lish. Perhaps singular circumstance counteted with the consists in the manuer in which they dep Perhaps th eggs. Instead of laying her eggs singly, as most insects do, the female drops an oblong mass, which serves as a case for an emire family of young blates. From this prison Nature has provided the young insects with a means of escape at the fitting moment. This counists of a fluid which they emit, and which softens the cement of the deuticulated margins of the case, or cocoon, as it might be termed, in which they have hitherto been enclosed. The cocoon of the blatte contains about sixteen eggs, of an oblong oval form, arranged in a double series. In this protesting form, arranged in a double series. In this state of maturity ere they emerge into freedom. arranging and laying of this occoon occupy the female during a week; and so careful is she of this egg-pouch, that on leaving it she carefully covers in with the materials of the substance upon which she places it. The larves and pupes are equally active with the image, and not less destructive, differing for the most part in their smaller size.

BLAZONRY, blai'-zon-re (Sax. blæsen; Ger. blasse, to blow a horn; Fr. blasonner, to blase about, make public), the art of painting and describing armorial earings in heraldic phraseology. The term originated bearings in neutron of sounding a trumpet when a traight entered the lists at a tournament, after which the officiating heralds proclaimed his title, and the distinctive bearings on his shield, with his creat, badge, and motto. The principal rules for blasoung coatering, according to English usage, are as follows; but on the Continent they are not all observed with thirt differences. strict adherence. 1. In marshalling coats of arms it is false heraldry to place metal upon metal, or colour upon colour. 2. Begin with menticaing the metal or colour of which the field is composed, steing the direction of the lines by which it may happen to be divided; as, per bend, per fess, quarterly, &c., and if they assume other forms than the simple straight lines (see Engralled, Wavy, Raguly, &c.), and then proceed to the principal and secondary charges in order. 3. Shorten the description as much as possible, and avoid all repetition of the names of metals and colours, mentioning a charge of any colours. strict adherence. 1. In marshalling coats-of-arms it and colours, mentioning a charge of any colour or metal that has been named before, as of the first, of the second, &c. Thus, the cont-of-arms in the accom-

panying engraving would be described as Argent, on a bend engrailed gules, between two hurts, a mullet or, pierced of the second between two crescents of the first: in which then the principal charges on the field; and thirdly, the charges on the ordinary, in their proper metals and tinc-tures, without repetition. 4. tures, In describing charges in a



field or on an ordinary, between others of a different nature, always name that charge first which is nearest to the centre of the shield. Thus, in the above example, it is correct to say a mullet between two crescents, not two crescents with a mullet between them. 5. When saimals, plants, &c., are represented in their natural colours, they must be always de-scribed as proper only, without naming any metal or colour; thus we must say a swan proper, not a swan

colour; thus we make the colour; thus we make the colour of the colour o actinism), air, and moisture; and it occupied than months to effect what modern chemistry enables us to perform in a lew hours. The process of bleaching lines

# Bleaching-Powder

is very ancient, perticularly in Egypt, where white lines was greatly prized. Frections to the middle of the last century, the method of bleaching was unknown in Eugland; and the lines manufacturers of the North sent their fabrics to Holland to be bleached, whence they received them in eight or nine months. The Dutch method of procedure bonsisted in soaking the lines for several days in potach lye, which was used whilst bolding. The lines was then washed, and put into tube containing buttermilk, for several days. It was afterwards spread on the grass for some months, being continually sprinkled with water during this time. The linen was returned to England in a nearly white condition, and went by the name of brown Holland, a name still preserved by a partially bleached lines fabric. The first improvement in this tedious process was made by Dr. Home, of Edinburgh, who, by substituting weak sulphuric acid for the buttermilk, succeeded in reducing the time required to six or neven weeks. In 1787, however, a most important change was made by the discovery of Berthollet that the gas chlorine obtained by the action of hydrochloric the gas chlorine obtained by the action of hydrochloric acid on binoxide of manganese formed a very perfect bleaching agent. Chlorine was first used in solution; but it was not found to answer the purpose in this bondition. In 1798, Mr. Tennant, of Glaspow, took out a patent for impregnating dry hydrate of lime with chlorine gas, forming what is known as chloride of lime, or bleaching-powder. (See Rikaching-Powder.) The bleaching-powder of England and Scotlend are or bleaching-powder. (See RLEACHING-POWDER.)
The bleaching-works of England and Scotland are on
a par with the demand for their use caused by the enormous amount of calico and other cotton fabrics now manufactured in this country; and it is not too much to say, that the supremacy enjoyed by England as the great cotton-fabric producing country is due almost as much to the perfection with which bleaching amost as much to the perfection with which beaching is carried on, as to any other cause. The process of bleaching is briefly as follows:—Pieces of cotton cloth, or calico, are sewn together into a continuous web seven or eight miles long. This, being united at the ends, forms an endless band, which passes over rollers, like the endless band of a lathe. It is first drawn over a the the endless Dang of a nature. At a mount of the house fibres: it is then washed, to remove the dressing, and afterwards passed through a hot solution of lime. It is once more washed, to remove the lime, and then run through a weak colution of sulphuric acid. It is washed a third a weak solution of sulphuric acid. It is washed a third time, boiled in a solution of sode, washed again, and rinsad in a weak solution of bleaching-powder. It then lies for some time in a heap, to allow the chlorine to act; after which it is again dipped in acid, washed, steeped in soda, washed again, dipped in bleaching solution, dipped in acid once more, washed for the last time, dried, and folded, after naving been rived once more into pieces. The perfection of the ripped once more into pieces. The perfection of the machinery and method of working the chemical part of bleaching must be very great when a piece of calico 28 yards long undergoes so many complicated processes for sixpence! In 1803 the charge for the same amount of work was 7s. 6d. Hardly a week passes without some improvement in bleaching taking place, and the list of patents is full of contrivances of all kinds for atill further cheapening this important manufacturing process. The consequence of this activity is, that more fabrics are bleached in a few hours in a space a few feet square, than were bleached formerly in many months and spread over many acres of ground. The colouring matter of fibres seems to be a kind of resin, which is dissolved partly by means of the alkali used, and partly by the chlorine and dilute sulphuric acid Silk, straw, feathers, ginger, and certain spices, are generally bleached by means of sulphurous acid. Wax, however, is bleached by the combined action of light,

BLEACHING-Powner.—Of all bleaching compounds, chloride of lime is the most important. It is prepared by exposing slaked lime to the action of chlorine gas. Slaked lime may be made to combine with half its weight of oblorine. Chemists are divided as to the true composition of this valuable compound, some looking on it as a hypochlorite of lime, CaO.ClO, united with chloride of calcium, CaCl, while others regard it as a combination of chlorine with oxide of calcium, in the form of an oxychloride, CaOCl. Chloride, it is a combination of chlorine with oxide of calcium, in the form of an oxychloride, CaOCl. Chloride.

#### Blanning

off hypochlorous acid. Its principal use is as a bleaching agent; but it is also employed as a disinfectant with great success. (See Linn, Chicampa or.)

Biran, bleek (Leucieus alburnus), a little allyaryscaled fish, well known to British anglers. It is said
that the scales of the bleak are used in the manufacture

of imitation pearls.

BLEEDING, C. BLOOD-LETTING, Weed' ing (Sax. Medica; to bleed), in Surg., is the removing of blood from the body, with a view to the prevention or cure of disease. It is divided into general and local: venesection and arteriotomy are instances of the former; scarification, of the local control of the lo cupping, and the application of leeches, of the latter. General bleeding is had recourse to when the object is to lessen the whole mass of the circulating fluid ; local, when the object is to lessen the quantity in some par-ticular part of the body. Venesection is the mode usually had recourse to in general bleeding, and the veins most commonly selected for the purpose such those at the bend of the elbow. In proceeding to open a vein, a bandage is first placed moderately tight round the arm, above the elbow, to obstruct the return of the venous blood; and when the veins begin to swell, the operator selects one, and pressing the thumb swell, the operator selects one, and pressing are caumo of his left hand upon it, at a short distance below the spot where the opening is to be made, presses the lancet into the vein, and gives a slight cut upward in withdrawing it, so as to make the opening sufficiently large to allow the blood to flow out in a thin stream. When a sufficient quantity of blood has been abstracted, the operator's thumb should be placed on the cut in the vein and the bandage removed, when a folded piece of lint, placed over the wound and secured by a figure of 8 bandage, will be sufficient to prevent the bleeding, and the wound will speedily heal. It should be borne in mind, however, that bleeding is always a dangerous operation, even apart from the evils that may be produced from the abstraction of too much blood, and should never be performed, except in very urgent cases, by any but a skilful surgeon. For local bleeding, leeches are always the safest, and are most generally had recourse to. In dealing with leeches, it is well to remember that they are cold-blooded animals, and that heat is highly injurious to them, and undits them for the performance of their office. Hence, when there is a difficulty in making them fix readily, the part should be cooled with a cloth dipped in cold water, or moistened with cream or milk, or a single drop of porter, and the lecches confined in the proper situation under a small glass. In former times, bleedattuation under a small glass. In former times, bleed-ing was much more practised than it is at present. It was resorted to in almost every disease, particularly such as were inflammatory, or were thought to be so; and even where no disease existed, it was regarded as an excellent precautionary measure to have a v opened once or twice a year. Some contend that this mode of proceeding was then necessary, and that, since that time, a great change has taken place in the physical constitution of the people. Doubtless, there is some truth in this; but we cannot believe that the constitution of the people ever was such as to justify the wholesale bleeding that was at one time practised. For bleeding, or a flow of blood from any of the organs, see HEMORRHAGE.

BLENDR, blend (Ger. blenden, to dazzle), a term applied to several minerals possessed of a peculiar glittering lustre, such as hornblende, bismuth-blende, &c. The term, by itself, is generally applied to zinc-blende, or sulphide of zinc.

BLENNIEM SPANIEL. (See SPANIEL.)
BLENNIUS, blen'-ni-us (Gr. blenna, mucus), a gen of fishes belonging to the section Acanthopterygii and



ride of lime is a white, moist powder, continually giving pally recognizable from their having the ventral an

## Blennorrhees

placed before the pectoral. They congregate in small shouls upon rocky coasts, where upon the reflux of the tide, they may be often found in pools among the crevices of the rocks. Mr. Yarreli rates that five apecies frequent the English coasts. These are,—Montagu's, or the Diminutive Blenny; the Occluded Elenny, or Butterfly-fish; the Gattoruginous Blenny; the Shanny; and the Crested, or Yarrell's Blenny;

RELENSCRETCA, blen-nor-re'-a (Gr. blenna, mucus; ries, I flow), is a term used in medicine to denote an unusual discharge of mucus from any of the mucous mambranes.

BLESDOR, bles'-bok (Gazella allifrons), a fleet auto-lope of Southern Africa.

BLESDOR, blife (Sax. belihtan, to fall upon), a gene-ral term for a certain class of diseases which affect the cultivated grasses, especially the cerealia. It is generally limited to the disease to which wheat and other rilly limited to the disease to which wheat and other grains are liable, when the outside of the plant remains green and flourishing while the interior is filled with a powder having a very festid amell. This powder consists of a microscopical fungus in the shape of balls, so minute that four millions of them may be present in a grain. This disease is also called smut-balls, bunt, pepper-brand, and stinking rust. The name of blight has been applied to every kind of disease incidental has been applied to every kind of disease incidental to plants through changes in the state of the atmo-sphere, the condition of the soil, ravages of insects, parasitic fungi, &c. The name has also been given to diseases of plants which have arisen through errors in cuseases or plants which have arisen through errors in cultivation. Insects and parasitic fungi attack un-healthy plants first; and often when the evil has been ascribed to them, the true cause has been some mis-take in manuring the soil. A competent authority on the subject observes, "There is a kind of blight sometimes very prevalent, which has been referred to fungi, but which is, in fact, nothing more than an excessive development of the epidermal cells, which are no longer kept within bounds by the real cuticle," but become "elongated, and frequently branched in various ways, so as to form spongy or mealy patches, which are sometimes in such abundance as from their bright colour or peculiar aspect to attract general notice."
This species of blight does little damage to the plant on which it is found, and is most commonly ob-served on woody plants, such as vines and hawthorn. A similar effect sometimes appears on a few herbaceous

BLIND, blind (Aug. Sax.), a screen or shade at-tacked to either the inside or the outside of a window, as a protection against the sun. The most common form of inside window-blind consists of a plain hanging of union holland or linen. The wire-blind, another kind of inside window-blind, consists of a frame of woven wire-gauze, or of perforated zinc, and is fre-quently painted, and sometimes also lettered and figured. Outside window-blinds are called Florentine, Venetian, Spanish, and shutter-blinds. There are also other blinds for shop-fronts, skylights, &c., known by various

Spanish, and shutter-blinds. There are also other blinds for shop-fronts, skylights, &c., known by various names; as, common roller, spring-patent, &c.

BLUM, is a term applied to one who is deprived of the use of sight. There is none of the senses that affords such as endless variety of perceptions, such a fund of materials for the mind,—the imagination, to work upon, as that of sight. When one considers the infinitely greater amount of information that is received by the eye than by the ear, he is naturally led to the conclusion that the blind must be in a much more helpless and pitiable condition than the deaf. In reality, however, this is found not to be the case; and various attempts have been made to account for it. The blind, as a class, are lively and cheerful; the deaf, shy and melancholy, often morose and suspicious. "Take," says Dr. Watson, "a boy, it may be, of 9 or 10 years of age, who has never seen the light, and you will find him conversible, and ready to give long parratives of past occurrences, &c. Place by his side a boy of the same age who has had the misforture to be born deaf, and observe the contrast. The latter is insensible to all you say; he smiles, perspectively in the same of holy light; he enjoys the face of nature, nay, reads with attention your features, and, by sympathy, sensets your smile or frown. But he remains mute;

## Blind

he gives no account of past experience or of future hope. You attempt to draw something of this sor from him; he tries to understand, and to make him from him; he tries to understand, and to make him-self understood; but he cannot. He beassmes emban-rassed; you feel for him, and turn away from a seeme too trying, under the impression that; of these two children of misfortane, the comparison is greatly in favour of the blind, who appears by his language to enter into all your feelings and conceptions, while the unfortunate deaf-mute can hardly be regarded as a rational being; yet he pessesses all the advantages of visual information as direct sensation." The cause is not that the blind possess a greater, or snything like visual information as direct sensation." The cause is not that the blind possess a greater, or snything like an equal, stock of materials for mental operations, but that "they possess an invaluable engine for forwarding these operations, however scarty the materials to operate upon,—artificial language," which is the medium of thinking; and "its value to a man is nearly equivalent to that of his reasoning faculties." The truth is, that the deaf are far more isolated all their lives from these that hear that he his interesting the same of th that the deal are lar more tsolated all their lives from those that hear than the blind are from those that can offer our interest in each other," says Dr. Wilson, "far exceeds, and ought to exceed, our interest in the world; and from all this human sympathy the deaf are almost totally cut off; while the blind, excused from many duties which the seeing can only discharge, are peculiarly free to indulge in gossip with their more peculiarly free to indulige in gossip with their micro-favoured neighbours, and can largely exchange opti-nions with them. Moreover, the blind can sourcely fail to find their own tastes suited in some portions of the talk of their neighbours; "" whilst the deaf, unless they have a great aptitude for such occupations as employ the eye and the hand, are far more narrowed in their circle of studies, and much more solitary th in their circle of studies, and much more solitary than the blind." There have been blind travellers, like Holman; blind poets, like Homer, Milton, and Black-lock; blind divines, like Lucas and Troughton; blind mathematicians, like Saunderson and Moyes; blind naturalists, like Huber; blind historians, like Prescott; blind musicians, blind sculptors, blind mechanicians; indeed, Dr. Reid asserts that "sight discovers almost nothing which the blind may not comprehend." But their concentions of many thines must, at least But their conceptions of many things must, at least, be very imperfect; light, colour, and space, must ever be words which they cannot fully realize. The blind are able to make up, in great measure, for their want of sight by the greater development of their other senses. By assiduous application and attention, the senses of touch and hearing become much more deli-oate and acute. It has even been said that some have been able to distinguish colours by means of touch; but this seems very doubtful. By accurately distinguishing the various kinds and modifications of sound, they are the various kinds and modifications of sound, they are able to form correct ideas on many subjects. Much, too, depends upon the memory, which, from exercise, becomes much more retentive than in ordinary cases. "It is a remarkable fact," says Mr. Anderson, who has had large experience among the blind, "that they scarcely ever hurt themselves, either against furniture or in play. At Edinburgh, they were constantly walking about the crowded streets. There were four or five messequers whose business it was to carry home. about the crowded streets. There were four or five messengers, whose business it was to carry home all messengers, whose dusiness it was to carry nome am the goods sold,—baskets, mattresses, rope-mats; and not only did they do this with the greatest existiness, but they were daily in the habit of going to all parts of the city,—Leith, Portobello, and environs, to take measurements for bedding. I have many times had the dimensions of two and even three beds brought to me, all on memory, with a precision not exceeded by the most expert workman, including the exact allowance of so many inches to be cut out for the bedposts."—(Ref. Observations on the Employment, Education, and Habits of the Edind, by T. Anderson: The Lost Sames, by Dr. John Kitto; The Five Gaterays of Kassingle, by Dr. George Wilson.) It is estimated that there are no fewer than 3,000,000 of blind persons in the world at the present time. Of this vast number, 37,000 are in France, about 45,000 in Germany, upwards of 70,000 in Russia, about 3,000 in Holland, 6,700 in Sweden, upwards of 2,000 in Norwsy, and about 29,000 in the British isless. According to the census of 1851, there were, in Great Britain and the islands, of the British seas (exclusive of Ireland), 21,487 (11,27) and 10,214 females) persons totally blind. In proporation to the population, there was 1 blind person in so many inches to be cut out for the bedposts."

escry 675 in Greek Britsen; I in 675 in England and Wales; I in 661 in Gentlin Geolius, In Ireland there was I blind for seary 855 period. As compared with other countries, it is frome that in the level portions of Europa, comprising Belgium, Hanovar, parts of Generally, and the plains of Lombardy and Denmark, the average is nearly the same as that of Great Britain, being I in every 650 inhabitants. In more elevated against she preportion is considerably lower, except that in fluxway it is as high as I in every 462 inhabitants. The number of blind persons in early life is not large. Of the 21,487 blind persons in Great Britain, only 1500, or less than 14 per cent., were under 14 years of age (a preumstance tending to show that cases I blindness at birth are not very common); between 18 and 60 years of age, there were 8,466 persons, or about 39 per cent; while 10,102 persons, or 47 per sent, were above 60 years of age; showing that in many same the employments followed in pepulous manufacturing towns, and that crowded dwellings and other recognitions, by inducing diseases of the organs of sight, have caused a greater amount of blindness in towns than in rural localities. It is clear, however, from the census returns, that a much larger proportion of blind persons exist in the agricultural than in the manufacturing and mining counties. For example, in Wilts, Dorset, Devon, Cornwall, and Somerset, there was a naverage of 1 blind in every 758 inhabitants; whereas in the West Ridding of Yorkshire, there was I in every 1,231; in Leoda, the proportion of blind is 1 in every 1,231; in Life, and in Staffordshire, 1 in 1,602. This may partly arise from the greater proportion of blind in the arrivaltural districts; but it is also to be borne in mind that the blinds are located in our principal cities and towns. In London, the proportion of blind in the rural districts is owing in some measure to the constant expense of the eye to the sun and the inclemencies of the wester proportion of blind in the rural districts is owin

BLEET, EDUCATION OF THE.—It was not till towards the close of the last century that any effort was made for the education of the blind. The first school established for that purpose was that of Paris, founded in 1724. It was followed by those of Liverpool, Edinburgh, and London, established in 1790, 1791, and 1800, impositively. Since that time schools have been established in most of the large cities and towns of the kingdom. One great obstacle in the way of the education of the blind, are the numerous systems that at present are in use for teaching them to read. M. Haily was the inventor of the art of printing in relief; but various attempts had been made before his time to give them a knowledge of letters. The French system of M. Haily was subsequently much improved upon by Mr. James Gall, of Edinburgh, who employed only one alphabet in place of two (capital and small letters), and excluded curves and circles, substituting angles and straight lines. He published several preparatory books in this style for the use of the blind. A few years later, in 1832, the Society of Arts in Scotland offered their gold medal for the best arbitates and method of printing for the use of the blind, which was awarded to Dr. Fry. Mr. Alston, of the substray. The arphabetical comprise,—I. Means the properties—I liston's system of Roman capitals; 2. the American system of smaller capitals, with serreted odges; 3. the Prench Sphabetical; and A Alston's modified. The Printed Sphabetical; and A second of the substray are and alsocates and alsocates. Each of these system has its advocates and alsocates. Acades are printed in them; and, as few listing of the saystem has its advocates and alsocates. Each of these system has its advocates and alsocates. Acades are printed in them; and, as few listing of the property of the system are unintelligible to them. Mr. E. C. Johnson, in his "Tangible Typo-

graphy," thus lays down the conditions to be ratiolal in any system comployed in the baseding of the trind: "The system of emboused printing for their me show embrace at least the following features: It must somble as nearly as possible the type in ordinary or among those who have eventual; (a) that the bits scholar learning to read may have eventy possible be from words which have have eventy good to be from words which have been must described. (b) that have have been to the from the finger must described. from words which he hay have sometry sees which now his fingers must decipher; '60 that he derive help in learning from any one who can reordinary book, or, if needful, that his friend may be to read to him. 2. It must present the words som spelt in full, that, when he learns to write, he may in a correct manner, which others can read. I which the finger hardened by long work and the touch of the little child may be able aiths to discer. The system of Mr. Alston is that which seems to m with most favour, as being that which is most e learned and most nearly allied to ordinary letters. has simply adopted the ordinary Roman letters in such a form as to be most easily felt. The Americaus adopt Alston's system, but with a smaller type, which ren-ders their books more difficult to read, though it leasens the cost of them. In what are called the arbitrary systems, in place of the ordinary letters of the alphabet, arbitrary characters are adopted. One of the principal of these is the system of Mr. M. T. Lucas, which professes to be to a blind person what atenography is to a seeing person. His alphabet is composed of thirty-six obsracters, ten of which represent double letters. Not only are all letters omitted that are not necessary to the sound, but in many cases single letters stand for words; as f for the; y, yet; w, me; b, by, &c. The advantage claimed for the system is the saving of trues, nears, nears, and labour; in the printing lessens the cost of them. In what are called me; b, by, &c. The advantage claimed for this system is the saving of types, paper, and labour in the printing of books; but this is found not to be the case, for the characters occupy more space than if the words were all written at full length in Roman capitals; while it must be much more difficult to master, and must give rise to frequent confusion. The New Testament in Alston's system is comprised within 623 pages; whereas in Lucas's it occupies 841. The system of Frere is also Lucas 8 R Occupies out. The system of Front as many stenographic, founded on Gurney's shorthand, as that of Lucas was on Byrom's. Its distinctive feature, as compared with Lucas's, is that it is phonetic, the characters being intended to represent the simple sounds of the English language, rather than the letters; and each word is represented according to its promusand each word is represented according to its primary criation. The alphabet is composed of thirty-two characters, to each of which is attached a short description intended to fix more strongly in the memory of the learner the force of the character. The vowels are represented by simple dots, which, in different positions, represent the different vowels, and are divided into five long and five short. There are also twelve rules in verse for teaching the learner how to supply the omitted vowels correctly. Mr. Moon's to supply the omitted vowels correctly. Mr. Moon's system is certainly the best of the arbitrary systems. His alphabet consists of "the common letters simplified;" in other words, six of the Roman letters re-main unaltered; twelve others have parts left out, so as to be open to the touch; the rest are new and simple forms. It will be found, however, on examination, that the resemblance between Mr. Moon's letters and the Roman capitals is by no means so great as one might expect from his statement. "A letter," he says, "must consist of only one or two fines, to be felt by the thick finger of an adult." The words are all spelt at full length. Mr. Moon's system it, however, the most cambrous and expensive that has got been devised,—circumstances which are much again popularity. An ingenious "string alphabet," enabling the blind to read and write or correenabling the blind to read and write or correspond with each other, was invented some time ago by David Macheath and Robert Milne, two immetes of the Edinburgh Asylum, and has been found to answer its purpose remarkshy well. The different leaders of the alphabet are represented by different kinds and combinations of knots on a cord. They are distributed into seven classes, each class comprehending four letters, except the last, which has only two. The first, or A class, is distinguished by a large round knot; the second, or B class, by a lenst projecting from the line; the third, or I class, by a next of

da common knot orth, by the pharacteristic and a e mode of teaching rch from ised music is now little pracmount of re ing found, from their great strength of they are able to learn very long piece means of the ear alone. Embossed maps and bet are employed for teaching them geography; in addition to raised maps of the heavens, various remista, contrivances have been resorted to for g them acquainted with different branches of removing the knowledge. They are instructed in things by means of a board containing a series of atagonal holes, which receive pentagonal pins, representing the ten digits. By the use of such boards, they may be carried to any extent in arithmetical knowledge. They may be taught mathematics by means of a board full of small holes, with a few pina fitted to them, so as to represent certain letters; while, with a cord extended from the different points, tre formed the lines of the figure or diagram. stocess of Saunderson, Moyes, and others, sufficiently proves that blindness is no great impediment to a know-ledge of mathematics; indeed, according to some, the billind possess great advantages. In the various educad possess great advantages. In the various educa-al establishments for the blind, they are instructed in snady manual occupations, as in the making of basksts, mats, rugs, shoes, and such-like; for, in the words of Dr. Lettsom, "He who enables a blind person, without any excess of labour, to earn his own fivelehood, does him more real service than if he had pensioned him for life." For an account of the principal educational establishments for the blind throughout the country, see Knight's English Cyclo-patie—Arts and Sciences.

BEIFFACE, blind'-oj (Sax. blind), in Mil., any apporary construction to secure soldiers from the fire or the observation of an enemy. It consists prinand the operation of an energy.

The maily of beams of timber, against which fascines are said, which are covered with earth, turf, and raw less. When a fort is besieged, and it happens to be hides. ithout casemates for the protection of the soldiers, covered sheds of this kind are sometimes made, which erre them for a retreat, and a secure place in which they may lodge their provisions and ammunition. These are generally built by placing beams at an angle of 450 at short intervals from each other, against any of all as short intervals from each other, against any wall fit for the purpose, or the revertment of the coun-terseary, and covering them with fascines and earth. Semastines blindages are made by putting timbers against each other like the roof of a house, and covering m as before; and sometimes they are made by soming a small space with paliandes, and piling up then that roof of beams, earth, and sods upon them. ese delences can be made bomb-proof. Artillery-These desences can be made nomb-proof. Arthury-men working guns on the ramparts are protected from theodies and vertical fire by blindages, made by fixing pallandes on either side of every gun, and forming a black soof above it with the materials above-named: indage is open to the rear, and the gun can be if through the embrasure without hiedrance, is in the trenches, engaged in making the apcourse to a basicged fort, and exposed to a heavy fire in the name of the protected by placing a blindage as the tranch, constructed by frames of timber, and perspectionisty from the sides of the trench

proof a roof made in the usual way.

Coaf, a common name for those varieties of sining little or no bituminous matter, to burn blindly, from giving out neither

tenses, disd'-ing, a kind of punishment for-ministed upon perjurers, thieves, and adulterers, sily Christians were also frequently subjected to any performed in various ways. Sometimes vinegar, or a mixture of line and vinegar, was di into the eyes, often a cord was twisted nound

a slight percep the general outlines of bod while others are entirely dep are blind from birth; other of disease. In those that are are sometimes united to each of itself; sometimes a membrane or f sometimes the pupil is closed, or adverses; and sometimes the opening of the in the right place, so that the rays of it in the middle of the eye. It may also an defect of the optic nerve, or of the brain with it. Blindness may result from di nerve, or of the brain; or from an ab the humours or coats of the eye, interceptis of the light to the optic nerve. Among the lus, inflammation, congestion, softening that organ. The eve itself may be in mation, suppuration, or cancer; see tumours may form on the cornea, and transparency; the humours of the eye thick and turbid; or the opening of the destroyed. Blindness of the destroyed. Blindness often arises from debl optic nerve, occasioned frequently by long-overstraining of the sight. It is in this way tain kinds of occupations are so figurious to-and often cause blindness. Hence it is, tain films or occupations are so injurious at sue and often cause blindness. Hence it is, 100, the northern regions, where the country is long with saow, which reflects the sun's rays, and analy deserts of Africa, blindness is common age blindness is usually occasioned by a driften the humours of the eye, a thickening of the ecrystalline lens, or atrophy of the optic men blindness is an inability to see during the day ? light. Those who have been long impe-cells are often affected in this way. Week Night bles that state in which blindness comes on towards a This may be continued for some time; but at This may be continued for some time; but at ten the eyes become weak during the day size, and it minutes in amaurosis. Proceeding as blindless if from such a variety of causes, it is impossible full anything here regarding its treatment, which with found noticed in other parts of the work. (A AMAUROSIS, CATABACT, OFFURALMIA, EVER, STARR.)
BLIFTORESS, COLOUE. (See Colour SILVEDRISS)
REVENUESS. which will b

BLIFDRESS, COLOUR. (See Colour Silindress)
BLIFDRESS, a small reptile belonging to the fam.
Anguide. There is a great variety of the species in.
Burope, and one of the genus is well known in many
parts of Britain. It is perfectly hermiess, and in no
species are there any poison-fangs. Its testil are
very small, and, when irritated, it attempts to bits, but
a unable to pierce the skin. Its eyes are very small,
and in consequence it is believed to be blind by the
impount. Its tenant hance. The abilindress Russ in gnorant; hence the name. The blindworm liv ignorant; hence the name. The blindworm from he holes, in rocks, under stones, &c., and feed on five worms and insects. It will not tough them when hinds them dead. Its length varies from M to 15 inches, and its thickness is equal throughout its length. Its colour is silvery gray, with a black line along the back. The body is singularly brittle; the tail is easily broken off, but soon sprouts out at the half and at the end of a very is quite renewed. The blindand at the end of a year is quite renewed worm, or slow-worm as it is often called, re wed. Th during the winter, and casts its skin at the begins summer. It is ovoriviparous, and the number of varies from seven to twelve at a birth. One most interesting facts in connection with the bline is that it forms one of the connecting links bet lizards and serpents. The bones of the head of a b lizards and serpents. warm connect it with the linerd family; and sitt there are no external traces of limbs in the size there are the bones of the aboutley; the steries breastbone, and the pelvis, an existing in a

amiliary state.

Bluerza, Mic-ter (Ang.-Sax.), a pushele or ratery badder on the skin containing security branch by retaing the outliele, and may be occased.

## Blister

by a burn or other injury, or by a vesicatory. The term is also applied to the separation of the film or skin of plants, and to the marks on the surface of steel

that has undergone carbonization.

that has undergone coarbonization.

BLISTER, a medicinal agent, which, when applied to
the skin, causes the enticle to rise in small vesicles
filled with a second finid. The most ordinary blister
in use is made from the Spanish fly, Blister-fly, or
Canthagia. It is mixed with a definite proportion of
lard, and war, and used as a plaster. Blisters, however, are applied either in the form of a plaster, or
the liquid state, as may suit the convenience of the
operator. Their object is to draw away, by counterirritation, any inflammatory action from a part to operator. Their object is to draw away, by counter-irritation, any inflammatory action from a part to which direct remedies cannot be applied. Latterly they have been greatly used for the purpose of dis-persing glandular tumours, and also for indolent ulcers. Blisters made from cautharides, when applied for too great length of time, produce distressing affections of the urinary bladder. A piece of silver-paper, or gauze wot with vinegar, is often laid between the blister and the aking when it is made in the product of the serious of the serious of the serious of the serious description and the serious of the ser the akin when it is applied to children and thin-skinned people. Tincture of cantharides, croton oil, strong liquid ammonia, and mustard, are the blisters generally used. Mustard blisters are seldom kept on long enough to produce blisters. In every case a blister should not be kept long applied, and great cleanliness is necessary in dressing the part. Sores which have taken an unhealthy action have often been produced by keeping blisters too long upon children.

BESTERED STEEL is manufactured by heating bars

of malleable iron with cement-powder, in boxes made of fire-brick or earthenware. Cement-powder is composed of nine parts of charcoul, mixed with one part of common salt and wood ashes. A layer of this powder an inch thick is laid at the bottom of each box, der an anen thick is laid at the bottom of each box, and upon that a row of iron bars is placed; more coment-powder is laid over them, and then another row of bars, until the box is nearly filled. A layer of four or five inches of fine sand or loamy earth is placed upon the top of all. The box is then gradually heated to redness, and in about four days it is fully heated through, and the furnace attains its maximum heat. This temperature is maintained for two or three days, when the first test bar is drawn out. The heat is afterwards regulated according to the degree of hardness which may be required. The bars, in this process of comentation, remain eight days for soft steel, and nine to eleven days for harder purposes. When the bars are taken out of the box, their surfaces are found covered with blisters; hence the name. Whilst the iron is being heated with the cement-powder, it undergoes a chemical change. The malleable iron absorbs and combines with about 1½ per cent. of carbon; while and combines with about 13 per cent. of carbon; while a signal amount of carbon combines with a portion of oxygen in the iron, and forms carbonic oxide, which, in its escape from the metal, gives rise to bisters on the angines. Blistered steel is generally employed in the manufacture of hardware. When this process was the manufacture of intraware. When this process were discovered is not known; but at a very early period it was known that charcoal hardened from and gave it a more permanent and better cutting edge. Bistered steel is more fusible than malleable from; its texture is not fibrous, and when a bar is broken, it shows a close fine grain.
Berster-Fly, or Cantharis (Lytta resicatoria), an

insect common to the south of Europe. Its bedy is used for medicinal purposes, having the effect of raising a hister when applied to the skin. It has been observed that the efficacy of the insect increases according to

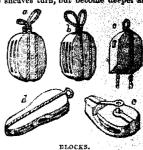
the hest of the country inhabited by it.

Buogs, blok (Fr. bloe; Ger. bloch), in Mar., an adaptation of the principle of the pulley, used in the rigging of thips. By means of blocks, sailors are enabled to raise the sails, and tighten or loosen ropes in different parts of the vessel, with greater facility. They are of various kinds, being called single, double, triple, &c., according to the number of sheaves contained in them. They also receive different names from some peculiarity in their shape; such as the "long-tackle block and the "clue-line block;" or or the prosition in the rigging in which they happen to the placed. There is a great difference in the size and capability of blocks used on hoard ship, and for various purposes in which such mechanical appliances

#### Block

are required. The component parts of a block are the shell, the sheave, the pin, and the strap. The shell is the piece of wood in which the sheave, or pulley, the piece of wood in which the sheare, or pulley, works: it is generally made of elm. Its common form is oval, somewhat resembling a spheroid, flattened at the sides, and perforated with one or more chambers, or mortises, according to the number of sheaves it is intended to receive, in a direction parallel to the sides. The sides of the shell are grooved in two places on either with the sides. side of the pin, to receive the rope by which the block is to be suspended. The grooves are shallow near the pin on which the sheaves turn, but become deeper as they approach the top and bottom of the

The shell. sheaves are circular pieces of lignum vitæ, of different thickness, according to the size of the rope that is intended to work over them; and the circumference is grooved, to prevent the rope from slipping away from



A hole is bored in the centre of the sheave, in which a piece of guu-metal, called the coak, is intro-duced and riveted to the wood; a hole is then made in the coak, exactly in the centre of the sheave, through which the pin by which it is secured in the shell, and on which it revolves, is introduced. The pin is reade of iren, polished as highly as possible, to prevent friction. The strap which surrounds the sides of the block is made of rope or iron, generally of the former; it is formed into a loop at the top of the block, to afford formed into a loop at the top of the block, to amore the means of auspending it in any required position. Blocks without sheaves, perforated with holes only to admit of the passage of a rope, are used in fastening the standing rigging and shrouds of a ship: they are technically called "dead-eyes." Great nicety is required in the construction of blocks, that they may work with facility : they were formerly made entirely by hand, and block-making was quite a separate branch of manufacture, or carried on by those who were engaged in making rests. During the present century. blocks for the navy have been made by machinery; for, in 1901, Mr. Brunel, who had turned his attention to the subject, produced the working model of a machine by which the various parts of a block could be made and fitted with far greater exactness than by hadd. The government, which clearly saw the importance of the invention in this case, caused machines to be erected at Portemouth, under the superintendence of Mr. Brunel, for the manufacture of blocks for the navy; and in the year 1808, after considerable delay, owing to the intricacy and delicate construction of the machinery, they were brought into thorough working order. Since that time, block-making machines have been put up at Chatham and in other dockyards. The first machine erected at Portsmouth, under the management of ten workmen, turned out about 500 blocks a day, at an average cost of about 7s. 6d. per block, effecting a saving of upwards of £20,000 per anoum to the country during the height of the war with France in the early part of the present century. Mr. Brunel received £20,000 for his invention. The method of operation by the muchines is as follows:—The clim is operation by the muchines is as follows:—The emins if irst cut into pieces, according to the size of the blocks required, by a straight saw, working horizontally; the slices thus formed are cut into rectangular parallelopipeds by the action of a vertical circular saw, called the ripping-saw. The piece of wood is then secured immovably to an iron table by the pressure of secured immovably to an iron table by the pressure of soriers, working horizontally, or parallel to the plane of the table, and at right angles to each other, are applied to it one forms the hole from side to side, through which the pin on which the sheave revolves is inserted; and the other makes a hole forming one extremity of the

chamber, or chambers in the case of double and triple consumer, or commorer in one case of double and triple blocks, with which the shall is to be pierced. When this has been done, the chambers themselves are rapidly out out by the action of a steelchisel, the motion of which, as well as that of the block, to enable it to receive the chiesle successive strokes, is regulated by very elaborate and ingenious mechanism. The corners of that the state of the block of the state of the block are then taken off by a circular saw, and it is afterwards brought to its oval shape by what is called the shaping machine: the grooves in the sides of the block are limity hollowed by the scoring machine, and the shell is then ready for the reception of the sheave, whole is fashioned by machinery of less complicated construction. In the illustration given upon the preconstruction. In the interaction given upon the pre-ceding page, are figured,—a, the double block; b, the trable block; c, the clue-line block; d, the long-tackle block; e, the sustch-block. In order to illustrate as fully as the limits of this work will allow, we shall now proceed to give a concise description of the several machines. 1. The straight cross-cutting saw is employed for cutting up into lengths the elm-trees of which the operates in almost the same manner as a carpenter's hand-saw, is only used for the largest trees. The tim-ber, previously rudely squared by the chip-are, is placed horizontally on a low bench, which is situated in the yard, and continued through a window into the sawnill. One end of the tree is brought through the window beneath the saw, which being let down and adjusted upon the place where the log is to be divided, cuts through it. The saw follows its course by its own weight alone, but the attendant can at any time lift up the saw from its work. 2. The cross-cutting circular sage is used for similar purposes as the former machine, but is employed for smaller trees. It is a circular saw, whose spindle is so mounted as to move in any direc tion parallel to itself; the saw all the while continuing in the same plane, and revolving rapidly upon its axis, outs the wood presented to it. By means of a handle, the attendant workman sets the saw against the side of the log, which it partially cuts through; the saw is then applied to the top of the log, next to the other side, and lastly beneath the log if necessary. In this way a saw of moderate diameter will be found sufficient to divide trees of very large dimensions. 3. The reciprocating ripping cut by the present one in the direction of the grain of the wood, first into two, three, or more pieces, in one direction, and afterwards in a direction perpendicular to the former, so as to bring the logs to the size required for the scantling of the proposed blocks. largest blocks are sawn or ripped up by this machine the smaller pieces being cut in the next machines, which are -4. The circular ripping-saw is a circular saw with teeth formed in its periphery similar to those of pit saw. It projects partly up through a bench, beneath which it is fixed to a spindle. The logs being set against the saw, are cut through the length of the grain, and divided into the proper scantling. The wood is guided to the saw by a large parallel ruler similar to those used by draughtsmen. The whole of the abovedescribed machines are used for converting the timber. The following series of engines are employed in shaping and fitting the cut timber into blocks .- 5. The boring michine. The blocks prepared by the foregoing saws are placed in the machine represented at Piate XIX. figs. 1 and 2, where they have two holes perforated through each in different directions; one through the centre, which is intended to receive a centre-pin from behave, and as many others as the block is intended to have sheaves in a direction perpendicular to the former. Figs. 1 and 2, Plate X 1X., are elevations of this machine; fig. 3, an end serew of one spindle fig. 4 is a detached view of another portion, and fig. 5, Plate X X., it is plan of the whole machine, the letters of reference being the same throughout. A B represent two anindies turned by their respective pulleys, a b, and minuted in a frame similar to the mandril of a lathe; both meaning that it is the state of the manufacture and the state of the manner of a carpenter's centrebit. The block marked X is held in an iron frame (E L L) by the end of a carew (F) being forced on the top of it, and the borers

heights from the frame, as is shown in fig. 6. These levers act upon pins fixed in the frames of the two spindles, which frames are fitted upon dovestiled levers act upon pins fired in the transes or the sequentiales, which frames are fitted upon devetailed aiders (I and K), so that they advance towards the block when the workman moves the handles II, at the ends of the levers in that direction; and the bores being in rapid motion by their pulleys, petietrate the wood very quickly. The proper situation for fixing the block that the borders may enter at the right points, is determined in this manner. The frame, E Z, as is shown on the plan, consists of three legs rising from the main frame, and uniting together to support the socket in which the sorew F sets. In this double leg three small screws (d e f) are injected, their heads forming a support, against which one side of the block is firmly held before the sorew F is firmly screwed down upon it, and holds it fast upon the head screwed down upon it, and holds it fast upon the head of a screw (K), which is the support of the block.

The borer C is made to penetrate the centre of the block by a gauge formed from a piece of item; shown separately at fig. 4. This has a groove in it, through which the screw K passes to fix it down to the frame, and a blade (R) standing up perpendicularly just beneath the border D, fig. 1, as shown there at R. One side of the block being pressed in contact with this blade, while the other side is held against the three screws, determines its situation, so that the borers will form the holes at the exact points required. In the same manner, by the gauge R being fixed at a greater or less distance from the screw K, the border C may be adjusted to bore exactly through the course of the side to which it is presented. The length of different sized blocks is accounted for by putting collets of dif-ferent thicknesses beneath the head of the screw K. which raises the support for the block to the proper-height. The slider I, on which the frame of the spindle A moves, is tirmly fixed upon the frame of the machine; but the slider K for the other spindle is formed on the top of a frame (SS), which has a motion on an axis, formed by the points of two scraws (TT) sing through stude projecting from the fer When double blocks are to be bored, the points of the stop-screws m and n are set at a proper distance asunder, and the frame being held first to one of them, bores a hole for one sheave, and being then turned over to the opposite stop-screw, forms a second hole at a proper distance from the first. The screw P has a lever (N) fixed upon the top of it, and loaded at the a lever (N) liked upon the top of it, and lossed as are ends with two weights, in the manner of the fly-press; and the block being held in its true position, the screw is forced smartly down upon it, and, by the momentum of the balls, presses very powerfully upon the wood.

The blocks being thus bored are subjected to the action of-6. the mortising-machine, which is exhibited at Plate XXI., in which a perspective view of this beautiful machine, borrowed from Sir David Brewster's Edinburgh Encyclopædia, is given. The mechanism is nut in motion by an endless strap passing round a drum at A, screwed to a fly-wheel (B), that regulates the movement. This drum turns an axis (D) on the extreme and of which is a crank; this has a long rod extending from it up to a joint at u, which connects it with a frame (E E) fitted between sliders (6.4), and guided by a cylindrical rod (F) sliding through a fixed collar supported by the framing. By this means the frame is moved up and down when the axis D revolves. To this frame the chisels are fastened, and operate upon the block fixed at G in a carriage (H) aliding horizontally in the frame of the machine. three screws the same size as the screw of the boring-machine, and each furnished with the same-sized ring at its end. This enters the impression made by the boring machine, so as to fix the block in its proper position when the screw is turned: this forces the other end of the block against a crossbar of the carother end of the block against a crossbar of the carriage, shown separately on the ground at Y. It has three steel circles or rings (f) fixed to it opposite the ends of the screw e. Each of these rings includes two smaller rings, also made with a sharp edge. Now the pressure of the screw e forces the block against these rings, so as to print their impression in the wood, and by this means the block is held quite fast in the decrease while undergoing the process of morthsing. The are presented to it by the action of two leavers  $(g \in k)$  risps while undergoing the process of mortising. The and k + k, which move on contropins fixed in the carriage has a large double-wormed corew (k) attached frame of the machine at g and h, but at different to it behind, and this is received through a nut; or

Blank

female surew, which is fitted to turn round in a fixed collar, supported by a bar extended across the frame of the machine. To this mut two wheels (g k) are fixed: the former is a large ratchet-wheel, the latter a cog-wheel, which has a smaller one gearing with it. This is fixed on the end of a long axis (k) on the extremity of which is a winch (r). When this is turned round by the attendant, the nut of the screw is turned at the same time, and the carriage moved along sittler backwards or forwards. This motion is only intended to adjust the carriage to the proper point of commencement. The gradual advancement of the block to each cut of the chief is produced by turning the ratchet-wheel g in this manner:—The axis female screw, which is fitted to turn round in a fixed turning the ratchet-wheel g in this manner:—The axis D has an eccentric circle (1) fixed upon it, which, as it revolves, acts upon a roller (K) fixed in one arm of a bent lever, which cannot be wholly seen in the view; the other end of this arm has a rod (m) jointed to it having a tooth in the middle, which engages the teeth of the ratchet-wheel and turns it round a tooth at a time as the rod reciprocates backwards and forwards. The extreme end of this rod rests upon a lever (n),—except when it rises up by being drawn over the sloping side of the tooth of the ratchet-wheel,—the centre of which is a pin fixed in the vertical column of the frame: it is held by a second lever (0), supported on a cock screwed on the frame. The opposite end of this lever is made so thick and heavy, that the weight of it is sufficient to raise up n and m so that the tooth of the latter will be too high to intercept the teeth of of the latter will be too high to intercept the teeth of the ratchet, wheel in its motion. The heavy end of the lever is kept up by a piece of metal fastened to the side of the carriage at p. The screws which fasten this pass through oblong grooves in it, so that it can be fixed at different parts along the length of the car-riage. By this means, when the carriage has advanced far as intended, the loaded end of the lever O tails off the piece p, and disengages the rod m from the ratchet wheel. The fly-wheel and drum, which turn the machine, are, as before mentioned, screwed to lat v, fixed perpendicular to its edge, so as to project gether; but they are fitted on a cyindicial part of; rather before it, being fitted in dovelui notches formed the laxis, so as to turn freely thereon when it is not in the sides of the chisels. These small acribers in the required to turn the axis D and work the machine, descent of the chisel cut or scribe two small clefts, A conical wheel (8), having a hollow axis or tube contrepiece, is fitted upon the axis D so as to slide freely andwise, but is conflued to revolve at the same by fillets inserted into it. The end of the tube of the wheel S is formed into a circular groove, which is embraced by a forked lever (L) centred in the opposite side of the frame. Now, by moving the end of L towards the fly-wheel, the conical wheel S is thrust forward and jammed into the inside of the drum A. This exactly fits the wheel, and the friction caused by the contact of the two conical surfaces is sufficient to work the machine. On the other hand, when the lever Lie pulled eway from the fly-wheel, the coulest wheel is drawn out from the rigger, and by that means the fly-wheel is detached from the axis, so as to revolve upon it freely without turning it; but to prevent any danger of the axis being turned by the friction of the fly-wheel upon it, the wheel S has another cone formed on the back of its rim, the basis of the two being con-joined. When the wheel is drawn back, this cone is ramined into a fixed ring (M) supported by the frame of the machine, so as to be fixed last, and prevent the exis from turning. The mortising-machine is used in the following manner:-The block brought from the boring machine has the print formed by the screw thereof applied to the end of one of the screws at e c. If one double or threefold sheave-block is to be mortised as shown in the figure, the centre serew alone is used to held it in; but if two single sheaves are to be fixed in, then only the outside screws are used, the centre one being left loose. By screwing it tight, the block is fixed between the double-circle prints By screwing it tight, before mentioned, on the bar Y, and stops are situated on the same bar. To guide the block to its proper position, which is, that the hole bered for the commenement of the sheave-hole shall be vertical, sup-pose the block fixed, the handle r is turned till the hole is brought beneath the sliding frame. The childs are now adjusted. These are long square bars onsens are now adjusted. These are long square bars of steel (TT), and are fastened to the frame by a clamp seen separately at X. This goes behind the cross-bar of the frame, and has two square holes through its

ends to receive the chisel T, and two screws to bits it fast in the square holes; at the same time that this keeps the chisels from slipping up and down, it fixes them isst to the frame EE, by drawing the chisels forcibly against the cross-bars by means of the cleanps behind them. The two screws of each clamp being slackened, the chisels are put exactly over the holes which are to become sheave-holes, and acrowed fast. The machine is now put in motion by depressing the handle P. This is at the end of a lever, the fulcrum of which is a pin fixed in the column of the frame at s, and a short arm gives action to the end of the lever L before described, so as to put the machine in motion. At the first descent of the chisels they cut down through the whole depth of the holes previously boxed, so as to give them a flat side when they rise up. The ecceptric circle I, moving the bent lover and rod a, turns the ratchet-wheel round on both, and advances the block a very minute quantity towards the fir-wheel, so that the chisel in descending outs a fresh space, and in ascending the block advances. In this manuer it pro-ceeds with a most astonishing rapidity through the whole length of the intended sheave-hole. At this time the loaded end of the lever o drops off the piece previously adjusted, and raises the rod m, so that the further advance of the block is prevented. When the further advance of the block is prevented. When the boy who attends the machine observes this, he raises the handle P. This stops the machine, as before stated. and the boy takes care to stop it when the chisels are at the highest point, which he effects by a very dex-terous movement. The finished block is now removed and a fresh one put in; the handle r is screwed back to bring the block to the proper point, and the machine starts and proceeds as before. The backs of the chisele have a small piece of steel (t) fixed to them, which thrusts out the chips which they cut; otherwise those would accumulate and wedge up the hole, so as to obstruct the chisel most materially by filling up the space behind it, It has also two small cutters called scribers which include the width of the chip, which will be cut out by the chisel in the succeeding stroke. ingenious device the mortise cut in this machine has its sides as smooth as if they were made by a plane. The back of the chisel is rounded to conform to the hole bored in the boring-machine. To adapt the mortising-machine for different-sized blocks, the crosshar Y in the back of the carriage against which the blocks are pressed, can be fixed by notches cut in the frame at one inch seunder, so as to hold all blocks of different lengths having an inch difference in each. The stops above mentioned to ascertain the position of the block can be fixed upon the cross-bar at any point, either as to height or position sidewise, in the following manner:-The piece of iron W (see the separate view), with a groove through it, carries two vertical pieces (xx), at the upper and lower end of which is a knob: these will place the sides of the blocks applied against them truly vertical. Two small pillars (n,n) are fixed to the cross-bar of the carriage. They have a piece sliding upon them, which can be fixed at any height by screws in the front of the carriage; so that when one is set in the position for a block to be held by one screw, the other will be at the proper place for the other screw. By these means the carriage can be adapted to receive a block of any dimensions, and can guide it to its proper position against the print in the cross-bar. The frame E may have any number of chisels fixed to it, corresponding to the number of mortises intended to be cut. 7. The corner saw cuts off the angles of the parallelopipedon which have passed through the foregoing machines. This is a circular saw, shown at figs. 8 and 9 of Plate XX., where fig. 7 is a plan of the bench, fig. 8 a front eleva-tion, and fig. 9 an end elevation. In these A is a cir-cular saw fixed upon a spindle (a), mounted in an iron trame (B) like a lathe spindle, and turned by a hand-round the pulley C. The block is placed upon an inclined table (D), which presents it to the saw, so se to remove a proper portion of the angle, and prepare it for the shaping-engine, which forms the exterior surface of the block. The block lodges against the

Block ledge (E) of the table, which guides it whilst it is sawn. It is accommodated for blocks of different dimensawn. It is accommodated in blocks of direct dubers sions by placing wooden rulers of proper thicknesses against the ledge B to bring it near to the saw. In one of these machines the ledge E is fitted with con-necting bers in the style of a parallel ruler, so that it neuting pars in the says of a parametric ruler, so that it can be fixed at any distance from the saw, but always parallel thereto. The saw is fixed in a chuck, which is attached to a spindle for sawing, so that it can be quickly removed to sharpen the saw. The limits of this work preclude our giving in full an account of all the operations of these magnificent pieces of mechanism; our readers are therefore re-ferred to Sir D. Brewster's work already mentioned, where will be found a lengthy description, accompanied by some excellent perspective drawings of the machines. 8. The shaping engine, which consists of a double wheel, and contains ten blocks at one time. When these are put in motion, the external faces of the blocks pass under the gouges, which shape them into the required form. 9. The knowing enque, the last machine of this series, is employed to form the score round the block, for the reception of the strap or rope by which it is suspended in the rigging of the ship. The score is a groove deep enough at the ends of the block to receive one half of the rope, but is diminished to nothing where it crosses the pin of the block. With this operation the preparation of the shells of the block is terminated, after which they are trimmed, polished, and finished by hand. 10. The straight saw, for cutting the lignum vite, is a machine somewhat similar to that already described for cutting the elm logs. It is only used to cut out the largest sheaves cause the circular saw to be next mentioned would not act freely through a large and hard substance.
11. The circular saw for converting the lignum vita. is only used for the smaller sheaves. The revolving saw is applied to the outside of the tree, which at the same time revolves upon its own axis, so as to present every part of its circumference to the action of the saw. By this means the saw will cut a tree of nearly as great a diameter as itself. 12. The crown saw works similarly to a trepan, having a centrebit on its axis. The piece of wood being fixed before this contrivance, the saw outs out the circle, and at the same time bores a hole in the centre. 13. The couking engine. This machine prepares the sheave for the reception of a bell-metal bush, or centre-piece, called the coak, one of which is fitted into each side of the sheave to surround its centre pin and avoid wearing. 14. The delling machine bush as a machine bush as the coars. drilling-machine bears a great resemblance to an ordinary turning lathe, which is employed to perforate the three semicircular projections of the coaks, at the same time drilling through both the coaks and the wood of the sheave. 15. The riveting-hummers are two small tilt hammers used for the purpose of riveting the pine which hold the gua-metal coaks into the hole in the sheaves bored by the coaking engine.

16. The broaching engine, where the sheave is fixed to a vertical revolving axis, the borer being brought down into the hole in the centre of the coaked sheave, and broached out to a perfect cylinder. 17. The fuceturning lathe is a lathe furnished with a sliding rest, in which the two faces of the sheave are turned perfectly smooth, and the circumference made truly regular. With this operation is concluded the finishing of the blocks, stells, and sheaves. The iron pins for them have next to be described. 18. The tarning lathe, where the iron pins are turned with a slide rest. 19. The polishing engine consists of three steel dies fixed in a box and regulated by strong screws, to form a triangular opening of any required dimensions. The pin being drawn through these dies, and turned round at the same time, receives a most violent pressure and at the same time, receives a most violent pressure and friction, which burnishes and polishes the whole of its surface in the most complete manner. The dies are of course immersed in oil, to avoid the heating of the pin or dies from friction. 20 is an apparatus for boring large holes in any position, and is used for blocks of a size beyond that for which the regular machines are calculated; some of these blocks being as large as fifth family have in hearth with four increase. 21 The size beyond that for which the regular machines are calculated; some of these blocks being as large as fifty-four inches in length, with four sincaves. 21. The machine for making dead eyes is a most ingenious and to the time of Brunel's invention, block-making by complete machine, whereby the whole of the article is complete machine. The pieces of wood, being sawn to Brewster's Edinburgh Encyclopædia; Eng. Cyclopædia 295

the size, have the holes bored through them in the toe size, have the nones nored through them an analysis boring-machine, for the reception of the rope which is to be reeved through them. The angles are next removed by the corner saw. The pieces of wood are then placed in this machine, which shapes them, and cuts out the score round them.

Mr. Tombinson, in his Cyclopadiu of the Useful Arts, states that "the number of machines employed in making the blocks is forty-four. These are divided into three sets, so that three sets of blocks, of different sizes, may be proceeding in all their stages at the same time, although in some of these stages one machine operates at the same time upon two, or even ten blocks. The different blocks made by these machines are as follows: "Which blocks made by these machines are as follows :- Thick blocks, four varieties, - single sheares, double sheares, treble, and fourfold. The sizes of each variety are from four inches to twenty-eight inches in length; but only the first three varieties are wholly made by the machine, the fourfold being chiefly made by band. But their sheaves are entirely formed by the machines.

These make about		izes
but with narrow sheaves: these are from six to twenty-six inches in length.	48	69
Clue-garnet and clue-line blocks, of pe- culiar construction, introduced by the inventor of this machinery		
Sister-blocks	20	29
Top-sail sheet-blooks Fiddle, or viol blocks Jack-block	20 24	**
Jack-block	20	,,
Total	214	

The number of block-shells of different sizes made by each machine is thus stated :- The first set of machines makes blocks from four to seven inches in length at the rate of seven hundred per day. These have wooden pins. The second set makes blocks from eight wooden pins. The second set makes blocks from the rate of five hundred and twenty per day. The third set makes blocks from eleven to eighteen inches in length, with the pairs at the rate of two hundred per day.—Total, from pins, at the rate of two hundred per day.—Total, fourteen hundred and twenty per day. This collection of machines is one of the most ingenious and complete ever invented for forming articles in wood; so that not only blocks, but other articles in wood, can be produced, the machines performing most of the prac-tical operations of carpentry with the utmost accuracy and dispatch. The largest timber can be converted and sawed up into any scantling by several circular and reciprocating saws adapted to various purposes. Some of the operations performed by the smaller machines are boring, mortising, turning in wood and iron, riveting, drilling, broaching, burnishing iron pins, &c., operations which were formerly supposed to be chiefly or entirely dependent on the skill and dexterity of the workman. These machines are set in motion by a steam-engine of 32-horse power, which is also used for various other purposes in the dock-yard. . . . Brunel was engaged in completing this system from September, S02, to June, 1808, his allow-ance during that time being one guines a day. Such was the importance attached by the Government to this invention, that a complete set of duplicate machinery was erected in the dockyard at Chatham, and kept in constant readiness for action, in case of any accident to the machinery at Portsmouth. Hitherto, however, the duplicate machinery has not been wanted. The muchinery was constructed by Messrs. Mandsley, of the Westminster Road, London. The framing of The machinery was constructed by the Westminster Road, London. The framing of the machinery was of cast fron, and those parts extended and motion were of cast steel." posed to violent and rapid motion were of cast steel."
The construction of blocks, which at first sight appears a very simple operation, which any workman in wood could perform with facility and accuracy, is in reality a very nice bit of mechanical work. The parts must all be fashioned and fitted together with the greatest

-Arts and Sciences; Tomlinson's Oyclopædia of the Useful Arts.

BLOCK, in Com., a heavy piece of timber.

Brock in maritime langua

BLOCK AND BLOCK in maritime language is used when hauling any tackle, halyard, or the like, to which two blocks belong, the two meet and touch, so that they can be hauled no farther.

BLOCK-BATTERY in the military art denotes a wooden battery on four wheels, movable from place to place, whereby to fire en barbe, or over the parapet. The term is sometimes used in galleries and essements. PLOCK-BRUSH, in Her., a hunch of kneeholm, or

bastard myrtle, formerly used by butchers to clean their blocks. It forms a part of the armorial bearings of the Butchers' company.

BLOCK-CARRIAGE, in Artillery, is a carriage used for the conveyance of morters and their beds from

for the conveyance of mortars and their beds from one place to another.

BLOCKEDE, blok-aid', in Mar., the close observation of any port or harbour on the scaboard of an enemy's country, to prevent the entrance and egress of vessels engaged in commerce, or an attempt to relieve the beleaguered town by the introduction of men or provisions. It is effected by stationing menof-war at a short distance outside the blockaded port. -In Mil., towns and forts that are difficult of investment and regular approach by trenches, through being situate in a communding position on a hill or eminence, are blockaded by being surrounded with a cordon of works or redoubts established on the surrounding heights, at the distance of half a mile or more from each other, according to circumstances and the nature of the country. The great object in both cases is to starve the inhabitants and garrison into submission, and thus effect the reduction of the place besieged. Sometimes a blockade must be carried on by sea and land at the same time to render it complete and effiis an at the same time to render it complete and effi-cient; but the term is more particularly applicable to the investment or watching of a port by ships of war. The following is the definition of the word blockade, in the words of Sir William Scott, afterwards Lord Stowell:—"A blockade is a sort of circumvaliation round a place, by which all foreign connection and currencyndence is as far as human connection. correspondence is, as far as human power can effect it, to be entirely cut off." A summary of the whiel A summary of the blief points in international law affecting the relative rights of neutrals and belligereuts in the case of the blockade of the coast of one belligerent power by another, will be found below

be found below.

BLOCKADE, LAW OF.—The law of blockade, as affecting the rights of neutral states which are in any way connected with that belligerent power whose ports are closed by another that has declared war against it, is one of the most intricate subjects in international law, owing to the difficulty of determining on the one hand to what extent belligerents shall be restricted in the exercise of the rights of war as far as neutrals are concerned, and, on the other, to what limits neutrals may proceed, in their relations with the country whose ports are blockaded, without bringing themselves under the power of its adversary. A declaration of war made by one power against another, accompanied by an official notification of the blockade of the ports of one or both of the belligerents, is always attended with serious injury to the commercial interattended with serious injuty to the commercial inter-course between neutral states and the power or powers whose ports are closed. As soon as a blockade is noti-fied, all intercourse between the power whose ports are blockaded and neutral states is at once stopped; but a certain time is given to allow ships belonging to neutral states to clear out of the blockaded ports with the cargoes they have already taken on board, and for the merchant vessels of that power to return home prior to the date from which a strict observance of the blockade commences. For any power to take steps to render intercourse between an enemy's ports and neutral states impracticable, is perfectly consonant with justice, even though such an act be attended with loss and detriment to the commerce of such states: and it is equally fair and right to consider any vessel that attempts to enter an enemy's port, after notice of the blockade has been given, in the light of an enemy a ship, and to treat it accordingly; or to pre-

may be engaged in carrying in munitions of war and provisions; and the power insisting on freedom of intercourse be giving moral support, at least, to the enemy's cause; thus frustrating the designs of the blockading power to a certain extent, and perhaps thwarting a more speedy settlement of the quarrel that might ensue if the blockade were strictly enforced and observed by all parties, whether directly or indirectly concerned. That a blockade may be really effective, whether the a sufficient number of shine surrounding may be engaged in carrying in munitions of war and there must be a sufficient number of ships surrounding the port to render the ingress and egress of vessels either imprecticable, or attended with danger of capture or destruction. It is not sufficient for one power to say that it has notified the blockade of the ports of another power, and to leave those ports unguarded by men-of-war; if so, the right and privilege of capturing any vessel which touches, or even has touched, at any port thus nominally blockaded, which a beliggerent closing the ports of another power asserts, would be unlimited and insupportable. Such a blockade would be merely nominal, and any neutral power would be justified in taking no notice whatever of a mere notification, unless supported by the means of carrying the same into effect by an armed force. An effective blockade depends, therefore, on the actual fact, ac-companied by a proper notification of the same. A mere notification, without armed vessels stationed at the ports which are closed, has been already stated to be useless. There are, then, two kinds of blockade: one, without notification, which ceases on the withdrawal of the ships from the blockaded port, unless caused by accident or a mere change of wind, obliging the blockading vessels to abandon their position for a while; and another, when notification of a blockade has been given to neutral states, and supported by the investment of the enemy's ports by vessels of war. In the latter case, all states are obliged to respect the blockade until an official report of the raising of the same has been received; and this should be made by the blockating power immediately after the cessation of hostilities, although no means exist by which any power may be called to account for neglecting this observance. Vessels belonging to neutral states, that happen to be in any port with their cargoes already on board before notification of the blockade has been made, are at liberty to quit the harbour, even after notification has taken place, under certain restrictions ; but they must not take in any additional cargo, nor is it admissible for the master to make any purchases at that port, except what may be absolutely necessary for the maintenance of himself and his crew. After notification of a blockade has been made, it is manifestly a breach of blockade for a vessel to attempt to enter or come out from my closed port. Any vessel may be lawfully captured which is approaching the harbour with the view of running the blockade at some convenient opportunity; and some assert that a vessel may even be taken and condemned which has just set sail from a neutral port with the intention of entering a port of the enemy's, although it would be a difficult matter to prove that such was the intention of the master, as well as the owners of the ship and cargo, unless the belligerent power effecting the capture had managed to institute a system of espionage at the port from which the vessel had sailed, and at the other principal ports of the neutral state to which it belonged. When any neutral vessel has managed to run the blockade, it is liable to capture, until it has reached its own port, or any other in which it may take shelter; but it is still liable to be taken on again leaving that port, until the cessation of hostilities has caused the blockade to be raised. When a neutral ship is captured in an attempt to violate a blockade, or after having done so, it must be taken by the captor to the naving done so, it must be taken by the captor to see nearest harbour in which a prize-court is sitting, to determine the legality or ulegality of the capture, as the case may be. If the capture prove to be illegally made, the owners can claim an indemnity for determined in the capture of t tion, and any injury done to the cargo; but if it can be satisfactorily proved that a sufficient blockade of the enemy's ports exists, and that some actual breach of the bockade has taken place, with the knowledge and consistence of the master and owners of the ship and cargo, the vessel and its with the other power from holding direct intercourse owners of the ship and cargo, the vessel and its with that whose ports are closed, as the neutral vessel contents are formally condemned and sold for the

## Blockhouse

benefit of the captors; if, however, it can be proved that the master of the ship is alone implicated in the breach of the blookade, while the owners of the cargo with which his vessel is freighted are not in any ap privy to or cognizant of the offence, the cargo is given prity to or cognizant of the onence, the cargo is given up; while, on the centrary, if the owners of the cargo can be proved to be the only parties, that are guilty, and that the master or owners of the vessel have not intentionally violuted the blockade, the cargo alone is taken and the vessel restored. It is perfectly lawful for neutral states to carry on intercourse with a block-aded port by any inland means of communication, and their vessels may land their cargoes at the nearest port belonging to some neighbouring power, and transmit the goods overland. The law of blockade was carried to its highest pitch, and enforced with the utmost rigour and severity, during the struggle between France and Great Britain, in the early part of the present century. The emperor Napoleon issued his present century. The emperor Napoleon issued his famous decrees of Berlin and Milan in 1806 and 1807. by the former of which all vessels trading to British ports were declared subject to capture; and, by a supplementary decree, that any vessels whatever, not possessing certificates from the French consuls at the ports from which they sailed, that no part whatever of the cargo which they had on board was British; and durther, all countries were prohibited from trading in British productions or manufactures of any kind whatever. The English government retaliated by the "orders in council," 1807—1809; but this restrictive policy with regard to neutrals proved so injurious to the trade of this country, that it was subsequently abandoned, in compliance with the representations of the merchants of London and the large mercantile towns, who had petitioned for a repeal of these grders. The present acceptation of the law of blockade may be considered to be founded on the clear and lucid judgments delivered during this period, and up to the close of the war in 1815, by Lord Stowell, then Sir William Scott, in his capacity as president of the High Court of Admiralty. A statement of the laws affecting the right of belligerents to search vessels belonging to the right of heligerents to search vessels belonging to neutral states suspected of enrying "contraband of war" will be found elsewhere. (See Slanca, Right or.)—Ref. Wheaton's Elements of International Law; Hazlitt and Roche's Manual of the Luw of Maritime Warfure; English Cyclopadia—Arts and Sciences. BLOCKHOUSE, thick-hous, a work of defence, formed principally, as the name implies, of logs of timber. It

may be built by itself, in which case it may be looked on as a small independent fort; or it may be situated in the interior of field-works, when it becomes a retrenchment, used for the same purposes as erections of a somewhat similar nature called blindages. (See BLINDAGE.) The blockhouse is generally built in countries where there is plenty of timber, and in situations where light artillery cannot be brought to bear directly upon it. It is for the most part of one story only, and rectangular in form. Strong timbers are fixed in the ground perpendicularly at the angles of the blockhouse, to which the sides are attached, formed of horizontal logs strongly fustened tegether, and pierced at a convenient height with loopholes, from which a at a convenient height with loopholes, from which a fire of musketry can be kept up against assailants. It is generally surrounded with a ditch, the earth taken from which is piled against the lower part of the building, and used to form the roef, being heaped on an interior covering of logs and faggots. The ditch is useful in preventing the close approach of the enemy to set fire to the blockhouse. The entrance, if in the side is notested by blindages, but it is generally made side, is protected by blindages; but it is generally made in the roof, and entrance and egress obtained by means of a ladder. If an upper story be added to the block house, it is usually built so that its four sides overlook the angles of the lower story, being parallel to its diagonals. This enables the defenders to direct their fire against any one approaching the angles of the lower story, which are necessarily out of the line of fire directed from its faces. When the roof is intended to resist artillery and to be shell-proof, it must be made of earth well rammed together, at least four feet in thickness. The AmerRan backwoodsmen and trappers have found these log-forts of great service in their conflicts with the Indians; and they are very skillul in constructing them. Sometimes the blockhouse, in the roof, and entrance and egress obtained by means ful in constructing them. Sometimes the blockhouse,

## Blood

which, in its simplest form, is about eighteen or twenty feet square, assumes a more important character, and is erected for the purpose of resisting artillery. In this case it is built with re-entering angles, which permit a flanking fire of musketry to be kept up to defend the sides of the work, and the walls are made of a double row of upright timbers about two or three feet apart, with the intervening space filled with earth.

BLOCK-SHIP, in Mar., an old ship which, having become useless as a sea-going craft, has been utilized as a defence for great ports or arsenals. The many and rapid improvements that have taken place in naval architecture have caused a large number of English war-vessels to be unavailable otherwise than as block-ships.

BLOCK TIM.—This term is applied very erroneously to the better qualities of tinned iron; but it really means the impure quality of metallic tin, the pure kind

means the impure quarty of metalic tin, the pure kind being called grain-tin.

Bloon, blud (Sex. blod; Germ. blut; Lat. sanguis), a red fluid circulating through the beart, arteries, and veins of animal bodies, serving for the neurishment of all their parts, and the support of life. This nutritive fluid, called scientifically the liquor sanguinis, consists firstly of water, holding, in a dissolved condition, fibrine, albumen, potassium, and sodium, together with phos abutier, potential and solutin, ogether with pros-phorie acid and other substances; secondly of cor-puscles, or globules, which float in the liquor sanguinis. When drawn from the body, the blood undergoes a remarkable change. By degrees it gelatinizes, and forms spontaneously coagulum and serum. Coagulum consists of the fibrine and the corpuscles; serum, of consists of the north and the corpusates; section of water, albumen, and the various saline matters. The corpuscles are of two kinds—red and white, the red being the more numerous. In man, a red corpuscle varies in size from which of an inch to what of an inch. The discovery of the globules of the blood is due to Leuwenhoeck and Malpighi, whose researches were made soon after the microscope was invented. Blood is termed arterial or venous, according to the vessel in which it circulates. Arterial blood is a florid red, with a stronger odour and less specific gravity than the remous fluid. Venous blood is of a cark purple. The scarlet, or arterial blood, which is one degree warmer than venous blood, owes its colour to its undergoing than venous bood, ower is conour to its undergoing contact with atmospheric air in the lungs; it circulates in the pulmonary veius, the left cavities of the heart, and the arteries, by which it is distributed to the different organs throughout the body. The dark purple blood circulates in the veius, in the right cavities of the heart, and the lungs. (See CIRCULATION OF THE BLOOD, RESPIRATION.) There is, again, a difference between arterial and venous blood in respect to the gases which they contain: the first holds a supply of oxygen, the second is rendered impure by the carbonic acid with which it is loaded. (See ARTERY and VEIX.)
Blood is the product of the elaboration of chyle; it
acquires all its nutritive and life-giving qualities
in respiration. By means of the arterial vessels, it penetrates to all the organs, distributing nutrition to penetrates to at the organs, distributing intertain to every organic tissue. It is, moreover, the principal source of animal heat; from it, also, the secretive organs derive their various products, such as saliva, bile, urine, &c. The average quantity of blood in an adult man has been calculated at 28 lbs. or pints. It has been shown that the composition of the blood undergoes a change in various diseases; and, after repeated bleedings, the number of corpuscles becomes repeated bleedings, the number of corpuscies becomes permanently diminished. The colour, as well as the composition of the blood, varies in different sections of the animal kingdom: red in the Vertebrates and Annelides, it is white and transparent as water in Insects and Crustaceans; bluish-white in Mollusca, yellowish in Holothurians and some other Invertebrates. brates. This difference in colour arises from the corpuscles, which are red in some cases, and in others white or straw-coloured, or bluish-white. The temwhite or straw-coloured, or bluish-white. The temperature of the blood of various animals, according to s of Rudolphi and Tiedemann, is-

researches of readerpas and	Der. of Fahrenheit.
Great Titmouse	111 25
Swallow. Ducks and Geese	111.25
Ducks and Geese	106 to 111
O Ifoo	
Pigeon	106 to 109

#### Blood

Gull	100
Bat	108
Squirrel	105
Ox	104
Ape	103
Dog	101
Cat 98 to	103
Elephant	99
Horse	
Man	98

The chemical constituents of blood, when in a healthy condition, are,—albumen, fibrin, hæmatin or colour-ing matter, oleio, stearic, lactic, phosphoric, sul-phuric, and bydrochloric acids, in combination



monia, lime, magnesia, and a small portion of phosphorized fat. The blood also contains oxygen, nitrogen, and car-bonic acid. In considering the chemical constitution of the blood, it may be regarded as consisting of two parts,the liquor sanguinis, and the blood corpuscles

with sodn, potash, am-

posed of serum, holding a small quantry of fibrin in solution. The following table of the composition of these two parts of the blood is based on the analyses of Schmidt and Lehmann, and is a modification of the topological willows. that quoted in Miller's Elements of Chemistry, vol. iii. D. 689 :-

> Specific gravity of blood corpuscles, 1 0885. Composition of Blood Corpuscles.

Water	388
Solid constituents—	
Hæmatin	
Globulin and cell membrane	292-29
Fat	2:34
Extractive matter	2.60
Chlorine	1.636
Sulphurie acid	0.066
Phosphoric acid	1.134
Potassium	3.328
Sodium	1.052
Oxygen	0.667
Phosphate of lime	0:114
Phosphate of magnesia	0.073
Specific gravity of liquor sanguinis, 1	028.

Specific	gravity of liquor sanguinis, 1"	028.
Cox	nonition of Limor Supprises	

Composition of Light Sanguines.	
Water	02:90
Fibrin	4.05
Albumen	78.54
Fat	1.73
Extractive matters	3.94
Chlorine	3.641
Sulphuric acid	0.112
Phosphoric acid	0.191
Potassium	0.323
Sedium.	3.347
Oxygen	0.403
Phosphate of lime	0.311
Phosphate of magnesia	0.222

Taking the blood as a whole, Liebig gives its component parts as follows :-

Water	80	
Solid matter	20	

The solid matter, on being incinerated, gives 14 to 14 per cent. of ash, which consists of one-half sea-salt, one-tenth of peroxide of iron, and the rest of lime, magnesis, potash, soda, phosphoric acid, and carbonic acid. (For a description of the chemical substances obtained from blood, see HEMATIS, HEMATODINS, and GLOBULIN.) — Ref. Todd's Cyclopadia of Anatomy and Physiology; English Cyclopadia—Arts and Sciences.

Broom (in Manf.) .- The uses of blood in manufactures an principally as a manure (see Manures); The number of knights was restricted to twenty, its value, in this instance, consisting in the amount of i besides the grand master.

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Sugar Acres

## Blood of Our Saviour

phosphates contained in 4; and as a cheap source of albumen for calico-printing. An effort has been made by M. Brocchierri to utilize the nutritive portions of the blood of animals, by reducing it to a dried and concentrated state. Combined with flour, the crassaconcentrated state. Combined with flour, the crassa-mentum, or clot of blood, is made into light cakes and mentum, or cot of mood, is made into ign cases and biscuits, and, by the addition of sugar, into delicious bon-bons. The larger masses, preserved without flour or sugar, form the basis of soup of a very nutritious quality. Blood is also employed, in conjunction with other animal substances, in the manufacture of prussiste

of potash. (See Potasu, Paussiate of.)
Blood-Baptism.—In the early Church, when any one suffered marty room without having been baptized, he was considered to have been blood-haptized; and hence martyrdom was termed blood-baptism. When hence martyrdom was termed blood-baptism. baptism was regarded as essential to salvation, mar-tyrdom was also considered as giving a title to heaven,

from Mat. x. 39, and similar passages.

BLOOP, CORRUPTION OF. (New ATTAINDER.)

BLOOP, EATING OF.—Under the Old Testament
dispensation, the cating of blood was forbidden to the Jews; and in apostone times the gentiles are ex-horted to abstain "from things strangled and from blood" (Acts xv. 20); but this last seems to have been advised in order to meet the prejudices of the Jews of that period, who were contending that the gentiles should be commanded to keep the law of Moses. some centuries after, the Christian church continued to abstain from blood; and when it was alleged against them that they were in the way of drinking luman blood, they replied that it was not lawful for them to drink even the blood of animats. After the 4th century, however, the injunction came to be considered as merely of a temporary character, and so ceased to be binding.

BLOOD-FLOWER. (See HAMANTRUS.) BLOOD-HORSE. (See HORSE.)

BLOOD-HORSE. (See HORSE.) BLOODHOUSD, blad hound (blood; and Dan. hund, hound) (Canis sanguinarius), a dog of such exquisite and pecuhar scent as to be able to follow the trail, for many miles, of any body bearing about it traces of tresh-shed blood. The genuine bloodhounds are large, strong, and broad-chested; the upper lip large and pendulous; the general colour a deep tan, marked with



BLOODHOUND.

a spot of black over each eye. Formerly this creature was used in recovering escaped criminals. Such matters, at least in England, have become traditions of a past age, and the instincts of the bloodhound have been turned to the more humans and profitable business of the chase.

BLOOD OF OUR SAVIOUR, was an order of knighthood instituted in Mantua, by Duke Vincent Gonçaga, in 1603, on the occasion of the marriage of his son with a daughter of the duke of Savoy. The name was daughter of the duke of Savoy. The name was derived from the belief that the church of St. Andrew, in Mantan, contained drops of our Saviour's blood

### Blood-root

BLOOD-ROOT. (See SANGUINARIA and HEMODO-BACER.

BLOODSTONE, blad'-stone, a variety of chalcedony, of a fine dark-green colour, variegated with small bright-red spots; whence its name. It is also called Astistrope. Being very hard and compact, it is highly valued by seal-engravers, the devices engraved upon it being much sharper and finer than those engraved on other stones of a similar kind. Hæmatite, a brownred mineral, consisting of sesquioxide of iron, is some-times erroneously called bloodstone.

BLOOM, bloom (Sax. bloma, a mass or lump), a mass of iron that has undergone the first hammering, called the blomery. After this process it requires many more hammerings or rollings to render it suitable for

the use of the smith.

Rhoos, in Psint, is a term applied to an appearance upon pictures which resembles the bloom upon the peach or plum; whence the name. It is probably due to moisture in the varnish used in the painting. and may be got rid of by hot camphine being sponged over the surface of the work, afterwards placing the painting in the sunshine to dry.

BLOOMARY, bloom'-a-re, the name by which the old

iron furnace was called.

BLOOMERISM, bloom'-er-ism .- In the year 1849, Mrs. Ann Bloomer, a lady who had been an active promoter of the "Woman's Rights movement" in America, appeared in New York dressed in a novel and fancium costume. It partly resembled the male attire, and consisted of a jacket with loose sieeres, a skirt which descended a little below the knee, and a pair of Turkish tronsers. The grounds upon which Mrs. Bloomer advocated this alteration in ladies' dress were, that since they had resolved to take their places in the world as fellow-workers with men, they ought not to wear a dress that prevented free muscular action. Only a small number of ladies followed the example of Mrs. Bloomer, and those only of the most strong-minded class. Those who were timid and prudent declined to brave the unpopularity and ridicule which the dress brought upon its adherents. Nevertheless, the name of bloomerism attached itself to the principles which actuated all who belonged to the Woman's Rights movement. The first convention of this move-ment was held in New York, about a year after the costume appeared, under the presidency of Mrs. Lucretia Mott. It had for its object the more liberal education of females, advocated their being brought up to trades and professions, and their rights to the up to traces and professions, and their rights to the social and political privileges possessed by the other sex. In New York, the Sibyl, a monthly journal, is still devoted to the advocacy of a reform in ladical dress; and the editorss, a married lady, and several contributors, wear a medification of the Bloomer costinuous traces and the side of the s tume. It is very awkward-looking and ungraceful.

BLOUSE, blows (Fr.), a loose sack-like frock, made of coarse partially-blenched linen, and worn as an overgarment by workmon and peasants in France. The piece of attire called in England the "smock-frock" bears a close resemblance to the blouse. It is princibears a close resemblance to the blouse. It is principally worn by waggoners, brewers' draymen, and farm labourers. The butchers of England, the south of Scotland, France, and Germany, all wear the blue blouse; France, however, is the country where it is most universally worn, as, indeed, France is the country where it was first adopted; for it is nothing else than a medification of the suyon of the Gauls. Under the empire of the first Napoleon, the rural and citizen militia wore the blouse. The French workmen wear it of different colours, but a white blouse is always put on as Sunday dress. A kind of blouse, made of better material than the English smock-freek or continental blouse, is often adopted by tourists.

Blow-Fly,blo'-fli (Ang.-Sax.) (Surcephaga carnaria;

Gr. sarv, flesh, phago, I cat).—A dipterous, or two-winged insect, of the fam. Muscides, of which the common house-fly is the most familiar example. The blow-fly, which is very common in Britain on heaths, in gardens, &c., has a hairy body, with wings that have an expanse of an inch. The face is yellow, the thorax grey with three small stripes, and the abdomen is dark to the tube at an inch from the broad end; to this is brown, which in certain lights has a bine tune, and is covered with shung yellow spots. The eves are always widely separated in both sexes. The larvæ of by the breath, which in the common form is ejected as

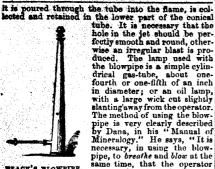
# Blowpipe

the blow-fly feed upon the flesh of animals, either living or dead. Sometimes they are found in mest, the caror dead. Sometimes they are tound in mean, are cap-casses of dead animals, the bodies of living earthworms, and very often upon sheep. The maggots eat their way into the skin of the sheep, which soon die, after suffering great torment. Some parts of England are more intested with these pests than others, and their appearance requires the most untiring attention of the shepherd. Many blow-flies are ovoviviparous, the eggs being hatched within the body of the insect, and their reproduction is very rapid. There is a particular species of this genus which haunts burials

BLOWING - MACHINES, blowing are contrivances, of various kinds, for producing and maintaining a strong current of air for increasing combustion in metallurgical and other processes, requiring intense heat. The simplest form of blowing-machine is the heat. The simplest form of blowing-machine is the ordinary domestic bellows, which is in principle quite inapplicable to metallurgical purposes, from the stream of air being intermittent. By enlarging it, and adding to it an additional expanding chamber, by the rising or falling of which a constant stream of air is maintained, we get the ordinary smith's bellows. This kind, however, is apt to wear out quickly, and has been entirely superseded in all cases where a strong and steady blast is required. The principal kinds of hluwing machines used for blast furposes are these blowing machines used for blast-furnaces are these: The first is simply an air force-pump, worked either by water or steam-power, the air being alternately drawn into and expelled from large cylinders: these generally force the air into a large air-chest, from which tubes to different parts of the factory, leading the blast to various forges or furnaces. The blast is turned off or on by taps inserted in the tubes near the fire-place. In another sort of blowing-machine, much used in iron-smelting, the blast is produced by a series of fans, which revoive at an enormous rate, sucking the air into a tube connected with an air-chest, as in the preceding form. Another kind, in common use on the continent and in America, is called the scaterblowing engine, or trombe. Water, in a finely-divided state, is allowed to fall down a tube, the sides of which contain a series of holes. In falling, the water draws with it a great quantity of air, the accumulation of which causes a draught: the action is analogous to that of the wind produced by a shower of rain. are several other descriptions of blowing-machines. but the above are the most important.

BLOWFIPE, blo'-pipe, an instrument used by workers in metal for soldering on a small scale. It consists essentially of a conical tube, eight or ten inches long, the interior diameter of which varies from half an inch to an aperture the size of a pin-hole. At an inch or so from the small end, it is bent at right angles. It is employed by workmen to direct the flame of a lamp, (generally formed of a bundle of rushes dipped in tallow), upon the portion of solder they are using. It acts by increasing the intensity of the heat of the flame, in the same manuer that the current of air driven through a blast-furnace causes intense combustion of the fuel a biast-furnace causes intense composition of the fuse employed, by increasing the supply of oxygen. In 1738 it was first applied to chemical purposes by Swale, a Swedish counsellor of mines. By the use of the blowpipe there is scarcely a mineral the constituents of which may not be easily discovered. This is effected by combining a small portion of the mineral with a flux, and observing the colour produced, by noticing the effect of heat alone on the mineral, or by reducing it to the metallic state by means of charcoal, carbonate of soda, or some other reducing agent. The blowpipe has of late years become an indispensable adjunct to the laboratory; and the excellent treatises on its use by Berzelius, Plattner, and others, show how much it by herzenus, riaciner, and others, show how much to it valued by chemists of the greatest eminence. The chemist's blowpipe is a modification of that used by the jeweller. The most ordinary form is Dr. Black's, which consists of a straight conical japanned threphate tube, two-thirds of an inch in diameter at the largest only which is closed and one-third of an inch wide at end, which is closed, and one-third of an inch wide at the narrow end, which is open. A small pipe is adapted

## Blowpipe



MEACH'S BLOWPIPE.

a few times through his nostrils while his cheeks are inflated and his mouth closed. After this practice, let him put the order to take breath. . Let the student first breathe him put the blowpipe into

may not interrupt the fiame in

his mouth, and he will find no difficulty

tain through the blowpipe.

When the air is nearly ex-

breathing

before. the muscles of inflated

the cheeks throwing in

яя

while

the air they con-



METHOD OF USING THE BLOWPIPE interrupting the process of blowing."

## Blowpipe

the management of the blowpipe in analytical or the management of the blowpipe in analytical opera-tions, it is necessary to study the properties of the dif-erent parts of a flame. On examining a clear candle-flame, it will be found to consist of the following parts:— the bright blue base, merging into a nearly colourless flame surrounding the mass of burning carbon, within which is contained the tallow or wax absorbed by the wick, and converted into a gaseous state by the heat, On directing the current of air through the flame. On directing the current of air through the flame, about the eighth of an inch above the wick, it becomes much elongated, and, owing to the quicker combustion of carbon, much less luminous. The long flame will be seen to consist of two parts,—one blush, the other yellow, at the junction of which is the point of greatest heat. The blue portion of the flame has the property of withdrawing oxygen from bodies submitted to its action, and is thence called the deoxidizing or reducing flame. The yellow portion, having a contrary effect, is called the oxidizing flame. Deoxidation or reduction is produced in the greatest perfection by using a small orifice, and by keeping the substance under examination surrounded by the flame, so as to defend it from the action of the atmospheric air. Good practice is obtained by fusing a piece of tin, the size of a pea, on charcoal, and submitting the melted globule to different parts of the flame. By varying the strength of the blast and the position of the globule, much experience will be gained in reducing or oxidizing, as the metal shows instantly, by its brilliance or dulness, which of the two actions is going on. The chief articles used in blowpipe analysis are—charcoal, well burnt and is produced in the greatest perfection by using a small the two actions is going on. The chief articles used in blowpipe analysis are—charcoal, well burnt and pretty hard; platinum wire, as thick as a stout horsehair; platinum foil; and hard glass tubes, both closed and open. The principal re-agents are carbonate of soda, black flux (which see), cyanide of potassium, borax, microcosmic salt (phosphate of soda and ammonia), all in fine powder. A strong solution of nitrate of cobalt is also useful. The first four are used as of cobalt is also useful. The first four are used as reducing agents; the last four for producing character-istic coloured beads or flames. Reductions are geneis nearly ex-listic coloured beads or flames. Reductions are gene-hausted, the rally performed on charcoal supports. The beads are mouth is again formed by dipping the end of a platinum wire turned filled with air into a hook into the powdered flux, and fusing it in the from the nos-trils, without colourless. If it is at all coloured, some impurity must To understand have been taken up. Having procured a colourless

TABLE OF BLOWPIPE RE-ACTIONS.

	BORAX.		Mrc. Sa	MIC. SALT.	
	Red.	Oxide.	Red.	Oxide.	
Potash	Colourless	Colourless	Colourless	Colourless.  '' '' '' '' Violet. '' Yellow (hot). Brown (cold). Blue.	
Nickel Zinc Lead Cadmium	Opaque	Violet (hot) Red-brown (cold) Colourless Yellow (hot) Colourless (cold) Yellow-white	Colourless Or in change White enamel Grey Colourless	Brown-red (hot). Red-yellow (cold). White cuamel. Colourless.	
Bismuth	Grey Green	Colourless Red (hot) Yellow (cold) Green (hot) Blue-green (cold) Enancel Volstilized Reduced	Grey Green  Dark-green (hot) Red-brown (cold) Enamel Volatilized Reduced	Green. ''' Green (hot). Blue (cold). Yellow. Volatilized. Reduced.	
Tin Autimony Chromium	Colourless and reduced Reduced and volatilized Green	Colourless, or enamel Colourless	Unchanged'Reduced and volatilized Colourless	Colourless.  Red-green (hot). Green (cold).	

Blubber

Blue Copperss

bead, moisten it slightly, dip it into the assay, and re-fuse it in the oridizing or reducing fiams, as required. Wires are clemed by melting off as much of the glass as possible, and afterwards soaking them in water. The preceding table from Plattner gives the mactions in the two flames, with microcosmic salt and borax, of the more common metallic oxides. It will be noticed that the alkalies, earths, and silicic soid give colourless beads under all circumstances. Their presence is generally tested by the colour imparted by them to the flame. For more particular details, the student is referred to Plattner's treatise on the Blowpipe, a work of wonderful completeness. Potash moistened with hydrochloric acid gives either fame a purple tinge; lithis, red; soda, yellow; strontia, crimson; lime, red, but feebler than strontia; magnesia, with solution of nitrate of cobalt, red; alumina, with nitrate of cobalt, blue. Baryta cannot bead, moisten it slightly, dip it into the assay, and alumina, with nitrate of cobalt, blue. Baryta cannot be detected easily with the blowpipe. Ammonia is see desected easily with the niowpipe. Animonia is easily discovered by gently heating the suspected substance with caustic lime, and holding near it a rod dipped in hydrochloric acid. If ammonia is present, characteristic white fumes of chloride of ammonium are produced. (For the other uses of the blowpipe in

are produced. (For the other uses of the blowpipe in the laboratory, see FURNACES and GLASS-BLOWING.) Blueurs, blub'-her (Ang.-Sax.), the fat of whales and other large sea-animals. Properly speaking, it is the adeps of the animal, and lies immediately beneath the skin and over the muscular flesh. In the porpoise it is a firm and fibrous mass, usually about an inch thick; in the whale its thickness is generally six thick; in the whale its thickness is generally six inches; about the under lip it is two or three feet thick. The quantity of blubber yielded by one of these snimals is generally from twenty to thirty tons, from which from fifteen to twenty-two tons of oil may usually be extracted. The use of the blubber to the animal seems to be partly to poise the body, and render it equiponderant to the water, partly to keep the water at some distance from the blood, and so prevent chill, and partly to reflect the hot steams of the body, and so redouble the heat; since all fat bodies are less

sensible of cold than lean ones.

sensible of cold than lean ones.

Blue, bloo (Sax, bloo; Ger. blau), one of the primary solours. (Sec Colour.) A great variety of blue pigments are used in the arts: they are obtained from both mineral and vegetable sources. Prussian blue, one of the most generally used, is made from a mixture of prussiate of potash and a salt of iron. Indigo is also much used when dissolved in sulphuricated. acid. The Covenniers, in Scotland, chose blue for their colour, in contrast to the red of the king stroop-ers; and at the battle of Bothwell-bridge their standard ers; and at the battle of Bothwell-bridge their standard had a deep adging of blue. From that time blue was adopted by the Whigs as the distinctive colour of their party: hence the term "true blue." After the landing of William III., orange, or buff, was added to the blue, in compliment to the house of Hanover; and these two colours have been retained by the liberal party ever since. The cover of the "Edinburgh Review," and the banners at contested elections, are examples of this party feeling.

BLUEBKARD, bloo'-beerd, is the name of a well-known old Freuch tale of fiction. The hero of the story is a

old French tale of fiction. The hero of the story is a Chevalier Raoul, who had a blue beard, whence his designation. In order to test his wife's curiosity, he intrusts her during his absence on a journey, with the key of a chamber which she is by no means to enter. Unable to stand the test, however, he discovers on his return what she has done, and puts her to death. Several other wives share the same fate, until the seventh, who is rescued by her brothers when about to be put to death; and Bluebeard is slain. The German author Tieck has worked up these materials into a drama, entitled "Phantasus."

BLUE-BLUD (Sialia sialis). — An American bird, closely resembling in its habits the English robin.

BLUE BOOKS is a name frequently given to the re-ports and other documents printed by parliament, from their being usually covered with blue paper. The proceeding away covered with blue paper. The practice of printing their proceedings was lirst adopted by the House of Commons in 1681, and since that time they have increased and extended, till now the printed papers of a session sometimes occupy 60 or 70 large folio volumes. They comprise reports of committees and commissions of inquiry, colonial reports, accounts

and papers relating to trade and finance, the satinates and accounts of public moneys, the votes and proceedings of the house, public bills, &c. The papers of seach session are arranged so that they may be bound up in regular order, and have an index, by means of which any paper may be at once found. General indexes have also been published from time to time, extending over a series of years. The blue books contain an extraordinary amount of information in all departments of legislative inquiry;—in law, history, the privileges of parliament, negotiations with foreign powers, and every variety of statistics. These are, however, so mixed up with much that is of little or no value, that they are in a great measure buried. The statistical they are in a great measure buried. The statistical they are in a great measure buried. The statistical returns, in particular, are by no means so useful as they might be made if they were prepared in a regular and uniform manner. They are moved for at different times and for particular objects: one dates from lat January, another from 5th April; one calculates the value of exports by the offlicial, another by the declared or real value; one shows the gross, another the net revenue; one includes the United Kingdom, another exceeds only to Great Britain. In order to obviate in tends only to Great Britain. In order to obviate in some measure these defects, the statistical department some measure these defects, the statistical department of the Board of Trade was formed in 1832, for preparing regular accounts of the revenue, commerce, and navigation of this and other countries. With a view further to improve the character of parliamentary returns, the printing committee, in 1841, suggested—"1. That every member be recommended, before he gives notice of a motion for a return, to consult the librarian of the House of Commons; 2. that, after the order for a return has been made by the house, the librarian do prepare, when necessary, a form, to be submitted to Mr. Speaker for his approval, and that such form shall be forwarded, with the order, in the usual manner; 3. that, before any return which has been presented to the house shall be ordered to be printed, it shall be inspected by the librarian and approved by Mr. Speaker." These recommendations have since been repeated by the printing committee. The heavy expense incurred in printing is another great objection to the present system of preparing the blue books. Many maintain that properly-prepared abstracts would be infinitely more useful than the reports as at present issued. "I speak from some personal observation," says Lord Stanley, "when I say that, at a cost hardly greater than that of those desultory, fragmentary, isolated returns, it would be possible to present to the nation such a yearly resumé of administrative statistics as should, to a very great degree, supersede the prethe house shall be ordered to be printed, it shall be as should, to a very great degree, supersede the present system (if system it can be called) of moving for returns as and when they are wanted. . I think a statistical department desirable, instead of a statistical branch in every department; because the former method gives better security for unity of plan, and because the work will be best done by those whose sole and undivided business it is."—Speech at British Association, 1856.

BLUEBOTTLE-FLY. (See FLESH-FLY)

BLUE BREAST (Motacilla succica), one of the English names of a pretty bird which forms the link between the redstart and the lapwing. It resembles both birds closely, and is sometimes called the blue-throated robin, and sometimes the blue-throated redstart. The blue breast is found in the same countries where the redbreast is found, and particularly on the borders of forests. It is very rare in this country: in Yarrell's "British Birds" mention is made of four cases in which blue-breasts have been shot in England. The song of the blue-breast is very agreeable: it resembles one nue-oreast is very agreeable; it resembles two voices,—one deep like the humming of a violin string, and the othersoft, like the sound of a flute. The blue-breast builds its nest in bushes and in the holes of trees, and lives upon flies, worms, and the larvæ of insects. It is also said to feed upon elder-berries. It lays six eggs, which are of a greenish-bine colour.

Blue coat School. (See Christ's Hospital.

LONDON.)

BLUE COPPER, a fine blue mineral, consisting of sulphide of copper. It is also known as indigo-copper.
BLUE COPPERS, sulphate of copper, so called to
distinguish it from green expers, which is sulphate
of iron. (See COPPER, SULPHATE OF.) It is also called blue vitriol and blue-stone.

## Blue Gowns

Blux Gowns, a name commonly given to a privi-leged class of beggars in Scotland, who were king's bedesmen, and received a small royal bounty. Blux John, a name given by miners to the blue variety of Derbyshire or fluor spar. It occurs in

oubical crystals or in granular crystalline masses, and is much used for making ruses, cup, and other ornaments. It is found principally at the Blue John mine at Castleton, in Derbyshire, and in the lead-mines of Alston Moor, in Cumberland. (See Fluor Spar.) This material is daily becoming scarcer. It requires great skill in working, owing to its brittleness.

BLUE MANTLE, the heraldic title of one of the pur-

suivants at arms attached to the Herald's College.

(See PURSUIVANT.)

BULL-STOCKING is a name given to a female who gives herself up to learning and literature, to the neglect of her womanly duties, and makes a show of her acquirements in a pedantic manner. The name originated in London about 1780. It was much the fashion at that time for ladies to have evening assemblies, where they might mingle in conversation with literary and other distinguished men. An eminent member of these societies was a Mr. Stillingfleet, who always wore blue stockings; and such was the excellence of his conversation that, when absent, the ladies were wont to say, "We can do nothing without the blue stockings." Hence these societies came to be called Bhue-Stocking Clubs.—Ref. Boswell's Life of Johnson.

BLUE-STONE .- Sulphate of copper. (See BLUE COP-

BLUE TIES. (See TIES.)
BLUE VERDITER, a fine blue pigment, with a slightly greenish tinge, prepared by precipitating the hydrated oxide of copper from the nitrate of copper solution left as a by-product in silver-refining, by means of potassa. Care must be taken to add an excess of potassa, otherwice a basic salt of a different colour is produced. Blue verditer is much used by paper-stainers and artists, but its use as a pigment should be avoided, as it is very liable to turn black when exposed to the action of sulphuretted hydrogen.

BLUE VITRIOL. Salphate of copper. ( See BLUE

COPPERAS.

BLUFF, bluf (Ang. Sax.), a high bank, almost perpendicular, projecting into the sea; a high bank, presenting a sharp front.

BLUING, the process of heating steel or iron until it BLUNDERBUSS, blun'-der-bus (Ang.-Sax. blunder,

and Dn. bus, a tube), a short fire-arm of large calibre, widening towards the muzzle, adapted for discharging many bullets at once, so that, without any exact aim, there is a chance of one or more of the bullets hitting the mark.

BLUSHING, blush ing (Dan. blussen, to blaze or glisten), is a sudden suffusing or reddening of the face, excited by a sense of shame, confusion, or surprice. It is produced by an increased flow of blood into the capillary vessels of the face and neck; and besides reddering, it creates a sensation of heat in those parts. It is occasioned by the mental shock acting upon the brain, and, withdrawing the nervous energy which ordinarily contracts the muscular coats of the bloodvessels of these parts, whence the blood is permitted to flow with greater violence through the

Tessels.—Ref. Chambers's Encyclopædia.

BOA CONSTRICTOR, bo'-à con-stric'-tor.—This encranous reptile is found in the interminable marshes of New Guinea, and other hot portions of the American continent, in India and the Indian islands, and in Africa. The branches of the upper and lower jaw of this creature, as well as the bones of the palate, are armed with recurved and pointed teeth, forming four rows above and two below. The pedicle of the lower jaw is moveble, which itself is almost wholly suspended to another bone, analogous to the mustoid, attached to the skall by muscles and ligaments. The branches of the lower jaw are not united, and those of the upper new are attached to the inter-maxillary bone only by ligamenta, so that these animals can expand the mouth sufficiently to swallow begies much larger than them-selves. The ground-colour of the boa is most frequently

# Boarding

variegations, leaving large open oval spaces of the variegations, leaving large open oval spaces of the ground-colour at regular intervals. Boss have been reported, by credible authorities, as reaching the examining to read of their reaching sixty feet in length. Indeed, if we go back to the period when home was a great city, we shall read of one that had it had not the shores of the Bagradas, and that measured a hundred and twenty feet in length. All the wespons the army of Regulus was able to bring against the the army of Regulus was able to bring against the monster were of no avail, and it was not slain till it monster were of no avail, and it was not slam till it had destroyed several battalions, and the siege-engines, loaded with ponderous stones, were levelled against it. It is certain, however, that this bos, if not a pure invention, has been lengthened outrageously. Actually, the bos constrictor possesses enormous strength, appetite, swallow, and powers of digestion. They have been known to swallow whole goats and pics, beginning the property in the property of the property and gradually surjours it does not be supported by the property of the property and gradually surjours it does not be property and gradually surjours in the property of the property and gradually surjours in the property of the property and gradually surjours in the property of the propert the prey at the muzzle and gradually sucking it down. In December, 1861, a boa constrictor, confined in the In December, 1801, a non construct, compet as any Jardin des Plantes, swallowed the blanket provided for its warmth, and, after retaining the indigestible meal for four weeks, disgorged it: it died shortly afterwards. There are several other of the box species, besides the above. The spotted box (Box reytale) of South America, the ringed box (Boa centhria) of the same country, the embroidered box (Boa Phrygia) of the fast Indies, the canine box (Boa canina), and the garden box (Boa hortulona). The embroidered box is supposed to be the most splendid of the tribe; it is about four feet long, the ground-colour is white, the back tinged with golden-brown, while along the whole of the upper part is a series of black variegations bear-ing a striking resemblance to embroidery.

BOAR, bore, the male of swine. (See Hog.)
BOAR, WILD (Sus scrofa).—All the varieties of the
useful gen. Sus that are now seen in civilized countries, owe their origin to the wild boar, which is a native of nearly all the temperate parts of Europe and Asia. It was formerly a beast of chase in the woods of this country, and, at the present day, it is bunted in India and in many parts of Europe. It is generally more and in many parts of Europe. It is generally more gaunt and bony than the common bog, and its muscular strength is greater. When about a year or two old, the hide has a yeilowish-brown hue; but, in time, this changes to a dark brindled grey. There is a fine soft hair, of a woolly nature, next the skin, between the bristles. The snout of the wild boar is rather longer than that of the common hog; but the chief difference lies in the savage disposition of the former and the extraordinary length of his tusks. males are mild, except when their young are attacked. The tusks of the wild hour are long, curved, and sharp, and are capable of inflicting severe and fatal wound After they are five years old, however, these tusks begin to turn up, and are not such formidable weapons. Buffon says of wild boars: "These animals, when they have young, form a kind of flock, and it is upon this sione that their safety depends; when attacked, the largest and strongest front the enemy, and by pressing all round against the weaker, force them into the centre." On account of the excitement and danger connected with wild-boar hunting, it has been at all times a very favourite sport. The ancient Romana used to hunt them on foct with large spears. In later times, William the Conqueror punished, with the loss of their case all are all the spears. of their eyes, all persons convicted of killing the wild boar, the stag, or the rochack. (See Hog. Sus.)
BOARD, bord (Sax. bord, a table; Fr. bureau), is a

term usually applied to certain individuals who, in a collective capacity, are intrusted with the management of some public office or department. Thus, the lords of the Treasury, the commissioners of customs, when met together for the transaction of the business of their respective offices, are styled the Board of Treatheir respective offices, are styled the Board of Tressury, Board of Customs. It is also used to designate the persons appointed by competent authority to manage any private business or speculation,—as a bank, railway, or such like; the directors of which are styled Board of Directors.

BOAPDING Logic line was approached a styled to the

BOARDING, bord'-ing, an expression applied to the attempt to carry an enemy's vessel by assault. It was of frequent occurrence during the war with France, vellowish-grey; and disposed along the entire length in the early part of the present century. After the

## Boarding-Pike

some time, and the contending vessels have drifted closely together, in the course of the action, an oppor-tualty is cought to attach the ships together by means tunny is sought to attach the sups together by means of grappling-irons. A party of seamen and marines, already told off for the purpose, then spring on board the submy's ship, and a furious hand-to-hand encounter takes place, with cutlasses, pistols, and pixes, which is apsadily terminated by the success on repulse of the attacking party. As the French soldiery dreaded to cross beyonets with the English troops during the Peninsular war, and turned as soon as they were near enough to see the eyes of the approaching human avaianche, so the French sailors could seldom withstand the irresistible rush and hearty cheering of the British as they swept the decks of their paralysed defenders, and drove them pell-mell below. Boarding is generally adopted by privateers in the capture of merchant vessels. It is thought by competent judges, among whom is Sir Howard Douglas, author of a work entitled "Warfare with Steam," that boarding will be as much resorted to when steam vessels of war approach as much resorted to when steam vessels of war approach closely to each other in an engagement, as in the smart frigate-actions of former days. It is therefore recommended that all vessels should be well provided with the necessary appliances for attack by, and defence against, boarding, for the latter of which a plan is suggested of barricading the quarter-deck and forecastle, to afford means of continuing resistance, should the main deck be carried. But in consequence of the results of the battle of Hampton Roads (March 9, 1862), between the Merrimac, of the Confederate States navy, and the Monitor, of the United States navy, both iron-clad ships, heavily armed, and protected with iron shields and defences, under cover of which the guns worked, which battered each other with heavy ord-nance for five hours without material injury on either side, an entire change in naval warfare and tactics must take place; and as low iron ships, with cupols shields, on Captain Coles's plan, in which the men who navigate the vessel and work the guns are out of sight, will now take the place of wooden ones in our own navy, as well as in the navies of all maritime powers, it is manifest that boarding can never again be put in practice in vessels built on these principles, but that it must be numbered among the traditions of past

BOARDING-PIRE, in Mar., a weapon formed of an iron spike fixed on an ashen staff, used by sailors in boarding an enemy's ship. It is frequently called a half-pike, from its having a much shorter staff than the whole pike.

BOARD OF ADMIRALTY. - A department of the government which has the management of all matters government which has the management of all matters connected with the royal navy. It exercises the powers which formerly were vested in the lord high admiral; and its members are styled the "Lords Commissioners of the Admirally." They are six in number; and the first lord is always a member of the cabinet. It is the first lord that principally exercises the powers of the office. He is to all intents and purposes the lord high admiral, the other lords acting merely as his advisers and council. It is he that is held responsible in par-liament for the conduct of this branch of the public service. Of the five junior lords, four are always naval or sea lords, two of them generally admirals, and the fifth is a civil lord. This board has the management of everything connected with the navy, both in war and in peace. By their orders ships are built, repaired, sold, or broken up; put into commission or out of commission; armed, stored, and provisioned; employed at home or on foreign stations. Repairs, alterations, and improvements in the dockyards are under their direction; and all inventions and experiments relating to naval matters are laid before them for approval. All orders and instructions to officers emanate from them: and all official returns from the fleet, and every practical detail respecting the condition and discipline of the ships, are addressed to them. All naval honours, proand by their recommendation all pensions, gratuities, and appointments emanate from this hoard; and by their recommendation all pensions, gratuities, and appearantmentions are granted. Under the six lords are two secretaries in-chief, who manage the daily work of the office. The lodds of the Admiralty resign with the ministry,—an arrangement that gives rise to many crils. The salary of the first lord is £4,500, and

## Boar's Head

his official residence is the Admiralty, Whitehall Each of the junior lords has a salary of £1,000, and an official residence, or, in lieu thereof, £200 additional.

BOARD OF ORDRANCE.—A department of the government, which has now been abolished, but which has the meanagement of all matters relating to the artillery and engineering corps of the British army. It consisted of the master-general of the ordnance, who was usually a distinguished military officer, and who, in all matters connected with the discipline, regulation, and distribution of these corps, exercised supreme authority; the surveyor-general, the clerk of the ordnance, and the principal storekeeper, all of whom held their appointments under the great seal during pleasure. During the Crimean war the defects of this board became very manifest, and it was accordingly dissolved, and the duties of the master-general distributed among the different departments of the War-office.

BOARD OF TRADE AND PLANTATIONS.—A department of the government which may be said to have originated in 1660, when Charles II, erected two separate councils, one for trade and another for plantations. sundry subsequent changes, the present department was established by order of council in 1786. In reality the board is a permanent committee of privy council constituted for the consideration of all matters spe cially relating to trade and the colonies. It consists of a president and vice-president, appointed by the queen It consists of in council, and certain other members, who have exofficio places at the board. These are the lord chancellor, the first lord of the Treasury, the principal secre-taries of state, the chancellor and the under-treasurer of the Exchequer, the speaker of the House of Com-mons, chancellor of the duchy of Lancaster, paymaster of the forces, master of the Mint, and such officers of state in Ireland as are privy councillors in England. The precident and vice president form nominally the board, and transact on their own responsibility all such general doties as relate to the trade and com-merce of the United Kingdom, and advise with the other departments of the government upon these matters. They also superintend the conduct of all bills and questions before the parliament as relate to commerce, and exercise some control over private bills so far as the protection of the public is concerned. Another department has also been added to the Board of Trade,-that of the regulation and control of railways. They appoint inspectors of railways, approve or disallow by-laws, and require detailed returns of traffic and of the rates charged. They have also the general superintendence of all matters relating to morchant ships and morchant seamen. A department for the collection of statistics was formed in connection with this board in 1832. The president has a salary of £2,000; the vice-president, who is also paymater-general, has for both offices £2,000; and the two joint secretaries £1,500 each.

BOARDS, SACRED, were small pieces of wood, which were struck together for the purpose of assembling the people to worship, before the use of bells. In some Roman Catholic countries such boards are still employed during Passion-week, as the noise of belle is considered to be unsuitable for the occasion; and they return to the bells on the first day of Easter.

BOAR-FISH (Capres), a fish of the Dory fam., which takes its name from the resemblance borne by its mouth to the snout of the hog. Its firs are covered with rough scales, and it has no spines along the dorsel or anal fine. The eyes are very large, and placed far forward. It is of a carmine colour, lighter below, and with seven transverse orange bands on the back. It is a well-known inhabitant of the Mediterranean, and is very rarely seen on the British coast. Its fiesh is of poor quality.

Role's Heap, in our ancient customs, was the first dish on Christmas-day, and was carried up to the principal table in the hall with great state and solemity. A carol which was sung on this occasion was as follows (See CHRISTMAS.)

"The bore's head in hands bring I
With garlandes by and rosemary;
I pray you all eyings merily,
Qui setis in convito.

## Boat

The bore's head I understande, Is the chefe servyce in this lande; Loke wherever'it be fande, Servite cum cantico

Be gladde, lordes, both more and lasse, For this hath ordayned our stewarde, To chere you all this Christmasse, The bore's head with mustarde."

Boar, bote (Sax. bot), a small vessel propelled on the water by rowing or sailing. There are a great many kinds of boats, the construction and machinery of which are very different, according to the purposes for which they are intended. Thus, they are occasionally slight or strong, sharp or flat-bottomed, plain or ornamented; as they may be designed for swiftness or burden, for deep water or shallow, for sailing in harbour or at sea, and for convenience or pleasure



BOATBILL.

BOATBULL, bote'-bill (Cancroma cancrophaga), an inhabitant of Cayenne, Guiana, and Brazil. It is about the size of the domestic hen. beak resembles boat reversed, having a strong keel-like ridge down the middle of the upper mandible. The food and general habits of this bird place it among the herons. It chiefly lives by the

sides of rivers. BOATEGOX, bote'-hook, an iron hook, with a sharp spike on its hinder part, fixed upon a long pole or shaft, by the help of which a person in a boat may either hook anything to confine the boat in a particular place,

noor anything to commute the boat in a particular place, or push her off with the point.

BOATING, boi-fing, was a severe punishment inflicted by the ancient Persians on capital offenders, in the following manner:—The condemned person being his on his back in a bont, and having his hands stretched out and tied fast on each side of it, had another boat put over him, his head being left out through a hole made for that purpose. In this posture they fed him, till the worms which were bred in the excrements he voided as he thus lay, entirely consumed his howels, and so caused his death, which usually took place in about twenty days.

BOATING.—A boat is managed or propelled by either sails or oars. When the art is pursued by means of sails, it is termed yachting; when the propelling power

sails, it is termed yachting; when the propeiling power is that of oars, the art is termed rowing. (See Rowling and Yachting.)

BOAT, LIFE. (See LIFEBOAT.)

BOAT-LOWERING APPARATUS.—Every ship of war carries along with her boats for particular services; and every passenger-vessel is compelled by law to carry a certain number of boats. The ropes and pulleys used in letting down these boats from the crange or daying the compelled by the carry of the crange of daying the compelled by the carry of the crange of daying the compelled by the carry of the crange of daying the carry of the crange of daying the carry of the crange of daying the carry of the in letting down these hoats from the cranes or davits into the water constitute the boat-lowering apparatus. The means by which boats were formerly lowered were very inefficient; but great improvements have taken place of late years. When boats had to be lowered in place of late years. When boats had to be lowered in any emergency, such as a shipwreck, great difficulty was found in extricating them, and they often capsized in their descent, plunging their occupants into the water. Lacon's friction-break and Kynaston's discongaging hooks were two of the earliest attempts at amelioration. By the former, one man can regulate the rate of a boat's descent, and by the latter, hoats can be both raised and lowered more quickly. Clifford's apparatas, which is now supplied to many ships of war, passenger-ships, and merchant-ships, is considered one of the most valuable. By means of it, the boat is lowered and disengaged by one man seated in the bost.
Experiments were tried on board of H.M.S. Princess-Boyds, in 1856, by order of the Admiralty. Twelsteness got into the starband cutter when she was hanging from the dayits. She was quickly and steadily lowered by one man into the water, a distance of 40

## Bodkin

Many lives have been saved by the use of three tons. this apparatus.

BOATSWAIN, bote'-sin, a warrant officer in a ship, who has charge of the boats, sails, rigging, colours, suchors, cables, and cordage. It is the business of the officer to summon the crew to their duty, and to maint with his mates in the working of the ship

BOATSWAIN'S MATE is an assistant to the boatswain in all the above-mentioned duties, with the disagreeable addition of inflicting all punishments to which the men are subjected.

BORBIN-NET. (See LACE.)

BOBSTAY, bob'-stai, in Mar., a rope used to confine the bowsprit downwards to the stem or cutwater, and to counteract the force of the stays of the foremast, which it draws upwards. It is fixed by passing one of its ends through a hole bored in the fore part of the cutwater, both ends being spliced together, so as to make it twofold, or like the link of a chain. A deadeye is then fixed in it, and a lanyard passed through, which communicates with another dead-eye upon the bowsprit. This is then drawn extremely tight by the help of mechanical powers.

Boc, Bock-LAND, or BOOKLAND, in the Saxon time, was what we, at the present day, call freehold land, or land held by charter; and it was by that name distin-guished from folk-land, which was copyhold land.

Bode's Law, bodes'-law, in Astron., an arithmetical formula which approximately expresses the distances of the planets from the sun. Kepler led the way to its discovery in an attempt to find a general law by which the distances of the planets from the sun were governed, by showing that there was an undue space between the orbits of Mars and Jupiter, in comparison with the relative distances of the plauets from the sun. This caused him to conjecture that a planet hitherto an-observed really existed, having its orbit between those of Mars and Jupiter; and in 1772, this formula, known as Bode's law, was enunciated by Bode, who boldly declared that Kepler's idea would be found to be an actual fact. The law itself is as follows:—Supposing 4 to represent the distance of Mercury from the sun, the distance of the other planets is obtained by adding to this number a geometrical series, of which 3 is the first term, increasing by the ratio 2. Thus, the dis-tances of the planets from the sun are respectively represented as follows; and, for the sake of comparison, the actual mean distances from the sun are given in another column, calculated on the supposition that the distance of the earth is represented by 10.

NAME OF PLANET.	NAME OF PLANET, Distance according to Bode a Law.			Actual Mean Distance
Mercury	. 4	=	4	3.87
Venus	. 4+ 3	=	7	7:23
The Earth	. 4 + (3 ×	2) =	10	10.00
Mars	$.4 + (3 \times$	4) =	16	15.23
Supposed Planet }	4 + (3 ×	8) =	28	26.25
Jupiter	$4 + (3 \times$	16) ==	52	52.03
Saturn			100	95:39
Uranus	$.4 + (3 \times$	61) =	198	191.83
Neptune	$.4 + (3 \times 1)$	(2S) ==	388	300.00

That there must be some truth in the system above given, is proved by the discovery of the sixty-nine asteroids (see ASTERIOTES) since 1800, which fill the place that Kepler supposed to be occupied by a planet. There is no very great deviation from the numbers arbitrarily laid down, except in the case of Neptune. The satellites which revolve round Jupiter and Saturn follow a similar

law in their respective distances from their planets. Bodies, Regulable bod'-eez, in Geom., a term applied to five solids; as the icosuhedron, with twenty regular pentagonal faces; the dodecahedron, with twelve triangular faces; the octahedron, with eight triangular faces; the cube, or hexabedron, with six square faces; and the pyramid, or tetrahedron, with four triangular faces.

BODKIN, bod'-kin (Ang.-Sax.), a large kind of needle used by the women of antiquity for the same purposes as they now are, and also in fastening the hair. It was termed belong with the Greeks, and by the ancient . Romans acus. These instruments were made not only lowered by one man into the water, a distance of 40 of metal but also of bone, wood, and ivory. The fashion feet. The boat, the men, and the gear weighed nearly of fastening up the hair behind by means of the bodking

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#### Bodle

The term still prevails in Ituly and parts of Germany. bodkin applies, at the present time, more particularly
to a sharp pointed instrument
used for piercing holes in cloth.



BODKIN.

Formerly the term was given to a dirk or dagger; and in Shakspere, Hamlet is found Shakspere, Hamlet is found saying "Who would bear the whips and scorns of time; The oppressor's wrong, the proud man's contumely, . . . When man's contumely, . . . When he himself might his quietus make with a bare bodkin." is also the name of an instrument with an eye, for drawing tape, thread, or ribbon through

BODLE, or BODDLE, bo'del, an ancient Scottish copper coin, of the value of two pennies Scots, or the third part of a halfpenny sterling. It is said to have been named after a master of the mint of the name of Bothwell.

BODLEIAN LIBRARY, 3od'-le-in, the public library of the university of Oxford, so called from Sir Thomas Bodley, by whom it was restored in 1597. He pre-sented to it a large collection of books purchased on the continent, and valued at £10,000. Other collections were sent in to such an extent that the old building soon became insufficient to contain them; and a new wing was added to it by Sir Thomas, the foundationstone of which was laid in 1610. He also on his death, in 1612, left a considerable estate to the university, in lands and money, for salaries, repairs, and new books. Among the more important collections that have since been added to it are those of the carl of Pembruke, John Selden, Archbishop Laud, Sir Thomas Roe, Sir Kenelm Digby, General Fairfax, Richard Gough, and Francis Douce. The library has also been largely increased by purchases, and by being entitled to a copy of every work printed in the United Kingdom. At present it is estimated to contain about 265,000 printed volumes, and upwards of 22,000 in manuscript. All members of the university who have taken a degree are admitted to the use of the library; and literary are admitted to the use of the interry; and interary persons properly recommended are also allowed to consult the books. No books are allowed to be taken out of the library. It is open between Lady-day and Michaelmas from 9 in the morning to 4 in the afternoon, and between Michaelmas and Lady-day from 10 to 3. In terms of a statute passed in 1856, a reading-room has been attached to the library, open throughout the year from 10 in the morning to 10 in the evening.

Bopy, bod's (Ang. Sax.), a term very variously used. In Phys. it denotes a solid, extended, palpable substance of three kinds; as a soft body,—one which, yielding to a blow, undergoes a change; a hard body,one which remains unaltered after being struck; au elastic body,—one whose form changes upon being struck, but recovers again when the impelling force is removed. With respect to animals, body signifies the frame, the material substance, in contradistinction to the living principle in beasts and the soul in man; in other words, matter as opposed to spirit.

BODY COLOURS, pigments used in executing he-raldic paintings and illuminated work, in which the colour is required to be laid on in such a manner that it may form a thick uniform coating over the paper or vellum on which the outline is traced, utterly devoid velium on which the outline is traced, utterly devoid of transparency. Body colours for these purposes are generally sold in the form of powder, and require to be mixed with a little gun-water. They can be made, however, by the mixture of any simple water-colour with flake-white or Chinese white; thus, the heraldic colour is the statement in which will transpare to colour, blue with flake-white or Chinese white; thus, the heraldic name is obtained by mixing ultramarine or cobait-blue with either of these pigments. Body colours prepared in this manner are used by painters to produce bril-lisht effects in water-colour drawings, and form high lights, such as those reflected from armour, which cannot be obtained so clearly by putting on the co-louring shade by shade, or by wiping out with rag or

chamos leather.

BODY OF A CHURCH, the name usually given to the nate of a church, as distinct from the side-aisles and chancel. (See Navr.)

# Bohemian Brethren

BGREERIA, be(r)-meer-i-a, in Bot, a gen; of places belonging to the nat, ord, Urflences. From several species valuable fibres are obtained. B. frutescess, or puya, a plant growing wild in Nepaul and Sikkini, it he source of the celebrated Poosh fibre, which rivals the source of the celebrated Pooch fibre, which results the best European flax for tenacity. This species stains the height of six or cipit feet; but the steem is usually very slender. It is cut down for use when the seed is formed; the bark is then peeled off, dried, sold with wood-ashes, and beaten with mallets, to separate its component fibres. B. speciosa, the wild, rhea, also yields a very strong fibre, which is much used in the East. B. ninea, the Tehou Ma of the Chinese, is now known to yield the fibre used in the manufacture of the beautiful fabric called Chinese grass-cloth. The species of continuing this genus were formerly regarded as species of Urtica, the nettie.

BOREHAAVIA, bety-hat-ria (so named after Boer-

BORHHAYIA,  $be(r).hu!\cdot ij\cdot a$  (so named after Boerhaave, the celebrated physician), in Bot., a gen. of plants belonging to the nat. ord. Nyctoginacca. The species ere employed medicinally, both in Peru and the East Indies, having emetic and purgative proper-ties. B. tuberosa, a native of Peru, is employed as a

culinary vegetable.

Bog, bog (Celtic, soft), the name commonly given to a wet spongy morass, composed, for the most part, of decayed vegetable matter. The Bog of Allen is the most extensive of the numerous bogs found in the British isles. Chatmoss, in Lancashire, is another celebrated bog, being twelve square miles in extent. The origin and composition of bogs will be found to be fully treated of under the head PEAT.

HOG-BEAN. (See MENYANTHES.)

BOG-HEAD MINERAL, also known as the Torbane-head mineral (which see).

Bog IRON-ORE, a ferruginous deposit found at the bottom of bogs. It consists mainly of peroxide of iron, and is formed by the subsidence of the iron oxides and carbonates held in solution by the bog water. It occurs in some parts of America in such large quantities as to be commercially valuable. It is of a reddish-brown colour, and has been occasionally used as a pigment. Some varieties of bog iron-ore contain phosphates.

BOGNOR BEDS. (See LONDON CLAY.)

Bog-Oak, Bog-woon, a name applied to the trunks and large branches of cake, firs, and other trees found in the Irish and Scotch bogs. It derives its intense black colour from being impregnated with iron. It is very hard, and is capable of receiving a high polish. It is much used in Ireland, in combination with gold

and silver, for articles of jewellery.

Bogonitt, bog-om'-i-le, in Eccl. Hist., was the name of a sect which appeared in the 12th century, founded Basil, who was burned by Alexius Compenus in 1118. The name is derived from the Bulgarian bog, lord, and milui, have mercy. Their creed resembled the doctrines of the ancient Gnostics and Manicheans. They believed in two principles in the universe, a good and an evil; that the soul or spirit emanated from the good principle, but that the body and all material things were created by the evil one. Hence, they riewed the body as the prison-house of the immortal spirit, and believed that it ought to be energated by fasting, contemplation, and other exercises, so that the soul might gradually be restored to its primitive liberty. They were also opposed to marriage. They denied the reality of Christ's body, and rejected the law of Moses. They used no prayer but the Lord's Prayer, and rejected all sacraments. This sect was subjected to great persecution, but continued to exist down to the 13th century. Bog-TROTTER, a term of contempt frequently applied

to the lower classes of the Irish agricultural labourers, and founded on the singular ability they have acquired, by long custom and practice, of passing securely over the extensive quagmires or bogs of their native country. Where strangers would sink and sometimes perish in the treacherous morass, their habits and instincts teach them to find a safe footing,—a facility which formerly was often employed to clude the pursuit of soldiers, police, and officers of law.

ponce, and omeers of his.

BOHEMLAN, OF MORAVIAN SRETHERN, bo-he'-mi-an;
a sect of Christians, so called from the countries in
which they originally existed, but who designate themselves "The Union of Brethren" (Unitas Fratram).

They scose in Frague, the capital of Bohamis, about the middle of the 18th century, and were formed of certain remands of the Bussites who differed from the Calintines, another party of Hussites, in being more opposed to the errors of popery, and of stricter ecclemantical discipline. In 1453 they betook themselves to the borders of Silesia and Moravis, where they formed themselves into separate communities, and distinguished themselves from the rest of the Hussites by the name of Repthers of the Law of Christ the by the name of Brothers of the Law of Christ, the Union of Brethren, or United Brethren. They sufthere great persecutions, both from the Calixines and the Roman Catholics; but they suffered unresistingly, approxing nothing but reasonable remonstrances and presper to the rage of their persecutors. They were often confounded by their opponents with the Waldenses and Picards, and, on account of their being fre-quently compelled to conceal themselves in caverns and solitary places, they were called Cave-dwellers (Gradenkeimer). In spite of persecution, however, from the steadfastness of their faith and the purity of their morals, their numbers greatly increased, and in 1500 they numbered 200 parishes, most of whom had chapels connected with them. It being against their principles to engage in strife, they refused to take up arms in the Smalcaldic war against the Protestants, and, in consequence, Ferdinand deprived them of their churches; and in 1548 about 1,000 of them retired into Poland and Prussia, where they at first settled at Marienwarder. The agreement which these exiles entered into at Sentomir with the Polish reformers in 1570, and, still more, the Dissenters' Peace Act of the Marienwerder. Polish Convention in 1572, secured them toleration in Sales Convention in 137, secured them toleration in that country; while the subsequent persecutions of Sigismund III. united them still more closely to the Reformers, with whom they have maintained a connection to the present day. Those who remained in Moravia and Bohemis obtained some degree of liberty under Maximilian II., and had their chief seat at Fulmek, in Moravia. The Thirty Years' War, which terminated so disastrously for the Protestant cause, occasioned the entire destruction of the Bohemian churches and broke up their societies. Their last bishop, Amos Comenius, took refuge in England, and commended the cause of his people to their pious brethren of the Church of England. About this period, some of the persecuted refugees obtained pro-tection and privileges from the English government, and the church of Austin Friers, in the centre of London, was granted to one of their ministers. Again, in the reigns of Charles II. and George I., the case of these aufferers was recommended to the people of England, and moneys collected for their aid in the churches throughout the kingdom, with the express Those that remained in their own country continued to meet secretly and by stealth, until, at last, a number of them found refuge on the estates of Count Zinzen-dorf, in Lusatia, where they built an humble village, and assued it *Herrnhut* (the Lord's shelter), and which is still the principal settlement of the society. They first appeared as a body in England shortly before the middle of the last century. They laid their case before parliament, when their doctrines, discipline, and hisparliament, when their soctrines, uncupaire, and actory were scrapulously investigated by committees of both houses; and two bills were passed (20 Geo. II. c. 44, and 22 Geo. II. c. 30) in 1747 and 1749, exempting them from taking oaths and bearing arms in certain cases. The early Brethren attempted to restore of the Christian church, and the primitive purity of the Christian church, and framed their constitution according to the accounts They took the that remain of the Apostolic churches. Scriptures as the ground of their doctrines, and exercised a strict system of superintendence over their members, extending even to the minute details of domembers, extending even to the minute details of do-mestic life. For that purpose, they had a number of officers of different degrees,—viz. ordaining bishops, senses, sadies, and conseniors, presbyters or preachers, des-cesses, sadies, and scotytes,—among whom the manage-ment of the ecclesisatical, moral, and civil affairs of the community was distributed. They had three classes of members,—Myinners, proficients, and the refect, and three degrees of excommunication, and mber of emigrants from Bohemis and Moravia to

Herrnhut had considerably increased, and when many religiously disposed persons from other quarters came to settle among them, the consequent diversity of sextiments suggested the propriety of their having some rules drawn up for their direction and guidance cordingly, with the assistance of Count Zinas (who is justly considered to have been in some measure the founder of that society, to which he devoted his life, property, and energy), certain articles of union were drawn up, which, leaving all the distinctive doc-trines of the various Protestant denominations entirely out of the question, adopted, as articles of faith, only those fundamental Scripture truths on which they all agreed, and, at the same time, introduced a system of social compact and church discipline resembling that of the ancient church of Bohemian Brethren. articles were, after mature deliberation, adopted by all the inhabitants of Herrnhut, who pledged themselves mutually to their observance, under the name of a Brotherly Agreement, in 1727. They admit among them individuals from all Protestant denominations, without renouncing their original church or creed. In fact, they strenuously object to being considered a separate sect or denomination, maintaining that their union is founded exclusively on general Christian doctrines, and that their peculiarities relate solely to their social organization, by which they attempt to put truly Christian principles of life and conduct into actual practice. They profess a general adherence to the Angaburg Confession, but avoid discretions respective the proposition of the profession of the conductive of the profession of the pro general statements to the Augusturg Contession, but avoid discussions respecting the speculative doc-trines of Christianity. At a general synod held at Barby in 1775, it was agreed that they steadisstly maintain the following five points, without lessening the importance of any other article of the Christian faith :- 1. The doctrine of the universal depravity of man, and that, since the fall, he has no power whatever left to help himself. 2. The doctrine of the divinity of Christ. 3. The doctrine of the atonement and satis-Christ. 3. The doctrine of the atonement and satisfaction made for us by Jesus Christ; and that by his merits alone we receive freely the forgiveness of sin and sanctification in soul and body. 4. The doctrine of the Holy Spirit and the operation of his grace; that it is he who worketh in us conviction of sin, faith in Jesus, and pureness in heart. 5. The doctrine of the fruits of faith; that faith must evidence itself by willing obedience to the commandments of God, from love and gratitude. Their church is episcopal in form, and they have three orders of ciergy, bishops, prea-byters, and descons. The bishops alone are authorized to ordain ministers; but they possess no authority in the government of the church, except such as they derive from some other office. The presbyters are the derive from some other office. The presbyters are ordained stated munisters of the communities. degree of deacon is the first bestowed upon young ministers and missionaries, by which they are author ized to administer the sacraments. It is a general principle of the society, that their social organization is in no case to interfere with their duties as citizens and subjects of the governments under which they live, Where they form separate communities, they do not allow the permanent residence of any persons as house holders who are not members in full communion, and who have not signed the Brotherly Agreement; but they freely admit to temporary residence among them of such persons as are willing to conform to their external regulations. According to these, all kinds of amusements considered dangerous to strict morality are forbidden -as balls, duncing, plays, gambling of any kind, and all promiscuous assemblies of the youth of both sexes. In the continental communities to which unmarried u and boys not belonging to the families of the community resort, in order to prepare themselves for missionary or other labours, these reside under the care of an elder of their own class, in a building called the Single Brethren's house, where usually divers trades and manufactures are carried on for the benefit of the house or community; for it is a general rule with them that every member of the society devote himself to some useful occupation. A similar house, under the guidance of a female superintendent, is called the Single Sisters. house; and in larger communities there are also similar houses for widows who may wish to live aretired. Badd division of sex and station is placed under the special guidance of elders of their own description, who

# Bohemien Language

province it is to assist them with good advice and admonition, and to attend to their general interests. There are also special elders charged with the education of the young, as well as with attending to the spiritual attending to the s welfare of the married people. All these elders of both somes, together with the stated minister and the persons to whom the economical concerns of the community are intrusted, form together the board of elders, in whom rests the government of the community, with the concurrence of the committee elected by the inthe concurrence of the committee elected by the in-babitants for all temporal concerns. This committee superintends the observance of all regulations, has charge of the police, and decides differences between individuals. Matters of general interest are submitted to a meeting of the whole community. The female elders, though they attend the board of elders, have no vote in their deliberations. The most distinguishing feature of this body is their carnest and unremisely effects the diffuse a knowledge of Christianity to the efforts to diffuse a knowledge of Christianity to the most remote and neglected portions of the globe. It is this that has more particularly gained them the esteem of so many great and good men. "Who," says Dr. Chalmers, in reviewing the good that had been effected by their means, "would not long to be in possession the charm by which they have wrought this wonderful transformation,—who would not willingly exchange for it all the parade of human eloquence, and all the confidence of human argument." In 1851 the number of their chapels in England and Wales was 32, with 9,305 sittings. Though the entire number of members in that year did not exceed 12,000 in Europe, nor 6,000 in America, they had 294 missionaries and 70 settlements distributed among the Hottentots, Greenlanders. Requirement land, australian aborigines, and the negroes of the West Indies and America. The number of converts belonging to the missionary congregations was about 70,000. The annual expense of carrytions was about 70,000. The annual expense of carrying on this great work is only about £13,000, three-fourths of which are raised by other Christian bodies (principally by the Church of Eugland), who appreciate the value of their labours.

BOHEMIAN LANGUAGE AND LITREATURE. — The Bohemian language, termed by the people themselves the Czechish, is a branch of the Slavonic, and is spoken by about 7,000,000 of persons in Bohemia, Moravia, and Upper Hungary. It is one of the best dialects of the West Slavonic, and is distinguished from its sister dialects by the number of its roots, its great flexibility, precision of expression, and elegant grammatical con-struction. Like all the Slavono tongues, however, it wants a proper form of the passive voice. It is the most powerful and manly, but at the same time the hardmost powerful and manny, out at the same time the nare-est of the Shavonic hanguages. It is also distinguished by its precise and regular orthography, introduced in the 15th century by John Huss, in which, by the use of the Roman alphabet, every sound has a particular character assigned to it. What, however, chiefly dis-tinguishes it from most of the other European languages is, that here, as in the aucient tongues, the quantity prevails, while in the modern tongues it is the accent that governs. It is thus particularly well adapted to represent the various kinds of Greek and Latin metres. No other tongue can so completely and forcibly, and yet so naturally, convey the meaning of the ancient classics in translation as the Bohemian. Its grammar is more difficult to master than that of most other European languages, on account of its complicated forms and construction. The Bohemian literature is older than that of any of the other Slavonic tongues, ascending at least as early as the 10th century. Of the carliest period of its history, or that preceding the time of John Huss, several remains still exist. In 1917, Mr. Hanks, keeper of the National Museum, discovered at Königinhof part of a collection of epic and lyric poems of the 13th century, which are said to be characterized bygreat power, feeling, and tenderness. There remain, besides, of this period, about twenty poetical, and over Tensues, or anis period, about swenty poetical, and over fifty prices works, great or small. Among these are, Dalimil's "Bohemian Chronicle," in verse (1814); Thomas of Stiny's "Lehrbuch für seine Kinder" (1876); the still popular fable of the "Council of the Beasts; "Andrew of Dubs's work on the Judicial Council of the stitution of Bohemia (1402); and the comedy of the "Mountebank" (Quacksalber), about the beginning of the 14th century. John Huss, like Martin Luther, was

# Bohamien Langua

s reformer in language as well as in religion, and his time dates a new period of Bohemian Ricersis (1409—1526). He revised and improved the Bohemia translation of the Bible, and was the author of sea twenty books besides. Yet his influence on the likest ture arose less by what he wrote than by the vigo which he imparted to it. In the old libraries as archives lie, unknown and disregarded, almost innum rable tracts and treatises, dogmatic, polemical, and ascetical, by the different sects of Hussies of the 15th century. Poetry sank almost to mere rhyme, thaugh saccutars, by the different sects of Hussies of the tisting century. Poetry sank almost to mere rhyme, thrugh some of the church hymns of the Hussies are not without poetical merit. The prose, however, of this period became more fixed and expressive and was the only medium of all public transactions. The tistic papers, as well as the correspondence of the sistemen this period, are excellent specimens of a curt, clear, se, and expressive style. It is particularly rich in terse, and expressive style. It is particularly rich in national works; and of the historical works of this period, a number have been edited by Palacky in his Ser riod, a number have been edited by Falacky in his Scriptores Rerum Bohemicorum (1829). The period from 1526 to 1620 is called by the Bohemians the golden age of their literature. During it, particularly under the reign of Rudolph II. (1576—1611), all the aciences and arts were studied with diligence, and an attachment to the same was publicly manifested by all classes of society. Education was much attended to, and in Prague alone Education was much attended to, and in Frague alone there were two universities and sixteen other seminaries of education, among which were several girls'-schools; while throughout the country there were numerous gymnasiums and parish schools. The language reached its highest point, both grammatically and socially; and the number of works of every kind and obaracter that appeared during this period is very remarkable. Yet it cannot be said that the works of this time display any great amount of originality or genius. The fourth period begins with 1620 and ends with 1774, when, after the battle of the White Mountain, the whole Bokemian nation submitted to the conqueror. Perhaps never did the battle of the vinite mountain, are when a mation submitted to the conqueror. Perhaps never did a people so speedily fall from a high state of cultivation back to the deepest barbariam. The leading men of a people so speedily latt from a night state of curvessors back to the deepest barbarism. The leading men of the nation mostly perished by the sword; the clergy, scholars, nobility, and in general all the more cuttivated part of the nation, left the country. Their places were supplied by Italian, Dutch, Spanish, General and the nation, the nation, the country of the nation, the nation, the nation of the nation, and the nation of the man, and other adventurers, who came in troops, and possessed themselves of all dignities and offices. Jesuit missionaries went from place to place and house to house, accompanied by soldiers, in order to take and nouse, accompanied by somers, no root to take and destroy all hooks suspected of heresy. This unfortante destruction of books was continued far into the 18th century; and even so late as 1750 tho Jesuit Antony Konias boasted that he had destroyed 60,000 Bohenian books. It is therefore matter of wonder that we still possess so much as we do of the ancient that we still possess so much as we do of the sacismat literature. In the early part of this period these were still some writers who, indebted for their culture to the previous period, continued to shed a kind of light on this deep darkness; and many of them published works in Amsterdam, Berlin, Dreaden, and other places, and sent them to Bohemia. One of the last of these bright stars was Johann Amos Comenius, the last bishop of the Bohemian Brethren, and who is still known as a writer on education. In 1774 an imperial decree ordered the establishment of German schools—are all high and elementary, throughout Bohemia. normal, high, and elementary—throughout Bohemia; and in 1784 it was decreed, that in the higher schools instruction should only be given in German; so that one could only obtain the elements of learning in his mother tongue. This, which seemed to be a death-blow to the language, had in reality a contrary effect. It stirred to new life the alumbering energies of patriotic men in behalf of their mother tongue. General Count Francis Kinsky and the historian Pelzel were among the first to come forward and vindicate the claims of the unfortunate language; and they at length succeeded in obtaining some slight modifications of the decree, so that in the higher military schools instruction might be given in the Bohemian tongue. A number of the state of th ber of distinguished writers also arose, who made use of this language; as Pelzel the historian, whose work "Nowa Kronyka Czeska" (1791-96) is one of the best nowa Kronyka Czeska" (1781-96) is one of the best handbooks of Bohemian history; the monk F. F. Prochaska, Wenzel M. Kramerius, Dobrowsky, and others. The labours of these individuals at length led.

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# Bohemian Warwing

to an improvement in the state of matters; and in 1613 a decree was issued recommending the pas of the Boltonian language in the gymnasiums. Since that time a love of the old dialect has been rapidly extend-ing, and a knowledge of it has been diffused through ing, and a knowledge of it has been diffused through all classes of society. In poetry and belles-lettres, among the names that have recently arisen are Czelakowsky, Kollar, Holly, Lauger, Schneider, and others; in philology, Jungmann, Schafarik, Hanka, and Frest; in history, Palacky and Tomek; in archæology, Schafarik and Wooel; in geography, Schadek and Zap; in physics, technology, &c., Sedlakzek, Smetana, Ameriling, and others. Since 1831 there has been, in connection with the Bohemian museum at Prague, a special committee for the cultivation of Bohemian literature, numbering in 1849 4,000 members. It has aided in the publication, among other works, of Schafarik's "Slaronic Antiquities," and Jungmann's "Lexicon" and his "History of Literature." In 1851 there were published twenty-two Bohemia, five in Moravia, four in Hungary, and two at Vienna. Ref. Brockhaus Conversations Lexikon.

Bourman Waxwing, cair'-wing (Bombycicora garrale), a bird which is a winter visitant to Britain. The country in which the young are reared is not known

country in which the young are reared is not known with certainty. M. Temminck, however, states that the European waxwing breeds in the eastern part of the north of Europe, and lives in the northern parts The waxwing is about the size of the starling, of Asia. The waxwing is about the size of the starring, and is distinguished more for its pretty plumage and

graceful form than for superior vocalization.

Boil, boil, called also furunculus, from the Latin furo, I rage, on account of the violent heat and infismmation attending it, is a hard painful tumour of the skin and the subjacent cellular tissue. It makes its appearance as a small hard inflamed spot on the skin, and gradually enlarges into a painful tumour, having a white conical centre, surrounded by a hard inflamed base, and varying in size from the bulk of a pea to that of a pigeon's egg. It proceeds to suppuration, and discharges a few drops of purulent matter commonly mixed with blood, and a central mass called commonly mixed with blood, and a central mass called the core. This last often lies deep, and causes con-siderable pain before coming away; but, without its removal, the abscess will not heal. Boils, though generally very troublesome, are not attended with danger. They occur mostly in young and vigorous persons; but they also occasionally break out upon the weak and deficate. They sometimes flow each other in rapid succession, and are most common in the apring. They all take their rise in some disordered state of the digestive organs; and the need to more disordered state of the digestive organs; and hence it is necessary that the bowels be at first freely opened, and then regulated by gentle unirritating laxatives. The diet should be plain and simple, and stimulants ought to be avoided. In delicate constitutions a course of sarshould be plain and simple, and stimulants ought to be avoided. In delicate constitutions a course of sar-saparills will be found of great use. In dealing with the boil itself, suppuration is to be hastened and per-fected by means of linseed-meal poultices; and as soon as the prominent part of the swelling becomes soft, a free opening should be made into it with a lancet, and as much matter as can be pressed out of it by tolerably firm pressure should be removed, together with the core; or the poultices should be continued until the core is drawn out, when the wound will speedily heal.

Boller, boil-er, a name applied to vessels in which water or other fluids are exposed to heat, for the purpose of exporation, or for the formation of steam.

Small boilers are mostly made of copper; larger ones of the best wrought iron. They are of various shapes, being generally constructed so as to obtain the largest heating surface with the smallest cubical contents. (See STEAM-ENGINE, LOCOMOTIVE, SUGAR-REFIRING.) By the continual evaporation of the water in steam boilers, the saline matter contained in it, at last becomes so concentrated, as to form a deposit open the sides and bottom. In many instances, especially when the water used is greasy, this deposit has been the cause of explosions, from covering the iron so tightly as to allow it to become red hot all through.

# Boiling-points

the purpose of preventing the formation of these incrustations. The addition of chloride of ammonium to the water in the boiler, as proposed by M. Ritter-brandt, is very effectual. The chlorine combines with the lime, and the carbonic scid with the ammonis, forming chloride of calcium and carbonate of summonis, two very soluble salts. Chloride of tin and alkaline carbonates are also used for this purpose.

Boiling-points, boil-ing points.—A liquid is said to

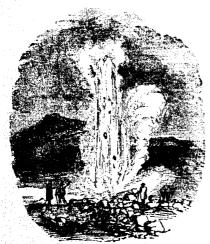
boil when it is made to assume a constant state of chullition by the formation of bubbles of its vapour by means of heat. The boiling-points of liquids differ seconding to their chemical constitution; in many instances, in direct ratio to the differences in their composition. The boiling-point of the same liquid may vary under different circumstances; such as the pressure on its surface, the amount of attraction exerted by the vessel containing it, or by salts held by it in solution. Boiling, or the emission of steam in bubbles, consists in the formation of a vapour of equal elasticity to that of the atmosphere, which exerts its pressure on the surface of the liquid. It therefore follows, that any lessening or increasing of the pressure of the air is accompanied by a corresponding depression or elevation of the boiling-point. This fact is made evident by the familiar experiment of placing warm water under the receiver of an air-pump, when, on exhausting the air, ebullition takes place, from the diminished pressure. Liquids, in general, boil from 60° to 140° lower than their ordipary boiling-point when heated in vacuo. This property is made use of in the manufacture of certain medicinal preparations, the properties of which would be destroyed by exposure to a temperature of 212°. Advantage has been taken of this property of fluids in the measurement of heights. M. Saussure found that on the summit of Mont Blanc, which is nearly three miles above the level of the sea, water boiled at 185° Fah.; and M. Wisse observed the boiling-point of water to be 1850 Fah. on Mount Pechinchs, while the barometer stood at 17 inches. From these facts it has been calculated that for every difference in height of 596 feet, a variation of 1° Fah. in the boiling-point is produced. It has also been ascertained that a variation of one-tenth of an inch in the barometer produces a difference of more than a twentieth of a degree Fah, in the holling-point. The contrary property of increase of pressure causing elevation of the boilingpoint, is evident from the above considerations. Pa-pin's digester is an example of this. By confining water in an air-tight vessel, it may be heated to a temwater in an air-light vessel, it may be nested to a tem-perature only limited by the strength of the vessel. This property is taken advantage of in the preparation of gelatine from bones, which are heated to a tempera-ture much higher than 212° Fah. By this means the gelatine is easily separated from the earthy matter, although the bones might be boiled for hours at 212° Fah. without any such effect taking place. The attraction of a fluid for the surface of the vessel in which water boils at 212° in a metallic vessel, in a glass vessel at 214°, while in a vessel varnished inside with shell-lac the heat may be raised to 2200 without chul-lition taking place. The influence of salts held in solution is very marked. A saturated solution of chlorate of potash, i. c. containing 01 5 per cent. of the sait, boils at 220° Fab.; a saturated solution of chloride of calcium, containing 325 per cent. of the salt, boils at 355° Fah., while a saturated solution of acetate of potash, containing 798 per cent. of the salt, botle at 336° Fah. It will be seen from these examples that the quantity of salt contained in the liquid does not directly influence the boiling-point. From the experiments of Kopp and others, it has been discovered that an exact ratio exists between the chemical constitution of certain liquids and their boiling-points at the same pressure. Thus methylic, ethylic, propylic, and butylic alcohols differ from each other by an increment of CaH2, and their boiling-points differ by an increment of 31.4° Falt. Another example of this is shown in the hydrocarbons benzole, toluole, xylole, and ex-mole, the difference in their composition being C.H. so against as to allow it to become red hot all through. I mole, the difference in their composition being C.H...
The incrustation, on being exposed to such a temperawhile the difference of their boiling-points is 41° Fab.
tare, creaks, and the water, suddenly submitted to the The same relation runs through the acids, ethers,
best of the red-hot metal, bursts into gas, an exploslidelyds, and saits of these bodies. The following
tion being the result. Many remedies are in use for itable of the bodiing-points of different liquids is partly
30°s

## Boiling Springs

compiled from those given in the first and third volumes of Miller's "Rlements of Chemistry," to which work the student is referred for very complete details on these points.

			for the second	
Protox	ide of Nitre	gen		157
Carbon	ic Acid		—	108
Cysnos	611		-	7
Sulphu	rous Acid		+	17.6
Objecte	Ether			51.9
Aldehy	d	*********	***********	69.4
		******		94.8
		**************		105.8
Bisulph	ide of Carl	on	******	118.5
Terchlo	ride of Sili	con	*********	138.2
Bromir	ıe			145.4
Wood	Spirit			149.9
Acetie	Ether			164-9
Alcoho	l	****		173.1
Benzol	8			176.8
Dutch	Liquid			184.7
Water.	B. 29 92 i	n <b>s.</b>		212.0
Formic.	Acid			221.5
Acetic	Acid			243.1
Fourei	Oil	<b></b>		269.8
Terchic	ride of Are	enic		273.0
Buternie	. Anid			214.0
Terbro	mide of Ph	osphorus	***********	347.5
Sulphu	r	• • • • • • • • • • • • • • • • • • •		609
Bulohu	ric Acid		*****	619
Mercui				662
Water	in vacuo (I	homson)	***********	98
	B. 16.6 ins			184
27	B. 20.6 ins.			194
	B. 25.4 ins.			204
				215
**	under a pre	ssure of 2 att	nospheres	249
"		,, 10		
••		20	••	415.4
Saturat	ed Solution	of common	Salt	227
	49			
"	"	Nitrate o	f Lime	304
,,	**	Acetate	of Potash	336
	**	Chloride	of Calcium	355
e EBULL				

BOILING SPHINGS, OF GRYSERS, the name given to sertain springs in Iceland, where boiling water is



## Bollar dists

it a nearly circular basin, upwards of fifty feet in diameter, it slopes towards the centre like a samer, and has an average depth of five feet. In the middle is a cylindrical passage, about seventy feet deep and twelve feet in diameter, up which the boiling water rises and the eruptions burst forth. These eruptions rises and the eruptions nurst form. These crapsome cocur at periodical intervals, and are proceeded by a loud report like that of artillery. Sir John Stanley, in describing this spring, says that the water in the basis was first violently agitated, and the ground shaken; the air was then filled with volumes of steam, rolling over each other as they ascended in a manner inex-pressibly beautiful, through which columns of water, shivering into foam, darted in rapid succession to the height of nearly 100 feet. It has been ascertained that neight of nearly 100 feet. It has been ascertained that the boiling springs of Iceland have been playing for the last 600 years; but very material changes have taken place from time to time amongst them. They have doubtless a connection with the volcances which abound in the island; and their temperature varies from 188° to 212° Fahrenheit. The inhabitants of Iceland use them for bathing when their position suits and also for boiling fish, evaporating sea-water, and such-like purposes.

BOLDERBERG BEDS, boll-der-bairy, in Geol., a typ cal group of tertiary sands and gravels occurring in the Bolderberg hill, about 40 miles from Brussels.

Bole, Armenian, bole (Swed. bol), a dark-red hydrated silicate of alumina, mixed with peroxide of iron in large quantities. It also contains traces of hime and magnesis. It is occasionally used for coarse paint and for stage purposes. When the amount of mag-nesia is such as to cause it to feel greasy, it is termed

mountain scap, or fett-bol.

Bour, in Geol., a term sometimes applied to any friable clayer shale or earth coloured red or brown by

peroxide of iron. Bolero, bo-lair'-o (Span.), a Spanish national dance, usually accompanied with the castanets and the cithers, and sometimes with the voice. The dance is intended and anometimes with the commencing with corporate and diffidence, and gradually rising to the expression of passionate cestasy. It is in the time of a minuet, and has a marked and singular rhythm.

Bolerus, hole-tus, in Bot., a gen of fungi, which may be distinguished from Agaricus by the absence of gills, the under-side of the cap or pilous being covered by a porous layer composed of innumerable short tubes united together. Some of the species are edible, though they are all set down as mere toadstools by the mushroom-gatherers of this country. B. edulis, the Ceps ordinaire of the French markets, is much used throughout the European continent. It grows in woody situations and attains a considerable size, the cap being usually six or seven inches across. The colour of the cap ranges from light brown to brownish-black, white that of the layer of tubes beneath is at first white, then yellow, and finally yellowish-green. The stem is thick, solid, and beautifully reticulated. To prepare the fungus for the table, the layer of tubes, the skin, and the stem, must be thrown away, for nothing but the firm and delicate flesh of the cap is to be eaten. This may be either caten raw with salt and pepper, or cooked like a common mushroom. Many other species are usually found exposed for sale in the French markets.

BOLLANDISTS, boll-lind-ists, a society of Jesuits at Antwerp, who are celebrated from having undertaken the publication of a work entitled "Acta Sanctorum," which was to give all that was known concerning the saints of the Roman Catholic church. The work was projected by Heribert Rosweyde, but he died before projected by Heribert Rosweyde, but he died before any part of it was ready for the press, and was succeeded by John Boliand, who gave his name to the society, and by whom the two first volumes (for January) were published in 1643. The three for February appeared in 1653, and the three for March in 1668. In consequence of the suppression of the order of Jesuits in 1773, this society removed to the Augustine abbey of Caudenberg, at Brussels, where it continued till the accession of Joseph II., which led to small plain, sixteen miles north of the willage of Skalholt. The street of the Great Geyser have formed for S00 feet high and 10 feet in diameter. The silicious deposits of the Great Geyser have formed for 300

### Bollards

# Bolognese School of Painting

(1784) when the French accupation put an end to their labours. In 1837 a new Bolkendist association of Jesuits was instituted by the Belgic government, which act maids an animal sum of 6,000 frames for carrying on the work; and in 1845 the 54th volume appeared. Since that time two more volumes have been published, the last in 1858, bringing the work down to the 22nd of October; and, when finished, it is expected to occupy 70 large follo volumes. It was estimated that the 53 volumes published before the French revolution consin upwards of 25,000 lives of saints. From being sarried on by so many different hands, the work is of vary unequal merit, and though abounding in legends and absundities, they contain much valuable historical information, and the documentary evidence is often new above and on the documentary evidence is often

The salty and honestly criticised.

\*\*BOLLAMOS, bol'-tards (Ang.-Sux.), in Mar., are large posses sunk in the ground on each side of a dock. On socking or undocking ships, large blocks are fastened to them, through which are passed the transporting hawsers to be brought to the capstans.

BOLOGNA PROSPHORUS, bo-lone'-ya.—Sulphate of baryts on being ignited with a small portion of carbon, and exposed to the sun's rays, acquires phosphorescent properties, and is called Bologna phosphorus, from having been first discovered in that city. The explanation

nation of this phenomenon is not very clear.

BOLOGNESE SCHOOL OF PAINTING, bo-lone'-yes-ze. \* resemblance in style and manner among painters who have become masters of their art in any locality, during a series of ages, whose works present a similarity of treatment, not arising from a deficiency of original ideas, but from the influence of situation and general ociations, and the example of great minds that have a to a point considerably above the level of those who have gone before them, who have thus contributed to establish a higher degree of excellence, which is worthily imitated and adopted by their followers and beesors. But merely considering the term to point est the associated names of a certain number of painters of selebrity, who either claim a town renowned for the production of brilliant works of pictorial art for their birthplace, or, coming from elsewhere, have settled and wrought there, associating their names inseparably th the place which they have chosen as the scene of sir studies and labours,—whose various productions, ressons above stated, have become imbued with a milarity of style, feeling, and expression,—it will milestly be requisite only, in the present article, to size briefly at the various masters who adorned the Beloguese school in successive centuries, pointing out their progress towards excellence, by a judicious selection and adoption of the most meritorious points in the odnotions and styles of eminent masters of other hools, and the time at which the highest degree of rection was attained. In the 14th century, Franco f Belogna, called the Giotto of the Bolognese school, Stained a high reputation as an illuminator of missals. He also painted pictures of some considerable size, someder of the school of his own ers, with whose style and spirit the works of his contemporaries and sucsessors became deeply imbued. Specimens of their works still exist in the church di Mezzarata. At the commencement of the 15th century, Lippo Dalmasio, whose chief subject was the Virgin, from which prediction he is known as Lippo delle Madonne, or Lippo of the Madonnes, attained a reputation for the expression of piety, combined with grandeur of treatment, that he threw into his works, caused, most probably, by the influence which the Byzantine school of art exercised over the early Italian painters. (See By-SANTINE SCULPTURE.) An attempt made subsequently to introduce the style of treatment adopted by Venetian stists, by Marco Zoppo, who painted between 1470 and 1500, seems to have failed; and the name of Francesso Francia, a contemporary of Rafaelle, whose bistory bears certain points of similarity to that of in Matsys, as both were originally artificers in metals, and adopted painting as a profession in after-life, closes the century as the most celebrated of his school, famous for the boly and pure expression of countemance given to his Madonius; he has been and by some writers, though improperly, with con-

temporary painters who reached for greater emineuses in other schools. The next painters of reputation in the Bologness colool who flourished in the 16th contary, were Ramenghi (named Bagnacavallo), Innocense da Imola, Primaticcio, and Pellegrino Tibaldi. The first of bless introduced. of these introduced an imitation of the style of Refaelle into his works, which was copied by his pupils; while the last-named, after passing his early years in the studio of Bagnacavallo, studied under Michael Angelo at Rome, and infused much of the spirit of this wonderful painter and sculptor into his works. But the ex-cellence of the Bolognese school, that had hitherto only sought to combine the successful modes of treat-ment adopted by Rafaelle, Michael Angelo, and other ment adopted by Kanene, Attended Angelo, and cater artists of eminence, in a manner approaching servility and mere superficial mannerism, was shortly to reach its culminating point in the productions of Ludovico Caracci (see Caracci et al. of this work), and his cousins, Agostino and Annibale, as well as in those of their scholars and contemporaries, Guido and Domenichino, who had previously studied under Dermit Calchino, who had previously studied under Dermit Calchino. chino, who had previously studied under Denis Cal-vart, a painter of Antwerp, who had settled in Bologna, and had introduced a taste for landscape-painting, which exercised a manifest effect on the works of the painters that have just been mentioned. Ladovico Caracci, who seems to have been influenced in a great degree by the paintings of Correggio, regarded at that time by all existing schools as a model of excellence well worthy of imitation, after studying at Venice and Parma, determined on the introduction of a new style, in which his cousins were persuaded to assist. The chief characteristics of this new element in the Bolognese school seem to have been a careful observation of nature and natural effects in conjunction with the imitation of the various styles of the great masters, and a proper attention to correct outline-drawing, perspec-tive, and the anatomy of the human figure, which had been neglected by the predecessors of the Caracci. An impulse in a fresh direction was thus given to the art of painting, and the labours of Ludovico at Bologna, and of Annibale at Rome (the best exemplification of whose powers as an artist, and of the peculiar characteristics of the Caracci school, is to be found in the Farness palace, in a series of frescoes), imparted a new colour-ing, and exercised a decided influence over works of art produced about 1600, and for many years subsequently, throughout Italy. The leading features of Ludovico Caracci's paintings, as given by Sir Joshua Reynolds, are—great breadth of light and shadow; simplicity of colouring, which has the merit of not drawing away the attention of the spectator from the subject of the painting; and a ruellow wilight effect that seems to be diffused over his pictures, and is in perfect harmony with the grave and dignified subjects which he close for treatment. Domenichno was brought into notice by Poussin and Annibale Caracci, though this painter, as well as his cousin Ludovico, was jealous of the superior talents of his pupil Guido, who combined the dark peculiar style of Caravaggio with that of his former masters, but afterwards adop a lighter and more lustrous tone which pervades his productions. Among other followers of the Caresci and painters of the Bolognese school may be enumerated Guercino, Lanfranco, Tiarini, Lionello Spada, and Cavedone. Since the middle of the 17th century no painter of eminence has been found in this school to sustain the reputation which had been acquired for it by the Caracci and their pupils, with the exception of Carlo Cignani, who was mainly instrumental in founding the Clementine Academy of Bologus, in which he sought to combine the study of the old masters with a careful observation of nature and attention to anatomical science. The following is a list of some of the tonical science. The following in late of season take paintings by Bolognese masters in the National Gallery, attording good examples of their different peculiarities of style and method of execution. Name of Artist. Born. Died

Name of Painting.	Rame of Artist. Born.	
8t. John in the Wil-	Annibale Caracci 1500	1609
Temptation of St. An-		 •>
Martyrdom of St. Ste-	Domenichino 1581	1641
Rece Homo	Guido 1575	1642
Venus attired by the	<b>, ,,</b>	**
C'hwist.	Guercino 1590	
Repose of the Hely	Pietro F. Mols 1612	1668

BOLSTER, bole'-ster (Sax.), a long cushion used for supporting the heads of persons lying in bed. In sad-diery, bolsters are hose parts of a saddle raised upon the bows or hinder part, to hold the thighs of the rider. In Mar., certain cushions or hags stuffed with tarred canvas are called bolsters. They are used to protect the stays from being chafed or worn by the motion of

the masts during the rolling of the ship at sea.

BOLT, bolte (Sax. bolt; Goth. bolte, a fetter).—In Mar., bolts are short cylindrical pieces of iron or copper, varying in diameter from half an inch to three inches, and of various lengths, used for securing the timbers of a ship to the ribs, and for fastening the knees, beams, and various parts of the vessel together. These bolts differ in form according to the purpose for which they are designed, and are distinguished by shipwrights according to the form of the head. The term wrights according to the form of the head. The term "bolt" is variously applied; a sliding bar of iron fitting into a socket to accure a door, and the short arrow with a weighty head discharged from a cross-bow, are An iron fetter is sometimes called a fetterbolt, particularly in Her.; and a piece of sailcloth twenty-eight ells in length is called a bolt of canvas

BOLTHEAD, bolt'-hed, a glass vessel consisting of a globe with a long narrow neck, used in chemical ope-

rations for boiling and subliming.

BOLT-Ropes, in Mar., the name applied to ropes
which are attached to the edge of a sail to prevent the canvas from splitting and tearing when there is a heavy strain upon it. That part which runs along the upper edge of the sail is called the head-rope, that along the lower edge the foot-rope, while that which is sewn to the edge on either side is termed the leech-rope.

Bolus, bo-lus (Gr. bolos, a mass), a large soft kind of pill, larger than a common pill, but yet not too large to be swallowed at once. It might be composed of any of the ingredients used for pills; but it was an incon-

venient form, and is now generally discarded.

Boun, bom (Gr. bombos, a loud noise), a very de structive missile used in warfare. It is usually in the form of a hollow sphere or shell, made of cast-iron, and illed with combustibles. There is a communication between the interior and exterior by a vent-hole, through which a fusee passes. When a bomb

is fired out of a mortar or gun, the fusee is lighted and burns slow-

ly, only reaching the interior powder as the bomb falls; the mass of metal then bursts,





BOYE.

the fragments working great havor as they fall amongst the enemy. Bombs were formerly only fired from mortars; but since the late improvements in artillery they have been much fired from guns and howitzers. The name of shell, or bomb-shell, is principally used to distinguish this kind of implement, notwithstanding the shape has changed in some cases from the sphere to the cylinder or

cylindrical cone. (See SHELL, ARMSTRONG GUN.) The Venetians claim the invention of the bomb as early as 1878; but it did not come into common use in warfare thi 1634, and then only between the Dutch and sanish armies. An English engineer named Malthus said to have first introduced bombs into France at enish armies. siege of Collioure in 1793.

Born beaut

After the cruel bombardmen Messina, in 1848, when so many lives were lost and much property destroyed, Francis II., king of Nam and Sicity, acceived the nickname of Bombs. His sen, who succeeded him, is sometimes called Bombslino. After considerable resistance, he was driven from his throne by Garibaldi and Victor Emmanual, who took the title of king of Italy.

BOMBLORE, bom-bai'se-e, in Bot., a group of plant now usually regarded as a tribe of the nat. ord. Size

now usually regarded as a tribe of the nat. ord. Marsiculiacea. It comprises several interesting general; namely, Adansonia, Bombax, Cheirostemon, Dario, Eriodeudron, and Ochroma, which are separately described in this work.

BOMBARDIER, bom-bar-deer, a non-commissioned officer in the artillery, corresponding in rank to a lance-corporal in the line, and distinguished by wearing one chevron on the left arm. In former times artillery-men so cutifled were especially employed in stilling shells and grandes, and preparing forces. filling shells and grenades, and preparing fusies, as well as in serving mortars and other pieces of ordnance from which shells are thrown during the siege of a town.

BOMBARDINE BERTLE, a name applied to many co-leopterous insects of the tribe Carabida. They are divided into two genera,—the Brackinus and the Ap-tinus; the latter has no membranous wings under the wing-sheath. Those found near the tropics are large and brilliantly coloured, but those found in this coun-try are generally small. They are called bombardies beetles on account of a remarkable property they possess of violently expelling from the anus a pungual acrid duid, which, if the species be large, has the power of producing discoloration of the skin, similar to of producing discoloration of the skin, similar to that produced by nitric acid. It also changes blac-vegetable colours to red, and then to yellow. The most common English species is little less than half an inch long: if irritated, it will make more than twelve rapid discharges. Each expulsion of the finid is accompanied by a very lond report, considering the size of the insect. The hombardier beetle is generally found under stones, and occurs plentifully in chalky, districts. districts.

BOMBARDMENT, bom-bard'-ment (Ital. bombarda-mento), the expression applied in Mil. to the ect of throwing red-bot shot, shells, and congreve rockets into a fortified town, to effect the destruction of powder-magazines, dockyards, warlies stores, buildings of a public character, and private dwelling houses. A bombardment is invariably attended with terrible destruction of human life and property, and is resorted to in order to induce the governor or officer in command. to save the inhabitants from death and ruin by capitulation. It finds little favour with military and naval men, on account of the misery with which such a process is attended to those who are not actually in arms against the attacking force; and is seldom put in practice unless the place cannot be reduced by a regular siege. During the siege of Sebastopol, in 1854-5, a furious bombardment of the town and defensive works was bombardment of the town and derenaive works was kept up for some days, at six successive periods of the fivestment, in the last of which, justly characterized by the Russian governor, in his dispatches to the em-peror, as a feu d'enfer, about 28,600 red-hot shot and shells, with other missiles, were hurled into the heart of the city and against the fortifications. Some idea of the expense attending a bombardment may be con-ceived from the fact that nearly 252,000 rounds of shot and shell were expended during the siege, besides those fired from the vessels surrounding the entrance to the harbour, which represents a mass of above 8,000 tons of iron, supposing each shot to average three-quarters of a hundredweight. Among the most famous bombardments mentioned in history, are those of Gibraltar, by the French and Spaniards, from 1779 to 1783; Havre, by Admiral Rodney, and Lille, by the Austrians, in 1793; Copenhagen, by Lord Nelson, in 1891, and again by Lord Catheart and Admiral Gambier, in 1807; and

Algiers, by Lord Exmouth, in 1816. BOMBAST, bom-bits', in Lit., is an attempt to raise an ordinary or trivial object to the rank of the sublime, or to exalt a sublime object beyond all natural or res sonable bounds,-

" My roof receives me not; 'tis air I trea And at each step I feel my advanced head. Knock out a star in heaven."—Ben Joneon. BOMESK, bom'-box, in Bot., a gen. of plants, the type of the tribe Bumbaces. The species are natives of South America and India, and are commonly known as silk-cotton trees, owing to their seeds being covered with long silky hairs. These hairs cannot be spun into thread, like those of ordinary cotton; but they are sometimes used for stuffing heds and cushions. The American tree B. Cellos, and the Indian tree B. pentandrum, are remarkable for their prodigious height. The bark of the latter is said to be emetic.

BOXBAZINE, bom'-bū-zeen (Gr. bombyx, a silkworm), is a woven fabric, the warp of which is silk and the weft wood. The manufacture was introduced at Norwich by some Dutch weavers, who settled there in 1575. Bombasine was at first made in different colours; but

of late years it is only used in deep mourning.

Bourse Acro, bom'-bik, an acid formed by silkworms, analogous to, and most likely identical with, that obtained from ants, and called formic scid. (See FORMIC ACID.)

BOMB-KETCH, a vessel built and strengthened with large beams, equipped with two masts, and fitted with all the conveniences and appliances for the use of morters at ses. These vessels are usually about 100 to 250 tous burden. (See MORTAR-VESSEL.)

BOME-PROOF, a term applied to military structures which are so constituted that any missile discharged from a gun, as a bomb-shell or cannon-ball, cannot penetrate them. Magazines are constructed bombproof, and are generally made very strong; and case-mates are bomb-proof vaults in fortresses, for the security of the defenders.

BOMBYX. (See SILEWORM.)

BONA FIDES, or BONA FIDE, bo'-na fi'-dees (Lat., good faith, or in good faith), an expression frequently used to denote a thing done with an honest intention, in opposition to one done with a bad or deceitful intention, said sition to one done with a bad or decentin intention, said to be malé fide. The phrase originated with the Romans, who classed under bonæ fidei obligations a great variety of contracts, as well as of legal acts. Actions bonæ fidei were distinguished from those stricti juris; the former having regard to the honesty of the intention, the latter to the strict legal terms of the deed. The distinction was somewhat analogous to that which prevails between courts of law and courts of equity in England.

BONA NOTABILIA.—Where a person dies, having, at the time of his death, goods in any other diocese be-sides his goods in the diocese in which he dies, amounting in value to £5 in the whole, he is said to have bona notabilia. They consist of simple-contract debts, specialties, judgments, leases of lands or houses, &c.

BONASSUS. (See RISON.)
BOND, bond (Sax. bond, bound or tied), in Arch., a term applied to certain methods of laying bricks (see BRICK-WORK), and to timbers built into or attached to the walls of a house for various purposes. Stones are called bond-stones when they are introduced longitudivally into a wall built of small rough stones or rubblework. Bond-heart, in building, is when one stone is placed in the centre of a thick wall, over the joint formed by two others, the outer faces of which appear opposite to each other on either side of the wall. Bond-timbers are pieces of wood let into the sides of openings for doors and windows, to which the windowframes, jambs, and architrave of the doors and architrave-mouldings, may be nailed, and the long slips of timber built into a wall in a horizontal direction, at intervals of eighteen inches or more, to which the battens are attached

BORD, or Writing Obligatory, a kind of contract in very extensive use, being adopted, in a great variety of cases, where the object is to obtain security for the payment of money, or the performance of any other set; being a deed, or instrument under seal, whereby a party from whom a security is intended to be taken, a party from whom a security is intended to be taken, obliges himself to pay a certain sum of money to another at a day specified. If this be all, the bond is saided, a single one (simplex obligatio); but there is generally, indeed in practice invariably, a condition added, that if the obliger does some particular act, the obligation shall be void, or, else, shall remain in full farre. The nature of this act depends upon the par-ticular object intended to be secured. Thus, it may be the repayment of a principal sum borrowed of the

obliges, with interest, the periodical payment to him of an annuity, the faithful performance, by a third party, of the duties of an office or employment under the obligee, the performance of covenants by the obli-gor, the indemnity of the obligee against loss, or the consequences of certain acts, and a variety of other matters; but whatever the nature of the act, the penalsum (or penalty) mentioned in the obligatory part of the bond becomes forfeited, or absolute in law, and charges the obligor, while living, and, after his death, his executor or administrator, and (subject to certain distinctions) is also capable of being enforced against his heir or devisee. If the coudition of a bond be impossible at the time of making it, or be uncertain or a possible at the condition along its said which are also as the condition of the condit insensible, the condition alone is void, and the bond shall stand single and unconditional; for it is the folly of the obliger to enter into such an obligation, from which he can never be released. But if the condition be to do a thing which is either illegal at common law, or contrary to the provision of an act of parliament the whole bond is void; for the whole is an unlawful contract, and the obligee shall take no advantage of such a transaction. If the condition, at the time when the bond is executed, be possible and legal, and after-wards becomes impossible by the act of God, or that of the obligee himself, or becomes by any means illegal, the penalty of the obligation is, in any of these ca saved, and the obligor discharged from all liability; for no prudence or foresight on his part could guard against such a contingency. But although the whole penalty, by breach of the condition, may become payable, the courts will confine the liability to the actual amount due, or the actual damage sustained by the breach.

BOND, POST OBIT, is a bond in which the main con dition is, that it only becomes payable after the death of some person whose name is therein specified.

BONDAGE, bond'-aj, properly denotes a state of servitude or slavery, and by English law-writers it is used in the same sense as villenage. Bondage by the forelock was when a freeman renounced his liberty and became the slave of some great man, which was done by cutting off a lock of hair on the forehead and delivering it to his lord. Such an one, if he reclaimed his liberty or escaped from his master, might be drawn again to his servitude by the uose; whence the phrase, To pull a man by the nose. The Romans had two kinds of bondmen,—the servi, who were either bought, taken in war, or acquired in some other lawful way; and verne, those born of their bondwomen. Justinian mentions a third class, called adscriptititi gleber, or agricantit, who were a species of serfs or boors, not bound to the person, but to the ground or place, and belonged to him who possessed the land. These, by our law, are termed villain regardants.

Bone, bone, in Anat., is a hard complex structure. forming the framework or skeleton of the body in man and the higher animals. It is confined to vertebrate animals; and even in the lowest order of this class. bones form a framework for the moulding and adethe cartilaginous fishes, it is entirely wanting. quate support of the soft parts of the body; cavities for the lodgment and protection of delicate organs: joints for locomotion, and levers for the action of the muscles. They are always in the interior of the body and even when they approach the surface are covere by some soft membrane, muscle, skin, &c. The first development of bone is commonly—though not always, as in the bones of the head—preceded by the formation of a cartilaginous structure, occupying the place which the bone is afterwards to take. It has commonly been said that the bone is formed by the ossitication of the cartilage; but this, for various reasons, is thought not to be the case. The process of bone-formation always commences in the immediate neighbourhood of blood-vessels, which pass down into canals excavated in the substance of the cartilage, and lined by a continuation of its investing membrane. Hence the spots where these vascular canals are especially developed are termed centres of ossilication. One of these is are termed centres of ossification. One of these is usually found in the centre of the shaft of a bone, and one at each end, with an additional one for any considerable projection or process. In the flat bones there is generally one in the middle of the surface, and one in each of the principal processes. Until the bone

astains its full dimensions, the parts which contain distinct centres are not connected by osseous union, but only by cartilage, so as to allow an increase in the size of the hone by the growth of cartilage between its detached portions, which gives place to bony structure when there is no further need of increase. There exists a close correspondence between the number of ossific centres in the early condition of the skeleton of all vertebrated animals. The growth of bone is effected by the addition of new tissue in three different modes : 1. By the development of new bone in the cartilage between the parts yet remaining separated; 2. by the development of new bone in the membrane covering development of new hone in the membrane covering the surface; and 3. by the interatitial formation of new layers within the canals of the osseous fabric already developed. The perfect reparation of bone after severe injuries, effected by the development of new osseous tissue in the substance of membrane or cartilage formed in the seat of injury, is one of the most remarkable features of its character. Bones are so constituted that a constant process of deposition and absorption is carried on in them, as in the softer diseass, modelling the shaft into its requisite proportions during the successive stages of growth. much more actively carried on in youth than in middle life, and is greater in the vigour of manhood than in old age. Bones increase in length not so much by interstitial deposit, as by addition to their ends; that is, by progressive ossification of the layers of cartilage which intervene between the ends of the shaft and the epiphyses. Bones are largely suppned with photo-recovery. The solid osseous texture which forms the cylindrical the thick external plates shafts of the long bones and the thick external plates of the denser flat bones is penetrated by a series of inrge canals, termed Haversian (after their discoverer). which form a network in its interior, and serve for the transmission of blood-vessels into the interior. These causis, in the long bones, run for the most part in a direction parallel to the central cavity, and communicate with this, with the external surface, and with each other, by frequent transverse branches. They vary in diameter from the to whom of an inch, averaging about the bone is most compact; but become gradually larger towards the interior. In the long bones of man and of most mammalia there is a central cavity, which is filled with the fatty substance known as marrow; and the space in which the marrow lies is called the medullary canal. This cavity does not exist in the bone in its early state, but is formed by the removal of the cancellated osseous tissue first developed in its interior. Among birds, however, the central cavity, instead of being occupied by marrow, is filled with air, and communicates with the lungs; so that the membrane lining it becomes an auxiliary organ of respiration; whilst the lightening of the bones thus produced diminishes their specific gravity. Bones are covered externally by a strong fibrous membrane termed the periosteum, which serves to protect the blood-vessels entering them. The medullary canal is also lined by an extremely delicate membrane, termed the medullary membrane, which supports the marrow, and provides a stratum for the subdivisions of the medullary artery before they penetrate the contiguous osseous substance. The Haversian canals are also lined by a similar membrane. Though bones possess little sensibility in health, yet, when diseased, they become highly sensitive, a manifest indication that they are supplied with nerves. These may, indeed, he traced into some of the minute foramina on the shaft of a long bone, but more easily into the articular ends. nerve also enters the medullary caral with the nutrient artery of the medulla, and divides, like the artery, into an according and a descending branch. Bone is composed of a basis of animal matter, imprepated with "bone-earth," or phosphate of lime. The first ingredient makes it tenacious and elastic; the second gives it the requisite hardness. These may be separated from each other: the latter may be entirely dissolved away, by soaking the bone in dilute muriatic or nitric acid, when a substance of cartiliginous appearance is alto a market of the former, by subjectify the bone to a heat tordicent to decompose the animal matter, when we obtain the whole calcareous substance in situ. The bone manure has been known to raise the value from the satural portion of a bone forms about one third, the loss to 40s. per acre. In 1859 Great Britain imported

earthy about two thirds; and the relative propos of the two elements is said to differ little in diffe of the two elements is said to differ little in different classes of animals. It is not yet a settled point whether the proportions vary at different periods of life; has the general opinion is that they do, the animal alement predominating in early life, the earthy in old age. The bony framework of the higher classes of vertebrate animals presents very nearly the same chemical cha-racteristics in most individuals. Bones, when dried at 212° until they cease to loss weight, consist of one third ossein, or organic matter, and two thirds of phosphate ossein, or organic matter, and two thirds of phosphate of magnesia. Ossein, when boiled in water, gradually dissolves, leaving a small quantity of fatty and vascular matter floating on the solution, which, on cooling, gelatinizes, forming a weak glue or size, consisting of nearly pure gelatine. The earthy matter may be separated from the ossein, either by means of an acid, or else by boiling in water in a Papin's digester, at a temperature over 300°, the gelatine being only dissolved at that heat, (See Boiling-Points.) The mineral constituents of bone are used as manure and in the manufacture of cupels. (See Bonk-Ash.) When bones are distilled in close vessels, at a gradually increasing temperature, oily matters, mixed with carbonate of ammonia, pass over, leaving behind bone-black, or animal charcoal. (See Bonk-Black, Bonk-Luquok.) The following are the analyses of ox-bone by Berzelius, and of the human fore-arm by Hemtz :-

	Ux-Done.	Human tole-run
Animal matter	. 33:30	31 11
Phosphate of lime	. 55.45	59.14
Carbonate of lime		6.33
Phosphate of magnesia		1.20
Fluoride of calcium	2.90	2.23
Potash and soda salts	. 2.45	<u> </u>
	100:00	100:00

The great value of ground bones as manure depends upon the quantity of phosphate of lime contained in them: hence battle-fields are notably fertile. Ground bones are now generally prepared for manure by adding a certain portion of sulphuric acid to them, by which means a superphosphate of lime is formed, which is soluble and easily absorbed by the plants to which it is applied. (See ANATOMY.)—Ref. Carpenter's Principles of Physiology; Holden's Human Osteology; Quain's Anutomy.

BONE (in Manf.). - Bones, in a great variety of ways, They are give employment to manufacturing skill, used by turners and cutlers, but their oil must be previously extracted by boiling, and they are afterwards bleached in the sun or with chloride of lime. This, unfortunately, renders them more brittle and less easy to turn. The form and nature of most bones, with their large cavities for marrow, are also unfavourable to their being worked into common articles of domestic use, such as knife-hundles, brushes, &c. The buttock use, such as knite-handles, brushes, &c. The buttock and shin-bones of the ox and calf are the bones most generally used. Common bone articles, such as nail and tooth-brushes, are often polished with sized nime used wet on flauncl or woollen cloth. Bones are also used for making animal charcoal; and, when calcined, bone-ash. (See Bone-Ash.) The scrating with the statement of th pings, parings, and sawdust of bones, are much used in making gelatine for the confectioner, and also in case-hardening small objects in steel. In Manchester, bones are boiled in open pans for twenty-four hours, when the fat is skimmed from the surface and sold to soap and candle manufacturers. The size which is left is boiled down until it is of sufficient consistency for stiffening the goods for which it is intended. The pasture and grass lands, and the residual bones are readily bought up by the farmers. A very good liquid manure is also made by digesting burnt bones in weak sulphuric soid. This affords a direct solution, con-taining superphosphate and sulphate of lime, which is useful for grass lands or fields of rising corn. If pearluseful for grass lands or fields of rising corn. If pearlash is added to this acid solution, and the mixture dried

## Bone-Ash

rly 85,000 tons of bones, valued at £500,000. In the surry co,000 tome of rones, valued at 2500,000. In the surren steppes of Tartary and in the Pampas of South sacrica bones are used as fael; and in Norway and weden, in times of scarcity, fish-bones are browned a a gridiron till they are friable, and with ealt and super form palatable food. (See Ivorx.)—Ref. Ivons. The Society of Arts—"On Bone and its Uses," by leaver at the of mry Aitken.

Senty Aithen.

Bons-Ass, the mineral constituents of calcined bones, containing the whole of the earthy matter.

Bone-ash cousists principally of phosphate and carbonate of lime, with a small quantity of phosphate of magnesis and chloride of sodium. By dissolving bone-ash in hydrochloric acid, and precipitating by means of manorins, its most valuable component, phosphate of sime, is produced nearly pure. Bone-ash is largely used in the preparation of artificial manures, and in making cupels for assaying purposes.

BONE-BLACK.—When bones are subjected to destructive distillation, a black granular earthy mass is

structive distillation, a black granular earthy mass is left behind in the retort. This contains phosphate of lime, carbonate of lime, and charcoal, and is extremely rainable, from the property it possesses of decolourizing vegetable substances. It is therefore much used as a descolourizing agent in various processes, but more particularly in sugar-refining, for decolourizing the brown straining in augar-reining, for decomment of the symp. When used for chemical or pharmaceutical surposes, it is digested with hydrochloric acid until actining remains but nearly pure carbon. This promerts is due to its very firm state of division. The porty is due to its very firm state of division. The coarser varieties of bone-black are used in the manu-

facture of blacking. (See Charcoal.)

BORE-LIQUOR.—The liquor which distils over during the preparation of hone-black divides into two parts,one a mixture of various oils, and the other a solution of carbonate of ammonia, or bone-liquor, as it is called. It is much employed in the manufacture of the solution

and salts of ammonia.

BONFIER, bon'-fire (Fr. bon, good; Sax. fur, fire), a fire made for some public rejoicing, usually in some conspicuous place; as on the top of a hill, we some conspicuous part of a town, so as to be visible from a distance. The etymology of the term is very doubtful; some suppose it to have been so called from being generally made of bones; others consider it to mean a contribution fire, one to which every one in the neighbourhood contributed a certain portion of materials; others derive it from boon or bon, good, and fire. The practice of kindling bonfires in this country is one of great antiquity. (See BELTEIN.)

BOXNOMMES, bon'-om, an order of hermits of simple lives and manners, who made their appearance in France about 1257. The prior of the order was called France about 1257. The prior of the order was called by Louis VI. le bon homme, whence they derived their me. They made their appearance in England in 1283.

BONTTO, bon'-e-to (Sp.), a name applied to several thes belonging to the fam. Scomberidæ. There are three varieties,—the Thynnus pelamys, the Pelamys surda, or Belted Bonito, and the Auxis vulgaris, or Plain Bonito. Plain Bonito. The T. pelanys resembles the tunny, and is not unlike a large mackerel. In tropical climates it is found in large numbers, and is well known to sailors as one of the fishes constantly seen in pursuit of the flying-fish. It is a very pretty fish, of a rich fluse colour, with four dark lines stretching from the pectorals to the tail, on either side of the belly. Its average length is about two feet, and it is generally manche with an implation flying-fish as a bait. The The T. pelamys resembles the tunny, saught with an imitation flying-fish as a bait. The Black Sea. The plain bonito is also found in the Mediterranean, where its flesh is salted or pickled, and sed for food : but it is never eaten when fresh.

SORRER, bon'net (Fr. bonnet, cap), in Mil., the ele-stion of the parapet about the salient angle of a salion or ravelin above the general level of the work. The name is also given in permanent defensive works to a little outwork with two faces, forming a sulient gie, intended to protect the angle of a ravelin (see Rayking), the faces of which are defended by tenailess or lunettes. (See TENAILLON, LUNETE.) An ontwork of a similar kind, used in Beld fortification, having three salient angles instead of one, is called a

mest de prêtre, or priest's bonnet.

Bongsar, a covering for the head, of which there
is many varieties. It is applied to the head-dress

#### Book

In Scotland the "blue bonnet" of either sex. one time the national characteristic of the low land Scotch, and was famous both in song and story. It was manufactured of thick milled worklen, and was broad, round, and flat in appearance, with a small red tuft on the top. It is still worn to a considerable ex-

tent on the top. It is still worn to a considerable ex-tent by the peasantry of that country.

BONY PIKE, pike (Lepidasteus ossess), an elongated pike-like fish, inhabiting the warmer lakes of America.

The jaws of this fish are usually produced into a long narrow snout, presenting considerable resemblance to that of the Gangetic crocodile. The vertebral column presents a structure such as is met with in no other fishes, the bodies of the vertebræ being regularly arti-

culated together.

BONES, bonz-es (Japanese Busso), the name by which the priests of Buddha or Fo are usually designated in Japan. They form a very numerous class in that and are composed of all ranks of society. country, and are composed of all ranks of society. They are divided into various sects, and comprise both males and females. There are convents for the male as well as for the female bonzes, some maintained by voluntary contributions, others having their own fixed revenues. The principal moral precepts which they inculcate are five; namely, not to kill, not to steal, chastity, veracity, and abstinence from spirituous liquors. The term bonzes is also frequently applied by Europeans to the priests of Buddha in China, the Burance contributions of the state of the contributions of the state mese empire, and other parts of eastern Asia.

BOORY, boo'-be (Sula fusca), a name given to a large

bird, a species

of gannet. It is not quite so large as a solan goose, and it desolateislands and unfrequented coasts of most warm climates. has received ite name in consequence of apparent stupidity, sitting quietly and allowing itself to be knocked on the

TER BOORY.

head, or be taken away by any one attempting it. is very powerful on the wing, and feeds on fishes, which it watches while flying close to the surface of the water, and then catches by suddenly diving down upon them. Its colour is dark brown, rather white underneath. Its bill is much longer than its head, and its gullet is so expansible that it is able to swallow fishes of large size. The male and female resemble each other closely size. The mate and femate resemble each other causing in appearance, and the latter only lays one egg. The flesh of the booby, like that of all birds that live on fish, is not agreeable when cooked. (See Garner,) BOOK, book (Sax. bod) is a general name given to almost any kind of literary composition, but in a more limited sense to such as are large enough to form one or more volumes. When short conjunting only a few

or more volumes. When short, occupying only a few sheets, sewed or stitched together, it is called a pamphlet. Certain divisions of a literary work are also sometimes designated by this name; as the Books of Homer's Iliad, or of Virgil's Abucid. In ancient times books were commonly written upon prepared strips of the Egyptian plant papyrus. They were wound round small cylinders or rollers,—whence the Latin term tolamina, and our word volume. Plates of lead and copper, wood, the bark of trees, and even bricks and stone, have been employed as materials in the construction of books. Leather and parchiment were also used by the ancients, and when, by the capture of Egypt by the Arabs, in the 7th century, papyrus could no longer be obtained, the use of parchiment became general. During the Middle Ages the plan of rolls was discontinued, and the form of leaves sewedor bound together came into use. The manufacture of books was for the most part in the hands of the different orders of monks, many whom spent a great part of their lives in the transcrib-ing of them. In the earlier part of the Middle Ages the

#### Bookbinding

Book-keeping

scarcity of books was so great that often in a whole town there was not one to be found, and even rich monesteries possessed little more than a missal. The leadure of the monks, however, did much to improve this state of things; white the general introduction of paper about the 13th century, followed by the invention of printing, have been of incalculable benefit in the circulation of knowledge. Books may now be had for a few shillings, which would formerly have cost hundreds of pounds. (See Book Talle.)

HONERSTING (Ang. Sax.).—Books were formerly preserved in the form of rolls, consisting simply of the caree pasted or guide together in one long sheet, at each

leaves pasted or glued together in one long sheet, at each end of which was fixed a roller with handles. The roll was read by unwinding one roller and winding the other. This form of binding was afterwards superseded by the square form, as we now possess it. This was a marked improvement, and was adopted for manuscripts long before the invention of printing. The first bound books being chiefly copies of the Scriptures, and other works of a religious nature, they soon began to have their bindings enriched in various ways. Many of these ondings enriched in various ways. Many of these rich bindings exist to the present day. They were executed principally by jewellers, who incrusted pre-cious stones, ivory, and metal-work upon covers of volums, wood, or silver. The greatest taste has been shown in all ages in the matter of bookbinding; and shown in all ages in the matter of bookbinding; and
whether we examine the gorgeous but clumsy covers
of the 11th and 12th centuries, the splendidly-bound
books of the Renaissauce period, or the modern works
of Rogers, Leighton, Bedford, and a host of others,
there is always something to charm the fancy and gratify the taste. As a mere manufacture, bookbinding has been obliged to keep pace with the marvellous increase in the number of books produced; and, by means of machinery, such houses as Remnant's or Leighton's are able to bind 1,000 volumes, in cloth gilt, Legaton's are able to find 1,000 volumes, in citof git, in six hours! In binding a book, whether it be a tenguinea folio by Owen Jones, or a 2s. 6d. volume of the Boy's Magazine, the number of operations is three; viz. 1. Preparing, 2. Binding, 3. Finishing. The sheets as printed are first "gathered," that is, placed in their order of pagination, folded into four, eight, or twelve leaves, as the case may be; they are then stitched and sewn to strings or bands placed at the back of the volume. A saw-out is, in some instances, made to receive the string; in others the string is left to form a rib, which is used as an element of ornament in finishing the book. The sheets being all sewn together, the back edges are glued together by brushing them lightly with thin glue. The strings are cut off within hilf an inh of the volume and the hard is recorded. half an inch of the volume, and the back is rounded in the following manner:—The workman holds the volume flat, and beats it with a flat hammer, at the same time drawing the sheets so as to cause the rounding of the odges. A groove is then formed by pressure close against the back edge to receive the board of the cover, otherwise it would be liable to project beyond the edge of the volume, and be both unsightly and inconvenient. A machine for rounding the backs of books has been lately introduced. The top, bottom, and front edges are then cut level, and the boards are fixed to the volume by the ends of the strings being passed through small holes and glued firmly to the inside. When the book is cloth-bound, the cloth is applied to the boards before they are attached to the volume; in other cases the coverings are put on after the boards are attached. The rerings are put on after the boards are attached. The book is then ornamented with gilding, inlaying of differ-ent-coloured leather, or blind tooling, i. e. plain stamp-ing by heated stamps or dies, and the edges are left plain, or git, or sprinkled. Books are said to be "boarded" when bound in cloth, "half-bound" when the back and corners are in leather, and "whole-bound" when nothing but leather is used. It is generally considered that hearded books will be afterwards bound in leather nothing but leather is used. It is generally considered that boarded books will be afterwards bound in leather, according to the teste of the possessor; they are, therefore, mostly left uncut, and the putting together is more or less slight. A method of binding without without here has lately been much used the form addeen. is more or less slight. A method of binding without stitching has lately been much used: the four edges of the book are out, separating it into single leaves; India-rubber solution is then applied to the back edge, whereby the leaves become firmly cemented together. It is very useful when the book is required to be laid epsil flat, as in the case of atlases, ledgers, music-books, &c. The following is a list of the most common sizes

of books, with familiar examples to fix them as t of books, with familiar examples to fix them an memory:—Folio, the volume of 100 plates to Layse "Monuments of Nineveh;" quarto, the "Encyclopes Britannica," and "Beston's Family Bible;" out "Beston's Universal Dictionary" and the "Moown Magazine; "10mo, Peter Parley: A Tales: 18 Pinnock's Catechisms, and Knight's Weekiy Volume 24mo, Routledge's "American Poets;" 40mo, Picking, "Liberand Cleanies" no, Picker ing's " Dismond Classics.

BOOK-REEPING (Ang. Sax.) is the art of keeping accounts,—the art of recording in a regular, concise and accurate manner, the business transactions of merchants or others, in a set of books kept for the purpose. Of the early history of book-keeping little is known. In the 15th century the double-entry system was practised by the merchants of Venice and other towns of Ituly, then the great mercantile country of the world, whence it has obtained the name of the Italian method. In the early part of the 16th century it had been introduced into France; and the first the tise in England upon the subject was by Eugh Old-castle, a schoolmaster, and was published in 1543. Since that time more than 150 different works have been published in this country upon book-keeping. Books are kept either by single or by double entry. The system of single entry is the simplest method of keeping accounts; but it is only suitable for retail dealers, or such as carry on but a small business, being wholly inadequate to the recording of complex traactions. It receives its name from each item being entered only once in the ledger. The only books neces-sary for it are a journal, or day-book, and a ledger. In the former the merchant enters all his transactions as they occur in the course of business; in the latter be arranges them under their several accounts, carrying his sales to the debit of his customers, and his p chases to the credit of the merchants who supply t with goods. The system of double entry is so called from each item being entered twice in the ledger, being debited to one set of accounts and credited to anoth It proceeds upon the principle, that every business transaction is twofold,—that there can be no sale without a purchase, no payment without a receipt; and hence, by entering each transaction on both sides of the ledger, a system of checks is established, iene much as the entries on the credit side must be equal to the entries on the debit side, otherwise the books will not balance. Although book-keeping is a system beautiful and complete in itself, yet its details necesssarrly vary according to the nature and extent of the actions to be recorded. It is alike applicable to the accounts of merchants, manufacturers, or public com-panies; but the mode of carrying out the details will vary in each case. Its object is to secure a clear and condensed statement of every fact and transaction connected with the business, so that it may be at once understood, and that accuracy may be secured. less a merchant knows how his affairs stand, less a merchant knows how his affairs stand,—the amount of his income and expenditure, of his debts, and his liabilities,—it is evident that he must proceed upon vague and possibly erroneous conclusions, which may result in insolvency. The number of books required in double entry will depend upon the nature and extent of the business. In the case of merchants the books commonly used are the day-book, invoke-book, cash-book, bill-book, and ledger. In the day-book, cash-book, bill-book, and ledger. In the day-book and proceed a daily account of all the goods soid on credit, with the uniter with the nature of the numbers. with the prices and the names of the purchasers. invoice-book, called sometimes the credit day-book, conthins an account of all goods bought on credit, with the name of the seller and the amount. In the cash-book is kept an account of all the cash received and paid, and of the discount received and allowed. On the left-hand page is entered the cash received, and is an inner column the discounts allowed; and on the right-hand page the cash paid, and in an inner column the discounts received. At the close of business for the discounts received. At the close of business for the day, the amounts on both sides are summed up and bulanced. The bill-book gontains in one part as account of all the "bills receivable,"—i.e., bills of which he is to receive payment; and in another as account of all "bills payalle,"—i.e., those that have to be paid. It contains a statement of the dates, amounts, when due, and other particulars of the

several bills. All these books are very simple in their character, and are usually termed "sub-sidiary books," the *ledger* being the principal book in a business. It contains an abstract of the entries scattered through the various subsidiary books, all arranged methodically under the names of the different persons standing in the relation of debtors or creditors to the merchant. Two sets of columns are assigned to each account, one for Dr., the other for Cr. Besides these accounts, which are termed personal from being made out in the names of the persons with whom the merchant has dealings, there are what are termed real and fictitious accounts. Real accounts are made out to show the merchant where, how, and in what proportions his property is invested, under such heads at cash, merchandise, bills receivable, and the like. Rectitious accounts are such as are made out to show his gains and losses, under the heads, charges, profit and loss, balance, &c. The fundamental principle of double entry, that every item carried into the ledger must be entered twice, must be entered on the Dr. side of one account, and the Cr. of another, leads to the result that the aggregate amount of all the entries on the Dr. side must exactly balance those on the Cr. side of the ledger. The account giving out the item is always the ledger. Or., and the account receiving it always the Dr. copying of the items from the subsidiary books into the ledger is termed "posting." To facilitate the post-ing of the ledger, an intermediate book called the journal is sometimes used. Its object is to indicate to what accounts, and to which side of each account, the transactions recorded in the subsidiary books are to be carried. It is also found most useful in practice as a check against posting entries to the wrong accounts in the ledger. The balance-sheet is a condensed statement of the merchant's assets and liabilities, drawn up in order to show the state of his affairs. His assets are found in the balances on the Cr. side of the ledger accounts, and these are put on the Dr. side of the balances heet. His liabilities are the balances appearing on the Dr. side of his ledger accounts, and these are brought to the Cr. side of the balance-sheet. The difference between his assets and his liabilities is his present worth. A proper balance-sheet ought to show the manner in which the capital was invested, as money, stock, debts, &c.; also the expenses at which the business had been conducted, and the money drawn out on private account. "Let no man," says Dr. Johnson, venture into large business while he is ignorant of the method of regulating books; never let him imagine that any degree of natural abilities will enable him to supply this deficiency, or to preserve a multiplicity of affairs from inextricable confusion."

BOOK OF LIFE, OF THE LAMB'S BOOK OF LIFE, is one of those descriptive phrases of which there are so many in Scripture, by means of which a knowledge of divine things is communicated by referring them to objects or customs of daily life. It was the custom with princes to have a list of all the distinguished persons about their court, or in their service; and hence, when it is said that one's name is written in the book of life, it means that he particularly belongs to God, and is enrolled among his friends and servants. On the other hand, to have one's name blotted out of the book of life signifies erused from the list of God's friends and ser-

riginies erased from the list of God's friends and ser-rants, as those who were guilty of treachery were struck off the roll of officers belonging to a prince. BOOKELLERS' MARKS OF SIGNS.—Many of the early printers, or booksellers, in place of putting their name on the title-page of their books, adopted a certain mark or sign; and hence a knowledge of these marks is of use in distinguishing different editious of works. The anchor is the mark of kaphelengius at Leydon; the anchor with a dolphin twisted round it that of the anchor with a dolphin twisted round it, that of Manutii at Venice and Rome; the Arion, of Operinus at Basel; the cadnesus or Pegasus; of the Wecheliuses at Paris and Frankfort; the cranes, of Cramoisy; the compass, of Blantin at Antwerp; the fountain, of Vas-cosan at Paris; the sphere in a balance, or Janson and Biser at Amsterdam; the filly of the Juntus at Venice, Plorence, Lyons, and Rome; the mulberry-tree, of Merel at Paris; the olive-tree, of the Stophenses at Paris and Genoa, and the Elzevirs at Amsterdam and Leyden; the bird between two serpents, of the Fro-benius at Basil; the Truth, of the Cornelius at

Heidelberg and Paris; the Saturn, of Colinmus; the

printing-press, of Badius Ascensius.

Book Societies, or Book Churs, are associations for the purchase and circulation among themselves of new books as they issue from the press; after which they are usually disposed of by auction among the members, or sold to the public. Book societies are by no means so common as, from the many advantages of them, they might be expected to be. Book clubs, or reading societies," says Lord Brougham, in his "Pra-tical Observations on the Education of the People may be established by very small numbers of contributors, and require an inconsiderable fund. If the associates live near one another, arrangements may to associates live near one another, arrangements may be easily made for circulating the books so that they may be in use every moment that any one can spare from his work. Here, too, the rich have an opportunity presented to them of promoting instruction without constant interference; the gift of a few books as a because of the state of the st ginning will generally prove a sufficient encouragement to carry on the plan by weekly or mouthly contributions

BOOK-TRADE,-The business of dealing in books is of a comparatively recent date. In early times, when books were scarce and had all to be transcribed, those who copied them usually also disposed of them. In the later period of Roman history, however, there arose a class of persons termed bibliopole, who acted as a kind of middle-men, employing or purchasing books from the transcribers and disposing of them to the public. In the reign of Augustus, the brothers Socii were celebrated in this way. With the establish-ment of several universities in the 12th century, the trade in books was much increased, particularly in such towns as Paris and Bologna. In 1323, a statute of the University of Paris distinguishes between stationarii, or booksellers proper, those who buy from one party and sell or lend to another, and librarii, those who merely buy and sell books on commission. After 1342, no one could deal in books in Paris without the permission of the university, who had special officers to examine the manuscripts and fix the price. It was not, however, till after the invention of printing that the book-trade attained any importance. At Brst. the printers were likewise booksellers: and John Fust and Peter Schöffer disposed of the productions of their press in Paris and Frankfort-on-the-Main. Some instances of the division of the two branches occur in the 15th century. The first booksellers were usually termed stationers, either from the Latin word stationaries, or from having only stalls or stations in the streets and market-places of the towns, as is still to be seen in the case of dealers in old books. Now, the term stationer usually denotes a dealer in paper and other writing-materials. At first, the civil magistrates took little concern with the booksellers, leaving them to the control of the universities, of which they were supposed to be the immediate retainers, and which, accordingly, gave them laws and regulations, examining the correctness of their books and fixing the prices of them. This, however, was soon changed, and the trade of books calling was put under various restrictions. In 1550, the Stationers' Company of London was incorporated. It was composed of printers and booksellers, who ex-ercised a kind of censorship over the press. In 1862 the famous licensing act was passed, which prohibited the publication of any book unless extered in the rethe publication of any book unless critered in the re-gister of the Company of Stationers or licensed by the lord chancellor. (See STATIONERS' COMPANY and COPYRIGHT.) The book-trade is, properly epeaking, carried on by two distinct classes of persons,—the publishers, who prepare and dispose of the books wholesale; and the booksellers, by whom they are retailed to the public. According to the census of 1851, the number of persons engaged as booksellers and pub-lishers in England and Wales was 6,805, and in Scotlisters in England and water was 0,800, and in Scot-laud 1,489. The great centre of the book-trade in the United Kingdom is London, though a considerable number of works are also published in Edichurgh, Dublin, Oxford, Cambridge, Glasgow, and other provin-cial towns. Many provincial publishers, however, have branch establishments in London, and all of them have agents there, to whom they consign a certain number of copies of every work they publish, and to whom they also address their orders for copies of such books

## Book-Trade

as they may have occasion for. The hooksellers of Edinburgh and Dublin also act as agents for those of London, and supply the Scotch and Irish trade with the metropolitan publications. The London publishing trade centres chiefly in Paternoster Row (popularly known as "the Row") and the courts adjoining. "In 1860 there were connected with the book-trade, within the bounds of the metropolitan Post-office district, 211 booksellers who were also publishers, 568 book-211 hooksellers who were also publishers, 568 booksellers alone, besides 23 foreign booksellers and 12 law
booksellers; total, 812."—(Chambers.) Many of the
publishers and booksellers restrict their attention chiefly to certain classes of books; as theological, law, medical, general literature, &c. The average number of volumes of new works, exclusive of pamphlets, published annually in the United Kingdom exceeds 4,000; and of new editions, upwards of 1,200. In 1852, the booksellers of London formed a kind of trade-union, books only at the regular fixed price; but the attempted to compel retailers to sell books only at the regular fixed price; but the attempt entirely failed, and retailers may now sell books at any price they please. The deduction allowed by the pubprice they please. The deduction allowed by the publisher to the retailer is usually 25 per cent., or 3d. per shilling. It is also placed on a half-yearly or yearly account, from which, if settled by cash within a month after being rendered, a discount of 23 per cent. is al-lowed. Frequently, a work is, "subscribed" for among the trade; i. e. booksellers put down their names for a certain number of copies of a work before it is pub-lished, it being then offered at a somewhat lawer rete lished, it being then offered at a somewhat lower rate than is afterwards allowed. In order to get rid of re-mainders of books, trade-sales are often had recourse to, when they are either offered in small quantities at a very reduced price, or sold in the lump by auction.
Publishers wishing to dispose of a portion of their
stock sometimes issue to the trade sule-catalogues, in
which they offer certain books at a greatly reduced price. Trade dinners are not so frequent now as formerly though it is still the practice with some of the larger publishers to invite their acquaintances in the trade to a dinner at a tavern, when those present have an opa dinner at a tavern, when these presents are of copies portunity of subscribing for a certain number of copies. The of the books offered for sale at the stated price. terms of the agreement entered into between a publisher and an author are various, depending chiefly upon the character of the author and the nature of the book. Sometimes the publisher purchases the copyright for a fixed sum, and takes the whole responsibility of the sale upon bimself; sometimes the author retains the copyright, undertakes all risks, pays all expenses, and allows the publisher a certain commission on the sales; sometimes the publisher agrees to take all the risk of printing and publishing a certain number of copies, and to divide the profits with the author, who still retains the copyright of the work. Authors are apt to complain of the hard terms that are usually meted out to them by publishers, and in some cases, perhaps, not without reason. But it is to be borne in mind that there is always considerable outlay, and no little risk, connected with bringing out a new book, especially by an unknown author. The following is the especially by an unknown author. The following is the estimated cost of bringing out 750 copies of a work of 500 pages

Printing and corrections	£85
Paper	30
Boarding in cloth	24 30
Advertising	30

Were all the copies sold (after deducting those for presentation) at 7s. 6d. each (i. c. the trade price of 10s.), 25 counting as 2s, there would remain about £90 for interest on capital and publisher's and author's profit. But this is rarely the case, and frequently the sale does not meet the actual outlay for printing and apper. Not more than one book in eight ever reaches a second edition. There have been instances (we fear rare) of publishers handsomely increasing the stipulated remuneration, when the sale of a work largely exceeded their expectations. The Messrs. Blackwood, of Edinburgh, at first gave the Rev. J. Caird £100 for bis sermon "Religion in Common Life," but the sale of accessed their expectations, that they subsequently presented the author with £400 in addition; and the projector of the present work brought out an edition of

#### Book-Trade

"Uncle Tom's Cabin," which was so successful, that he voluntarily presented the authoress with £500, and subrequestly presented the authors when the book is has been calculated that 1,500,000 copies were sold in Eugland, 'Mr. Beeton's firm alone issuing 697,000.) The epoch of cheap literature may be said to have commenced, however, partially in 1827, when Constable issued his "Miscellany," and the Society for the Diffusion of Useful Knowledge their "Library of Useful Knowledge their "Library of Useful Knowledge "On the 4th of February, 1832, appeared Knowledge." On the 4th of February, 1832, appeared the first number of "Chambers's Edinburgh Journal," and, on the 31st of March following, "The Penny Magazine." Soon after was commenced "The Penny Cyclopædia" of the Society for the Diffusion of Useful Knowledge, a work not more remarkable for its cheapness than for the ability with which it was conducted. Forty thousand pounds was distributed amongst the authors and artists engaged in its production, of which sum more than three-fourths had been laboriously carned by the diligence of the writers. Cheap publications are now the order of the day. Not only are chesp editions brought out of works unprotected by copyright, but even publishers of the first class find it their interest to bring out cheap editions of popular books the copyright of which is secured to them. Among the names chiefly entitled to honourable mention in the field of cheap literature, we may, without detracting from the merits of others, give those of Charles Knight facile princeps, the Chambers' of Edinburgh, Bohn, and Routledge. It is now usual to stereotype cheap books and periodicals of which the sale is expected to be considerable, or to extend over a considerable time; and this course is adopted even with large books like the "Encylopædia Britannica." The old-book trade, or the sale of second-hand booke, is carried on to considerable extent in all the larger cities and towns of the United Kingdom; but London is its principal of the United Kingdom; but London is its principal seat. Many of these dealers prepare periodically price catalogues of their books, which they circulate through the country, and in this way dispose of a great many of their books. The price of old books is very fluctuating and capricious, depending in some measure upon this could be considered. their condition or intrinsic value; but frequently equally good copies of the same work may be had at a half or third of the price in some shops that they can be obthe book-trade is Leipsic, where two great book-fairs are held annually, at Easter and Michaelmas respectively. These fairs are not so important or so largely attended now as formerly, a great part of the business being effected by means of agents or commissioners. Every bookseller in Germany has his commissioner at Leipsic, to whom he transmits copies of all his new publications, and who distributes them among the other commissioners, for being transmitted to their employers. At the end of the year the unsold works are sent back by the same means to their several publishers. The great advantage of this system is that every new book is, within a few weeks of publication, made known throughout Germany without having recourse to the expensive and imperfect system of advertising. The accounts of the various booksellers are also usually settled by means of the commissioners. In France the booktrade is carried on much in the same way as in England, and centres in Paris. In the United States of America. the book-trade is carried on to a large extent, and on account of non-existence of international copyright, the books of this country are largely reprinted there. It is indeed asserted that while, in 1820, of the number of books published in the United States, 70 per cent. were reprints of British publications, in 1856 the proportion was only 20 per cent. But it is undeniable that the best books of this country are still reprinted with-out authority in the United States. From the low price out authority in the United States. From the low price at which reprints of popular English books can be produced, the sale is often four or five times greater than queed, the sale is often four or five times greater than in England. It is said that in five years there have been sold in the United States 80,000 vols. of the 8vo edition of "Modern British Essayists," 60,000 vols. of Macsularies, in 3 vols. 12mo; more than 50,000 of Murray's "Eucyclopædia of Geography," 10,000 of McCulloch's "Commercial Diotionary," more than 100,000 of "Jane Eyro." The sale of Thackersy's works in the States has been engaging that it England: and in the States has been quadruple that in England; and that of Dickens's works counts by millions of volumes.

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## Boom of a Harbour

"In 1853," according to Trübner's "Bibliographica Guide to American Literature" (1859), "there were 355 book-publishing establishments in the United States." At present the number is more than 400. About three-fourths of these are located in New York, Philadelphia, Baltimore, and Boston, the rest being principally in Cincinnati, Charleston, New Orleans, Buffalo, Auburn, Albary, Louisville, Chichago, St. Louis, and Hartford, There are more the 2000 hockession, who discount who discount There are more than 3,000 booksellers, who dispense the publications of these 400 publishers, besides 6,000 or 7,000 general dealers, who connect the trade in books with the ordinary stock of a country store." The book-trade of 1856 is estimated at 16,000,000 dollars. An interesting article on this subject, by Mr. W. Chambers will be found in "Chambers's Eucyclopædia." also "Bookselling," in Encyclopedia Britannica;
Books," in McCulloch's Commercial Dictionary;
Trübner's Guide to American Literatura; and Trubner's Guide to American Literatura; and the Modern Press, by Charles

Knight. BOOM OF A HARBOUR, boom (Du.), a term applied to a strong iron chain or cable fastened to a number of spars or poles, and drawn across the mouth of a harbour, for the purpose of preventing the entry of an enemy's ships of war. This chain or cable may be raised or lowered above or below the surface at pleasure, by means of capstans and other mechanical consults.

trivances. BOOMERANG, beom-s-rang', a missile instrument used by the aborigines of Australia, in war, sport, and the chase. It consists of a piece of hard wood of a bent form, with the curve of a parabola, is about 2 feet long, 24 inches broad, & inch thick, and is rounded at the extremities. One side is flat, the other convex, and it is brought to a bluntish edge. It is discharged by the hand by one end, the convex edge being forward and the flat side upward; and it is thrown as if to hit an object in advance; instead, however, of going forward, weapon among almost the lowest races of savages upon the earth, and was first made known in this country by Professor McCullagh, in 1937: since then it has been endeavoured to apply the principle of the boomering to the propulsion of ships.

Boon, boor (Du. boer; Gor. bauer), properly signi-

fles a countryman, or one who is employed in agri-cultural labour; and from that it has come to be used in a secondary sense, to denote a coarse, uneducated. clownish person.

"The boorish driver leaning o'er his team Vocil'rous and impatient of delay.

Boor, or Bordenin, boof, a mode of torture used in former times in this country, our more persons Scotland, in order to extort confession from persons accused of crimes. This instrument of torture, which acoused of crimes. This instrument of torture, which was applied to the leg, was of various kinds. Sometimes it was composed of parchiment applied moist, and then brought near the fire, so as by shrinking of the compositions o to cause great pain and uncasiness; sometimes it round either one or both legs with cords, and then tightened by means of wedger, until, occasionally, the bones of the unfortunate sufferer's legs were broken; This barbarous piece of torture-apparatus is also said to have been made of iron.

BOOT AND SHOR MANUFACTURE. - This useful manufacture, as now followed in London and other large towns, is divided into many branches. There is the shos-closer, who is generally a woman,—she prepares attaches the sole part to the upper-leather; the book conser, who prepares the leg and vamp portion of the boot; the bootman, who attaches the sole part to the sather, similarly to the shoeman; the jobber who is allocated the sole and the blocker, chicker, runer, cleaver-up, &c. Many

## Bootes

persons of both sexes are employed in the manufacture of boots and shoes in this country. Till 1846 it was an ordinary handicraft; but, since that time, the manu-facturers of Northampton and Stafford hase introduced sewing-machines, by means of which much of the former labour is dispensed with. These two towns have for many years been the principal sources from which the London market has been supplied; and their boots and shoes are considered to be equal to any of those made in Paris or London. Many of the so-called French boots are made by English manufac-turers with French fronts, which they import in large quantities from France; and there is also a considerble importation of French boots and shoes. In 1850 there were 165,466 pairs of boots, shoes, and goldsheimported, and 609,599 pairs of boot-fronts. The first processes in the manufacture of boots and shoes ar the cutting and sewing of the leather, which are merely mechanical. M. Lefebre, of Paris, has made an in provement in boot and shoe-making, which he has patented. By means of machinery the sole and hee are fastened to the welt by brass screws, which keer them in contact with a pressure equal to two or three hundredweight. A specimen of this machinery was shown at the Exhibition of 1851. Mansell's blocking apparatus is another of the many improvements intro-duced into this manufacture of late years. It effects the blocking of a boot in less time than the usual process, and does not injure the leather so much. A piece of leather cut into the proper shape for the front of a boot is soaked in water; the part which corresponds with the instep is then rubbed with an oily pasta called "dubling," and the whole is laid upon two iron cheeks By means of a winch and two cog-wheels, the leather is brought down between the cheeks by a plate of zinc and this process is repeated according to the strengt! of the leather. By a patent taken out by Waite, a London manufacturer, some years ago, the necessity until it resoftes a considerable height, when it begins to retrograde, and finally passes over the head of the projector and falls to the ground behind him. The projector and falls to the ground behind him. The boomerang, in one-tenth part of the time required in the bulged side of the instrument. The boomerang, the invention of which would have done henour to the most celebrated man of science, has long been a common to the bulged side of the instrument. ordinary plan. Waite has also patented a machine by which instep-pieces for women's and children's boots and shoes are modelled. By a process invented by Marsden, small holes, kept open by metallic plates, are inserted at the sides, for ventilating purposes. The use of india-rubber and gutta-percha in boot and shoe-making has produced very great changes. Gutta-percha, although not serviceable in hot climates, is very useful in withstanding moisture, when applied to the under-leather. There is also a process, patented by Hetley, in which india-rubber and gutta-percha, nixed with leather raspings, were pressed into blocks and sliced. This substance was then used as shoeleather. India-rubber is often applied to various parts of the boot or shee, in order to give lightness or elas-ticity. A pair of boots were made for a racing joolesy amost entirely of this material: they only weighed four ounces. Several terms are employed in order to distinguish the various boots made with india-rubber; such as resilient, siccopodean, and tei-ideicelasticon, &c American over-shoes, or goloshes, made of vulcanized india-rubber, are much worn, in order to protect boots or shoes in wet or cold weather. The boots worn by soldiers were formerly produced with great rapidity, by a process invented by Sir M. I. Brunel: this process, however, fell into disusc. The defective way in which they were made added greatly to the suffering of the British troops in the Crimea. They are now made with an elastic piece between the heel and the sole, which causes the shoe to accommodate itself to the bending of the foot while walking. Many unauccessful attempts have been made by workmen and trades unions to prevent the introduction of sewing-marinines into this manufacture; but they are gradusily coming more and more into use.

sily coming more and more into use.

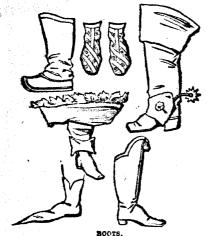
Bootus, bo-o-tee (Gr. boss, an ox), a constellation in
the northern hemisphere, called Arctophylax by the
old Greek astronomers. It is represented on the
celestial globe by the figure of a men holding a club is
his right hand and a string in his left, which holds two
hounds. Arcturus, a brilliant star of the first magnitude, is found in this constellation.

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BOOTH, booth (Fr. boutique), denotes a tent or stall in a fair or market for the sale of goods. The term is also applied to any temporary structure of wood or boughs designed for shade and shelter. In early times throughout Europe, trade was principally carried on at fairs by means of booths:—

Booths adden hide the Thames, long streets appear And numerous games proclaim the crowded fair."

Boots, shoes, and other coverings and protections for the feet, have been made of different substances, and in different forms, from very remote times. ancient Greeks and Romans, however, did not use them universally. The heroes of Homer are represented as going to battle without shoes, and Cato and Socrates both went about with bare feet. The boots and show which were then worn may be divided into two classes,— The heroes of Homer are represented as those in which the sole only was attached to the sole of the foot by strays, or coverings of the toe or instep, and those which ascended until they covered the ankle, the call, or the whole of the leg. The former correspond call, or the whole of the leg. The former correspond to the sandals and slippers of the present day, and the latter to the boots and shoes. The form and colour of these boots and shoes indicated the rank and office of the wearer. Before the invasion of the Romans, the ancient Britons were shoes made of raw cowhide, with the hair turned outwards. They reached as far as the ankles. The Roman influence soon produced a change



in the costumes of the British. Among the early Sexons shoes were made upon the Roman model, and boots reaching to the middle of the lcg, and laced up in front, were also in common use. They were generally of leather. The sandal also began to be used; but it was not suited to this climate: it was principally worn by the clergy. The boots of the later Saxons were very simiclergy. The boots of the later Saxons were very similar to the half-boots of modern times. Boots with wooden soles were much worn by men of high rank at that period. The boots of Bernard, king of Italy, the grandson of Charlemagne, had "the soles of wood and the upper parts of red leather, laced with thongs." The Normans were boots similar to the Saxons. During the reigns of William II., Henry I., and Stephen, the toes of boots and shoes were lengthened to an extravagant extent. The illustration in the left-hand lower corner represents a boot of that period. From that time until the reign of Edward III., the boots generally worn by the higher classes were ornamented profusely. During the reign of Richard II., the length of the toes increased still more, so that it is even said that the wearers were in the habit of fastening the tips to their knees, insorder to allow them to unar period. The boots of Bernard, king of Italy, the grandson of Charlemagne, had "the soles of wood and the upper parts of red leather, lackd with thongs." The Normans were hoots similar to the Saxons. During the reigns of William II., Henry I., and Stephen, the tores of boots and shoes were lengthened to an extravagant extent. The illustration in the left-land lower corner represents a boot of that period. From that time until the reign of Edward III., the boots generally worn by the higher classes were ornamented profusely. During the reign of Richard II., the boots generally worn by the higher classes were ornamented profusely. During the reign of Richard III., the boots generally worn by the higher classes were ornamented profusely. During the reign of Richard III., the boots generally worn by the higher classes were ornamented profusely. During the reign of Richard III. the boots generally worn by the higher classes were ornamented profusely. During the beit of fastentiation of the control of the tooty to the state of the looty to the same, the other third to God, to Mahomet and his descendants, and to oryonans, pilgrims, and the poor. In the Raglish army of the green said that the went, were worn, and half-boots, with the reign of Edward VI., long boots, soming up to the knee, were worn, and half-boots, with the provent day, the victor's share is generally termed prize. According to the regulations concerning prize-

this reign, the long toes were banished attagether, short broad-toed boots took their place. These has covered the feet, and were made of kid leather, sine in order to show the coloured hose beneath. Henry VIII. and Elizabeth's reigns shacked shoes, others or namented with receives or gold and lace, were worn. This fashion obtained till the t Cromwell. Russet boots, coming close to the Russet boots, coming close to the with large stiff tops, then came into fashion. A fished leather protected the instep; and they were brigad toed and had thick, clumsy heels. Large, cumbrous boots were worn both by the royalists and roundheads. The courtiers of Louis XIV. wore very extravagant boots, with very wide tops, which were decorated with a profusion of costly lace. The dandies in Charles II.'s reign adopted boots of this kind, one of wtwise represented in the annexed illustration. Turing the reign of William III. shoes with high heels, broad toes, and large ties, were worn. Small buckles also came into fachion at the same time. The stiff jackboot, also represented in the engraving, was also intro-duced at this time. They were high in the heel, and the instep was covered with a large prece of leather, to which the heavy spur was fixed. They were only worn the instep was covered with a large prece of issuer, so which the heavy spur was fixed. They were only worn when riding, and all cavalry soldiers were furnished with them. The jack-boot may be considered the origin of the top-boot and all the other varieties of long boots now worn. Boots with yellow tops were much worn in the 18th century in England; and the duke of Orleans and other revolutionists, who affected aromaths with the English wore tom-books. the duke of Orleans and other revolutionies, war-affected sympathy with the English, wore top-boots ostentatiously. They are now only seldom work, except by hunters and jockeys. The Hessian boot superseded the top-boot; it was worn with tight pan-tuleons and was a very handsome leg-covering. The taloons, and was a very handsome leg-covering. The Hessian boot, which had a tassel in front, is represented in the illustration; as is also the Chinese boot, one of the strangest forms of foot-covering ever adopted. The soles are composed of many layers of thin flannel

The soles are composed of many layers of thin finned compressed together. The upper portions are made of a pliable but waterproof fabric.

BOOTY, boo'ts (Swed byte; Dan bytte), the specific taken from an enemy in war. The Greeks divided their booty among the army in common, reserving to the general only a larger shere. One of the prerogatives of a Grecian general was the distribution of the plunder taken from a vanquished enemy. We read in Momer that the valuable armour usually fell to the share of the leaders, whilst the common soldiers were resmitted. the leaders, whilst the common soldiery were permitted the teaders, whist the common soldiery were permitted to gather the spoils of the dead. Among the Lacedemoniaus, however, the soldiery were forbidden to plunder the conquered, although, in certain instances, a portion of the spoils was dedicated to the godr, whilst some other parts were reserved for the highest communders. After the battle of Plates, which took place 800 years subsequently to the Trojan war, the spoils of the Persians were regulated by the generals, who, after setting apart a portion for the decoration of the temples, shared the remainder amongst the soldiery. From that time the plunder was sold, the proceeds being applied to the decoration of the temples, as the additions and to the generals and their friends. to the soldiers, and to the generals and their friends. By the military discipline of the Romans, spoils taken from the enemy belonged to the republic, particular persons having no right to them. The generals, who piqued themselves on their probity, carried it intact to the public treasury. Sometimes, indeed, they divided it among the soldiery, to animate them, and to serve in lieu of reward; but this distribution depended

distribution issued in 1831, two prise-agents are nominated by letters of attorney, one of these agents being selected by the field officers, and the other by the sub-ordinate officers. The agents collect the booty, and, having converted it into money, they pay over the proceeds to the authorities. The persons who are entitled to share in this preparate are named by the contribution. titled to share in this property are named by the com-mander who has directed the expedition in which it was acquired. See further upon this subject, PRIZE.

BORACIO ACID, bo-rds'-sk (from Arish, bource, a species of mitre), (BO<sub>4</sub>),—This acid, which may be regarded as a teroxide of boron (see Bokon), is the only known-compound of oxygen and boron. It occurs is nature in certain volcanic districts, where it is a matter in certain volcanic districts, where it is many the acid, in internity of the desired the careful in internity of the stem. Succession from the earth in jets mixed with steam. In Tusoany, these jets, or funerolles as they are called, are conducted into artificial basins or small ponds. we conducted into artificial basins or small ponds. The boracic soid remains dissolved in the water, which is periodically removed, and evaporated in shallow leaden pans, which are heated by other fumerolles in the neighbourhood. During the evaporation, great quantities of sulphate of lime are deposited, which require removal from time to time. About 760 tone of crude boracic acid are annually exported from Tuscany. The crude acid is contaminated with 25 per cent. of sulphate of ammonia and alumina, and other saline impurities. Boracic acid is used principally for making borax, or biborate of sods. (See Borax.) Boracic acid is formed in the laboratory by dissolving purified borax in four parts of boiling water, and adding to the borax in four parts of boiling water, and adding to the hot solution a quantity of sulphuric acid, equal to onefourth the borax used. On cooling, boracic acid crysfourth the borax used. On cooling, boracic soid crystallizes out in pearly scales, containing three equivalents of water. These crystals contain a small quantity of sulphuric scid, from which they are freed by washing, drying, and fusing them in a platinum crucible. On redissolving the fused scid in four parts of water, and recrystallizing, it is obtained perfectly pure. Boracic seid, on being strongly heated, becomes anhydrous; and at a red heat it fuses into a transparent glass, which remains clear as it cools. It soon crumbles to pieces by absorbing water from the air. Boracio acid communicates to its compounds the property of fusibility; hence the use of many borates, more especially the biborate of soda, as fluxes. It dissolves in three times its weight of boiling water, but is very insoluble in cold. The solution is remarkable for possessing the properties of an alkali when tested with turmericpaper, which it changes to a deep brown. Even to litmus it only gives a slight reddish-purple tinge. When a solution of boracic acid is evaporated, a certain quantity of the soid rises with the steam; and this is the cause of the fumerolles described above as as the cause of the fumeroties described above as existing in Tuscany. Anhydrous boracic acid is but slowly volatilized by heat. It enters into combination with alkaline bases in several proportions, resembling silicia acid in this as well as in other particulars. A sexborate and triborate of potash have been obtained; and, although one contains six equivalents of acid and the other three, they possess the property of restoring the colour of reddened litmus like an alkali Boracic acid dissolves in alcohol, and burns with a characteristic green flame, with the exception of biborate of soda. The borates are not very important salts, and need not be alluded to here, further than to mention that, as a rule, alkaline borates are freely soluble, while those of the other bases are either inactually or very sparingly so. In 1867 the following quantity of borace acid was imported:—from Italy, 19,510 cwt.;—the computed value of which was £50,000.

Boractrs, bor-a-site, in Min., an anhydrous borate of magnesia, found at Luneberg, in Lower Saxony, and one or two other localities in that neighbourhood. to course in cubical crystals, and, when heated, pos-senses electric properties, the opposite angles of the cube being found to develop opposite forms of elec-

BORAGINACER, bo-raj'-i-nai'-se-e (froms borago, the name of the gen.), in Bot., the Borage fam., a nat. and. of dicotyledonous plants in the sub-class Corollifore, characterized by an overy deeply divided that four lobes, from the middle of which a single prises. The species are herbs or shrubs, with the leaves, usually rough with hairs. The flowers are regular and symmetrical; the calyx is persis-tent, and divided into either four or five segments; the corolla has the same number of lobes, and metally scales in the throat; the stamens vise from the corolls, are equal in number to its lobes, and alternate with them. The fruit consists of two or four distinct achania placed at the bottom of the persistent calyx. There are 54 genera, which include nearly 700 species, chiefly natives of the temperate regions in the northern bemisphere. Among them we find many well-known plants; such as the Forget-me-not, Borage, Comfresand Alkanet. (See Myosoris, Borago, Symputyme, Anchusa.) The various species are remarkable for ANCHUSA.) The various species are remarkable for their mucilaginous properties; some have roots which

are valuable dyeing agents.

BORAGO, bo-ra'-go (bor, for Lat. cor, the heart, ago, I cheer; because it was believed to exhibarate the heart, in Bot., a gen. of plants forming the type of the nat. ord. Boraginacea. The species B. offcinalis, commonly known as Borage, is now naturalized in England and most of the countries of Europe. but was at a remote period confined to Asia Minor. It is characterized by a wheel-shaped corolla with a It is characterized by a wheel-shaped corolla with a very short tube, the mouth of which is closed by scales; by five stamens with forked filaments, the inner arms of which support the anthers; and by these anthers being connivent around the atyle, in the form of a cone. The entire plant is rough with hairs, and has rather a coarse appearance; but its flowers are very beautiful, being of a fine blue colour. The round leaves were formerly always added to The young leaves were formerly always added to a cool tankard, or draught made of wine or cider, with water, lemon, and sugar. The flowers are used on the continent to ornament salads, and the tender tops are sometimes boiled in soups.

BORASSUS, bo-ras'-sus (Gr. borassos, the skin of the date), in Bot., a gen. of Palms, consisting of but one species, which is found in every part of India. This has been named B. flabelliformis, and is com-monly known to the European inhabitants as the Its stem attains a height of from 25 to Palmyra. 40 fect, and bears upon its summit a magnificent coronal of fan-shaped leaves. The fruit is about the coronal of fan-shaped leaves. The fruit is about the size of a child's head, and, when very young, contains a sweet pulp, which may be eaten. From the juice obtained from this plant, large quantities of an intoxicating drink are prepared by the natives. (See TODDY.) The fibres of the leaves are used for cord-Toppy.) The fibres of the leaves are used age, and the outer wood of the stem for bows.

Bonax, bor'-ax (Arab. haurac, a species of hitre), a compound containing boracie acid (which see) and soda. It was formerly imported from the East in soda. It was former, imported from the Lase to the crude state, under the name of timeal, which contained borar in combination with various substances of a saponaceous nature. It was purified by being heated with lime or soda until the whole of the sospy matter and other impurities were separated. Borax is now mostly prepared by fusing two parts of boracic acid, obtained from the Tuscan lagoous (ness Researc Acid), with one part of soda-ash. The BGRACIC ACID), with one part of suda-ash. The mixture is thrown on the floor of a reverberatory furnace, and heated until all effervescence has ceased. The fused mass is lixiviated and boiled until the impurities are precipitated : it is then decanted, and set aside to crystallize slowly. It crystallizes in rectangular hexagonal prisms, containing 10 equivalents of water. A new source of borax has lately been discovered in a deposit of borate of lime, occurring in the interior of Peru. Great pains are taken to crystallize the solution in regular crystals of a large size, as such only are marketable. Bofax is of great use in the aris as a flux. Having the property, when molted, of dissolving me-tallic oxides, it is used in soldering to clean away the film of oxide that would otherwise prevent the metals from uniting. It is sprinkled on the metallic surface, and melts with the solder. It is also used in gold and silver refining, and in making enamel, to render the compound more fusible. It is extensively employed in the manufacture of certain kinds of glass, and for fixing colours on porcelain and stoneware. To the chemist it is very valuable in blowpips analysis. (See Blowpips.) Borax may be made to crystallize in octahedral crystals, containing only 5 equivalents of water, by carefully evaporating a solution, of specific gravity 1 256, at a temperature between 133° Fah. and

## Borborians

174° Fah. Octahedral borax is preferred for soldering purposes, as, from containing less water, it does not intenseece so much as the ordinary prismatic form.

Bornonians, or Bornonians, bor-bo-ries, a sect of Gnostics, who arose in the 2nd century, and led very licentious lives, denying the doctrine of the last judament.

BORDARII, bor-dair'-i-i, a class of agricultural occupiers of land in this country, frequently mentioned in Domesday Book. They were distinct from the servi and villani, and seem to have been in a less servile condition, having abord, or cottage, with a small parcel of land, allowed to them, upon condition of their supplying the lord with poultry, eggs, or other small provisions for his board. They seem to have been a provisions for his board. They seem to have been a kind of cottagers, many of them being bound to render service to their lord in cutting wood, drawing water, threshing, and such-like; and, indeed, the term is often used to denote menial servants employed in such offices on an estate. According to Spelman, they were inferior to the villani, who were employed in the tillage of lands. Their condition probably differed on different manors. The number of bordarii in the different English counties noticed in Domesday Book is 62,634.— Ref. Ellis's General Introduction to Domesday Book.

Ref. Ellis's General Introduction to Domestay Book.

BORDER, THE, bor'-der (Ang.-Nor., the outer edge), in the earlier histories of England and Scotland, is applied to a large tract of debatable territory which lay between the two countries, the inhabitants of which were almost constantly at war with each other. Many a daring feat and many an heroic deed of these men have been celebrated in song and story, and furnished materials for numerous tales of fiction. There is a strange mixture of courage, bonour, and generosity, in the accounts transmitted to us of these border-flights. According to Froissart, Englishmen on the one party, and Scotsmen on the other party, are good men of war; for when they meet, there is a hard tight, without sparing; there is no hoo (i.e. cessation for parley) between them, as long as lay on each upon other, and when they be well beaten, and that the one party hath obtained the victory, they then glorify so in their deeds of arms, and are so joyful, that such as be taken they s all be ransomed ere they go out of the field; so that each of them is so content with other, that, at their departing, courteously they will say, 'God thank you.' But in fighting one with another there is no play nor sparing." The females also caught the warlike spirit of the times, and appear often to have mingled in lettle. In order to repress in some measure the turbul-nee of the people, as well as to maintain some show of regal authority over them, the guardianship of the border of each country was wardens of the norder of the reductive warden; intrusted to certain officers of bigh rank, entitled Wardens of the Morches. There were three marches in each country,—the East, West, and Middle; and generally each march had a distinct warden; but occasionally two of them were united under one. duties committed to the wardens were of a twofold character,-the maintenance of law and good order among the people under their juri-diction, and the protecting them from their enemies on the opposite border. Unfortunately the trust was usually confided to some person of great weight and influence within the jurisdiction, and they were too often private en-couragers of those disorders which it was their duty to suppress. During the reigns of Elizabeth and James VI., streamous efforts were made to repress the warlike spirit of the borderers; and after the union of the two crowns, peace was in some measure established. The most intractable of them were formed into a body of troops, and conducted by Bucclench to the Belgie wars. The border counties were disarmed, excepting such weapons as were retained by gentlemen of rank and repute; and the moss troopers, who continued to exercise their forner profession, experienced in great numbers the unsparing and severe justice of the end of Dunbar. In the civil wars of Charles L, the bor-derers resumed their licentious habits, particularly after the war had been transferred to Scotland; and the exploits of the moss-trooper shourish in the diaries and military reports of the time. In the reign of Charles II., we learn that they still existed, from the statutes that were directed against them; and it was

## Boro Buddor

only by the strict administration of justice which ful-lowed the legislative union of the two countries in 1707, that the marauding tendencies of the people were entirely represend.—Ref. Essay on Border Antiquities, by Sir Walter Soot.

BORDER-WAREANT, in the law of Scotland, is a war-

rant issued by the sheriff of a county, or the magistrate of a royal burgh on the borders, for the apprehension of a person who has incurred debt in Scottand, but who is resident in England. It is granted on onth being made to the debt; but in practice these warrants. are now little used.

BORDURE, bor'-dure (Fr. bord, the edge, coast), in Her., a narrow space, running round the edge of the shield, and properly containing the fifth part of the whole field. It was originally used as a mark or our-ference, to distinguish different branches of the same varied, according to the different forms of lines of

division and boundary used in heraldry.

Bone, bor (Aug. Sux.), in Mil., the cylindrical cavity of any weapon used for the projection of shells, shot, bullets, or any missiles of a similar nature. The fowling-piece and the soldier's old weapon, "Brown Bess," are termed smooth bores, in contradistinction to fire-arms with rifled or grooved barrels. Formerly, the bore of cannon and guns of every description was cylindrical; but in the Lancaster gun an oval form is adopted, and in the Whitworth gun the bore is polygonal. In the Entield rifle and Armstrong gun there are a number of grooves twisting spirally along the interior surface of the barrel. The operation of boring cannon and gun barrels is one requiring great care and nicety, and is effected by the rapid revolution of a steel tool called a cutter, attached to a shaft which is turned by machinery; sometimes the gun itself is made to revolve while the boring-tool remains stationary. In guns that are cast hollow, or made of metal rods welded together on a core like the Armstrong gun, boring is necessary to bring the whole length of the interior to a uniform calibre. From 1750 until of late years, cannon were cast in a solid mass, and the interior cavity bored afterwards. The word bore is sometimes used in a similar sense to "calibre," to denote the diameter of the in-

BORER, bor'-er, a name given to many very small electricous insects of the genus Phinus. Their name colcopterous insects of the genus Ptimus. is derived from the fact that their larvæ, small white muggots, cat their way into old wood, &c., by means of strong cutting jaws, called maxilla. These holes, which they are constantly making in old furniture, have all the appearance of having been produced by a fine gimlet or drill. After working its way into the wood, the borer fills up the drill-hole in its passage with a fine powder, and forms a cocoon, from which it afterwards emerges in the form of a small winged beetle. The Anobiam tesselatum, one of the same genus, is re-markable for a loud ticking noise which it makes at night, and which has gained for it the title of the Death-watch. The Anohum striatum is also remarkable for the persistent way in which it simulates death.

BORING, bor'-ing, the act of perforating or making a hole throughout the entire length or thickness of a solid body. It is a term most usually employed to designate the processes used in sinking artesian wells (which sec), in seeking for minerals, and in perforating wood in carpentry, as well as metal, in the manufac-ture of guns and tubes. The application of the process, in so far as it relates to the boring of cannon and of cylinders for the steam-engine, will be treated of elsewhere. (See CANNON, CYLINDER.)

BORING THE TONGUE, like nailing the ear, pinching the nose, branding the cheek or forehead, was a species of punishment anciently inflicted in Scotland criminals, but which has now long ceased. The last of the kind on record is that of Jean Spance, a notour (i.e. notorious) thief, who was sentenced in 1728 to be pilloried, her lug (i.e. car) mailed, and her nose pinched.

Boro Buddon, bus-o bust-dos, a temple in Java, of
most claborate construction, decicated to Buddha
(see Buddunism), remarkable the hoing the finest speccimen of Buddhist prehitecture that is known. building is supposed to have been erected in the 14th century. It is pyramidal in form, rising from a square base, the sides of which are 400 feet in length. The

#### Boroffworie Acid

façade of the base is ornamented with a continuous bas-relief, in which various occurrences in the life of Siddhartha, the founder of Buddhism, are represented. The base itself is about 16 feet in height, and forms a terrace from 40 to 50 feet in width, to which access is obtained by flights of steps. On this platform five successive terraces, varying from 8 to 12 feet in height, and from 16 to 20 feet in breadth, rise one above another. On the edges of these terraces a great number of pinnacles and cupolas are built, the larger cupolas forming as many as 436 arched niches, in each of which a statue of Buddha, of life size, is placed. The spaces between the hiches are filled up with bas-reliefs of the same nature as those which surround the base. The ornamentation of the inner sides of these rows of buildings is more diversified, and of greater minuteness in detail, than that on the outside. On the fifth ter-race, which is square, corresponding in form to the base, three more, circular in form, are built, on which are placed at intervals 72 small domes, each containing a statue of Buddha. On the top of this huge terraced pile there is a dome, about 40 feet in diameter, sur-mounted with a spire; and immediately beneath it a sort of pit, or sunken chamber, 10 feet in depth, which is supposed to have contained some relic of Buddha.—

Ref. Fergusson's Handbook of Architecture.

Borofluoric Acin, bor-o-flu-or'-ik, or Fluoboric Acid, as it is generally called, is formed in combination with potassium by saturating hydrofluoric with borncie acid, and neutralizing by carbonute of potush. The compound is washed, dried, and heated with an equal weight of potassium. Borofluoride of potassium is

used in the preparation of boron.

BOROTHME'S HARP, bo-ro-cem'. - This ancient musical instrument formerly belonged to the great Irish monarch Brish Borothme, who met his death at the battle of Ciontari, A.D. 1014, when it descended to his son and successor Donah. The latter prince being deposed soon after by his nephew (whose father he had assassinated), fled to Rome, taking with him his harp and crown. These relies were kept in the Vatican until and crown. who soon after presented it to the first earl of Clanri-carde, in whose family it remained until the beginning of the 18th century, when it passed through a female branch of the De Burgha to the MacMahous of Glenagh, and thence into the possession of Counsellor Macna-mars of Limerick. In the year 1782 it was presented mars of Limerick. In the year 1782 it was presented to the Rt. Hon. William Conyngham, by whom it was deposited in Trinity College Museum, where it still remains. This curions instrument is about thirty inches in height, and richly ornamented, the sounding-board being of oak, and the arms of red sally. It contains a large crystal set in silver, under which was formerly

another stone, which is now lost.

Boron, bor'-on, in Chem. (symbol B, equivalent 10'9), a combustible element, closely allied in its properties to carbon and silicon (both of which see). In nature it occurs in combination with oxygen, in the form of boracic acid, in a few localities. It was first obtained by Davy in 1808, by submitting moistened boracic acid, inclosed between platinum plates, to the action of the voltaic current. A brownish substance appeared at the negative pole, which, conceiving to be a metal, he termed boracium. By further experiment he proved it to be a non-metallic body, resembling carbon in its properties, and altered its name to borm It was, however, but imperfectly known until Thenard and Gay-Lussac obtained it more readily by heating boracic acid with potassium. The metal combined with the oxygen of the acid to form potash, which was washed away with water, leaving the boron behind. A still more ready method of preparing it is by heating mixture of potassium and borofluoride of potassium in an iron crucible. Boron and fluoride of potassium with a weak solution of chloride of ammonium. Beron thus prepared is a brownish-green powder, dissolving slightly in water, forming a yellowish-green solution. It is rendered insoluble by being heated in close vesseis; its specific gravity being at the same time shinged from 1-183 to 1-844. It suffers no change, constructions of the construction of the construction of the method of the construction of the constructi

# Borough-English

electricity. Alkalies and acids (except nitric sold) produce no effect on it. Nitric acid converts it into boracic acid. It does not decompose water at any temperature, and is constant under the action of air or oxygen until the temperature reaches 600°, when it or oxygen until the temperature reaches 600°, when it burns belliantly, forming boracic acid by the absorption of oxygen. Prepared in the above way, boron is amorphous; but. MM. Deville and Wöhler have obtained it in garnet-red transparent crystals, by fusing boracic acid with 80 per cent. of metallic aluminium in a propagation former. a powerful furnace. The crystals are extremely hard, scratching sapphire and corundum, and yielding only to the diamond, which is generally injured by the operation. Crystallized boron has never been fused, and resists the action of oxygen at very high tempera-tures. Boron is obtained in a graphitic form when borofluoride of potassium is decomposed by aluminium. It bears a close relation to the graphitic form of car bon, or ordinary graphite. Boron combines with several elements, forming borides with the metals. The close relation always supposed to exist between boron and carbon has been curiously confirmed by the fact of both of these elements being capable of assuming the amorphous, crystaline, and graphitic forms. The only important compound of boron is boracio acid

BORDUGH, bur'-o (Fr. bourg; Lat. burgus; Sar. borhor).—A borough is a city or other town that sends burgesses to parliament. (1 Bl. Com. 114; Litt. 8, 164; Co. Litt. 108 b; see also Roform Act, 2 Will. IV. o. 45, s. 79.) The word, however, was originally used in a more extensive sense. (See Co. Litt. by Harg. 108 b, n. (4).) In Jacob's Law Dictionary, v. Borough, the term is taken to mean a town sending burgesses to parliament, and not being a city. But see the anthorities first cited; also Co. Litt. 109 a. In the Municipal Corporation Act, 5 & 6 Will. IV. c. 76, "horough" is used in a sense peculiar to that statute, and expresses a corporate town, whether sending representatives to parliament or not. Among our Saxon and Norman ancestors, all places which were colled horoughs were fonced or fortified. In the reign of Henry II, they had great privileges. If a bondman or servant remained in a borough a year and a day, he was by that residence made a free man - (Glance.) Why these were called free burghs, and the tradesmen in them. free burgesses, was from a free-lom to buy and sell, without disturbance, exempt from toll, &c., gramed by charter. Parliament boroaghs were generally by charter, or towns holden of the king in ancient demesne.—(Brady.) Erglish boroughs first sent representatives to parlyament in the reign of Henry 111., 1265. Burgesses were first admitted into the Scottish parliament by Robert Bruce, in 1326, and into the Irish in 1365.—For an account of the rise and progress of boroughs and other numicipal jurisdictions in Europe, consult "A View of the Progress of Society in Europe." in the Introduction to Robertson's Charles the Pfil. and The History of Civilization in Europe, by Guirot.

Borough was the name also given to a certain division of land under the Saxon kings. A borough or tithing comprised a district containing ten beads of timilie and ten tithings constituted a bundred. The head man of the borough was called the borough-head, headborough, borsholder, or tithing-man, and was answerable for the conduct of people of his borough. The ten householders of the horough formed a corporation, of which the headborough was president; and no man was allowed to reside above torty days in England without being enrolled in some boyough. (See TITHING.)

Borovgs, in Scotland. (See Pungal)

BOROUGH-ENGLISH (Sax. backer Englise) is a customary descent of lands (formerly held in uncient burgage) to the youngest son, or, if the owner harh no issue, to his younger brother, and extends to col-laterals in some instances. The custom prevails in several cities and ancient boroughs, and districts of smaller or larger extent adjoining to them, in different parts of the kingdom, and governs the descent of copyhold land in various manors. It is called horough-English in contradistinction, as it were, to the Norman customs, and which is taken notice of by Glanvil. lib. 7, c. 3, and by Littleton, s. 165. The reason given the thattery. Like silicon, it is a non-conductor of by Littleton is, because the younger son, by reason of

## Borough Fund

his tender age, is not so capable as the rest of his bre-thren to help himself. Other authors (3 Med. Rep. pref.) have, indeed, given a much stranger reason for this custom, as if the lord of the fee had anciently the right of concubinage with his tenant's wife on her wedding night; and that therefore the tenement descended notto the eldest but to the youngest son, who was more certainly the offspring of the tenant. Bus it is not known that ever this custom prevailed in England, though it certainly did in Scotland (under the name of mercheta or mercheta) till abolished by Malcolm III.; and perhaps a more rational account than either may fetched (though at a sufficient distance) from the practice of the Tartars; amongst whom, according to Father Duhalde, this custom of descent to the young-est son also prevails. That nation is composed totally of shepherds and herdsmen; and the older sons, as soon as they are capable of leading a pastoral life, migrate from their father with a certain allotment of cattle, and go to seek a new habitation. The youngest son, therefore, who continues latest with the father, is naturally the heir of his house, the rest being already provided for; and thus we find that among many other northern nations it was the custom for all the sons but one to migrate from the father, which one became his heir. — (Walsing. Upodiam. Neust, c. ].) So, possibly, this custom, wherever it prevails, may be the remnant of that pastoral state of our British and German ancestors which Cassar and Tacitus describe.

Ref. Third Real Property Report, p. 8; Year-Book, 36 Hen. VI. 20; Co. Litt. by Hargrave, 10 a, n. (3), n.

Borougu Fund is a fund instituted by the Municipal Corporations Act, 5 & 6 Will. IV. c. 56, which declares that the rents and profits of all hereditaments the interests, dividends, and annual proceeds of all moneys, dues, chattels, and valuable securities, belonging to the former body corporate of such borough named in the schedules A and B, or to any member or officer thereof in his corporate capacity, and every fine and penalty for any offence against this act, the application of which is not otherwise therein provided for, is to be raid to the treasurer of the borough, and to be carried by him to the account of a fund to be called "the Borough Fund." After the payment of all the lawful After the payment of all the lawful debts due by the late body corporate, this fund is to be applied towards the payment of the salary of the mayor, and of the recorder, and the police magistrate (where the latter functionaries shall be created), the malaries of the town clerk, treasurer, and every other officer appointed by the council; and other borough expenses specified in the act.

BOROUGH MATE is a rate levied within a borough by order of the council of the same, in terms of act 5 & 6 Will, IV, c. 56, which declares that when the borough fund shall not be sufficient for the purposes aforesaid, the council of the borough is hereby authorized and required from time to time to estimate, as correctly as may be, what amount will be sufficient for the payment of the expenses to be incurred; and in order to raise the amount, the council is authorized and required, from time to time, to order a borough rate in the nature of a county rate, to be made within their borough, for which purpose the council shall have all the powers within their borough that justices of the peace, assembled at their general or quarter sessions, have within their jurisdiction. Persons considering themselves ag-grieved by the rate may appeal to the recorder at the pext quarter sessions for the borough : or, in the case of no recorder within the borough, to the justices at the next quarter sessions for the county.

Bornellians, bor-rel'-li-ans, a sect of Christians in Holland, so called from their founder, Borrell, who was a man of some learning, particularly in the Greek, and Hebrew languages. They reject all public acts of worship, public prayer, and the use of the sacraments. They assert that the Christian churches have degenerated rated, because they have suffered the Word of God. which is infallible, to be interpreted by fallible men. They are said to lead austere lives, and to devote a considerable portion of their goods to charity.

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from April. In this view they were to be characterized by wind, ruin, snow, and aleet; and the broken weather that usually prevails about that time gave some colour to the notion.

BORSHOLDER. (See BOROUGE.) Bos. (See Boving.)

Boszesman, boszes-nda (Du., bush-man), an exceedingly diminutive variety of the Hattentot race, perfectly uncivilized and very savage in disposition. They inhabit that portion of Africa which lies north of Cape Colony. Some individuals of this tribe were arbitistical in this country of females and the were

Cape Colony. Some individuals of this tribe were exhibited in this country a few years ago.

Roskor, bos'-koi (Gr., the grazers), was the name given to a class of ascetic monks who lived in Syria and Mesopotamia, and are said to have subsisted solely upon roots and herbs. They did not inhabit any house, and professed to spend their time in the worship of God, in prayers and hymns.

Rose Loss (Fr. hosse) in Arch., an ornamental pro-

Boss, toss (Fr. bosse), in Arch., an ornamental projection covering the intersection of wooden ribs that cross each other, generally at right angles, dividing the surface of a flat or

vaulted ceiling into compartments. The boss is often beautifully carved into foliage or fretted work. and cometimes shields with armorial bearings are introduced, and representations of the human face, and heraldic emblems. It is most frequently introduced in quently buildings belonging to the Decorated English and



BOSS.

Perpendicular English styles of architecture. name is also given to the projection sometimes found in the centre of a shield.

BOSTANJI, bos'-tan-ye (Turk. bostan, a garden), lite rally signifies gardeners, but is applied to a class of men in Turkey who, in addition to acting as the sultan's gardeners, perform a variety of other functions, such as mounting guard in the scraglio, rowing the sultan's barge, and attending on the officers of the palace. Their head or chief, the bostanji-bashi, is one of the grand dignitaries of the empire; he has the rank of a pasha, is governor of the seraglio and the other imperial rosidences, steers the suitan's barge, and has the jurisdiction of the shores of the Bosphorus and the Sea of Marmera. This office is only conferred upon personal favourites of the sultan. The bostanji, at one time, amounted to 5,000 men, but at present their number does not exceed 600. They formerly did military duty in the field with the janissaries, and in war their strength was raised to 12,000 men.

Boswellia, tos-well-li-a, in Bot., a gen. of plants belonging to the nut. ord. Amyridacea. The most important species is *E. tharifera*, a tree which grows to a large size, in hilly situations, from the Coromandel coast to the central parts of India. This plant is the source of the valuable gun-resin known as Indian olibanum. (See OLIBANUM.) B. papprifera, a native of Abyssinia, also yields a fragrant gum-resin, and is further remarkable on account of its inner bark, which

peels off in thin white layers like paper. BOTANY, boil-di-ne (Or. botane, an herb), that part of natural history which relates to the vegetable kingdom. In its widest sense, botany comprehends all that is known of plants, and, therefore, forms a boundless field of inquiry. The student has to consider the external configuration of plants,—their structure, the functions which they perform, the relations which they bear to ach other, and the uses to which they are subservient. Many are deterred from studying botany by a miscon-ception of its scope and nature. Imagining that its ception of its scope and nature. Imagining that its sole object is to name and classify the various vegetable productions of the globe, they conclude that the study is confined to the acquisition of certain dry details and a vocabulary of hard words. Eighty-four years ago, some time before the natural system of Jussien was considerable portion of their goods to charity.

Bornowing Days, bor-re-ing, in the popular and Editorial temperature markable man, Gibert White of Equities of Scotland, and some parts of England, is schooled, alluded to this misconception, and clearly the name given to the last three days of March, from the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken the popular notion that they were borrowed or taken м 2

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"has always been, that it is a pursuit that amuses the fancy and exercises the memory, without improving the mind or advancing my real knowledge; and where the science is carried no farther than a mere systematic classification, the charge is but too true. But the botanist that is desirous of wiping off this aspersion should be by no means content with a list of names; he should study plants philosophically, should investigate the laws of vegetation, should examine the powers and virtues of efficacious herbs, should promote their cultivation, and graft the gardener, the planter, and the husbandman on the phytologist. Not that system is by any means to be thrown aside,—without system, the field of Nature would be a pathless wilderness,—but system should be subservient to, not the main object of, pursuit." To facilitate investigation, Botany has been divided into several departments, which may be regarded as separate sciences. The objects and scope of each of these sub-sciences will now be

explained.
1. Structural Botany, or Organography, includes everything relating to the organization of plants. It describes the different kinds of tissue which enter into the composition of plants; it explains the structure of every organ; and it also teaches the relation that one organ bears to another. That branch of structural botany which has reference to the elementary tissues is sometimes distinguished as Venetable Histology. The microscope has shown that the various tissues are composed of little membranous sacs or vesicles, varying in form and size, and united in different ways. (See CELL.). The study of these elementary organs cannot be prosecuted without the aid of costly instruments, but much may be learned from the clear descriptions and excellent illustrations given in modern botanical works, particularly those of Lindley, Balfour, and Bentley. Some plants consist of simple cells only, which continue throughout life to produce new cells, and to perform all the vital functions. A flowering plant, however, although originally cellular, produces organs composed of cells and vessels, variously modified and arranged, and covered by an epidermis (which see). These compound organs may be divided into nutrities, or those concerned in the nourishment of the plane, and reproductive, or those which are employed nume, and reproduction of those which are employed in the production of new individuals. The former are the stem, root, and leaf; the latter, the flowers and fruit. (See these words, also Ovulle, Pistriu, Sero, STAMEN.) Leaves occupy various positions on the stem and branches, and their arrangement forms a subjust for special state. subject for special study. (See Phyllotaxis.) arrangement of flowers on the floral axis and its ramifications, has also to be considered. (See Thypothesence.) The term Morphology has been applied to that portion of Organography, which treats of the abnormal modifications of the different organs. The researches which have been made in this department during the last forty years, have confirmed the doctrine advanced by the German poet Gothe, namely, that all those parts familiarly known as leaves, flowers, and fruit, are constructed on a simple uniform plan, out of one kind of organ in different states of modification and combination; and that there is no other difference between the flower of a rose and that of a nettle, than what arises from modifications and combinations of this typical organ, which is the leuf. elecidating this doctrine of the unity of type, which constitutes the basis of the theory of botany, Lindley says, "We are so accustomed to talk of plants bearing leaves, and flowers, and fruit, and it is so evident to our senses that extremely different organs do exist under such names, that it seems inconceivable that parts so very dissimilar should be only leaves in dif-ferent states; that the pure white petals of the fily, the rich red flowers of the rose, the sweet-smelling blossoms of the jusmine and orange, or the long trumpet-shaped corollas of the honeysuckle, should all be leaves; that the stamens in which the fertilizing powder is locked up, the pistils which are destined to receive the infinence of the pollen, the ovula that they contain, and finally, that the fruit which is the result of the action of the two last, are all so many parts formed out of one common organ, which in a particular and very frequent state is what we call a leaf. Botanists do not

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or a peach, is in a state of mental delusion, and that while he fancies himself to be enjoying the pleasure of gratifying his palate by the most delicious flavours, he is really only chewing the leaves of these plants; they assert that those appendages of a plant which are commonly called the leaves have a peculiar anatomical structure, and a certain relation to the stem on which they are borne, and, being developed according to certain fixed laws, are always arranged upon a certain and uniform plan with respect to each other; and that and the other organs, whether calyx, corolla, stamens, pistils, or fruit, have an anatomical structure essentially the same, bear the same relation to the axis that they grow upon, are developed according to the same laws, are arranged upon the same certain and uniform plan with respect to each other, and, finally, are constantly becoming transformed into leaves of the ordi nary appearance; thus losing the condition in which they are usually found, and reverting to their structural type." Morphology is a most attractive subject for Morphology is a most attractive subject for study, but less important in a practical point of view than that part of Organography which has reference to the ordinary forms of organs, and the manner in which they are arranged. No systematic arrangement can be understood without a knowledge of the laws upon which the symmetry of plants depends, and a practical acquaintance with the structure of every kind of organ.

2. Physiological Botany treats of plants in a living or active state, and of the manner in which their fund tions are performed; it explains how they are influenced by the several agencies of light, heat, air, and moisture; and it describes their various secretions and the nutriment afforded by the soil. It need searcely be said that any attempt to investigate the laws of vegetable life would be abortive without a perfect acquaintance with the more important details of organization. Plants, not being endowed with voluntary motion, derive their food either from the soil in which they are fixed, or from the atmosphere by which they are surrounded. The nutriment, consisting of water, generally holding salts in solution, is absorbed, by the aid of endosmose, by the extremities of the root. then passes from cell to cell, and ascends the stem, dissolving, in its course, some of the organic matter stored up in the vegetable tissue. Arrived at the green shoots and surfaces of the leaves, which are covered with minute openings, or stomato, the sap is exposed to the influence of light, heat, and air. About twothirds of the moisture taken up is now evaporated and exhaled; the remainder, which, of course, becomes thickened, undergoes certain chemical changes, and then begins to descend by the under-surface of the leaf, and along the bark. It takes either a direct or a circuitous course downwards, communicating with the centre of the stem by the medullary rays, depositing various secretions, more especially in the bark, and giving origin to substances which are destined to nourish and form new tissues. Finally it reaches the extremity of the root, where absorption had commenced; a small portion is there exercted, while the remainder mixes with the newly-absorbed fluids, and again circulates in the sap. (See Sar, Endosmose, Secretions.) The circulation of the sap has been adduced as an example of the vital processes elucidated by physiology, because it is due to the combined action of all the organs of putrition, and may therefore serve instead of several illustrations. The study of the instead of several illustrations. The study of the special functions of the various organs necessarily precedes that of the general physiological phenomens, each as circulation, assimilation, respiration, fertilization, and germination. Under the names of the different organs of nutrition and reproduction, the reader of this work will find full particulars respecting their functions. The physiology of reproduction is treated of at length under the heads Pollen and Embryo.

3. Systematic Botany, or Turonomy.—This department metudes the principles of classification, which

of the jasmine and orange, or the long trumpet-shaped corollas of the honeysuckle, should all be leaves; that the stamens in which the fertilizing powder is locked up, the pistils which are destined to receive the influence of the pollen, the ovula that they contain, and, finally, that the fruit which is the result of the action of the two last, are all so many parts formed out of one common organ, which in a particular and very frequent state is what we call a leaf. Businest do not not successfully and arrange plants in such a manner that the botanist may readly ascertain the name of any specimen, and arrange plants in such a manner that the botanist may readly ascertain the name of any specimen, and are the same time, get an insight into its true nature

and general properties. When it is considered that there are some 120,000 known species of plants, it is obvious that there must be a definite nomenclature and classification, were it only to facilitate reference and communication. Before plants can be classified, their peculiarities of structure must be clearly defined hence the necessity of the technical language which is employed in descriptive botany. This language ought not to deter the lover of nature from studying the principles of classification; for, in acquiring a know-ledge of the numerous technical terms, he will, at the same time, fix in his mind the ideas which they represent, and thus, in reality, become acquainted with unportant elementary facts. Botanists are blamed for using so many hard words; but it should be rememhered that they have to explain very minute points of structure, and must employ a language more rigorously defined than that of ordinary conversation. Botany," says Dr. Hoefer, "would be the most lovely of the defined than that of our says Dr. Hoefer, "would be the most lovely of the sciences, if botanists had not made its nomenclature so dry and repulsive. All the world would study it, if it was addressed less to the memory and more to the intelligence." The remarks of Mr. Page on the use of technical terms in geology may be fairly set in oppo-sition to the observation of the French writer:— "Scientific terms, when once thoroughly compre-hended, are quite as easily remembered as those derived from the language of every-day life; while, being chiefly compounds of Greek and Latin, they constitute a nomenclature intelligible to the scholars of every country. There is nothing more perplaxing than a nultiplicity of local and previncial terms; and one can easily imagine the confusion and obstruction that would arise were every country and district adhering to its own vernacular, instead of adopting a uniform system of terminology. The technicalities of science, often so ignovantly inveighed against, are, in fact, the instruments by which it effects its progress. New objects require new names, and new facts new phrases to express their relations; and the sooner the stu-dent can make himself familiar with those terms and their applications, the more rapid and pleasant will be his onward progress." That part of Systematic Botany which relates to the technical language of the science is sometimes called Glossology. The principles of classification constitute what is properly called Taxonomy, though this term is often applied to the whole department. There have been two great plans pro-posed for the classification of plants, one denominated artificial, and the other natural. The first is founded on characters taken from certain parts of plants only, without reference to others; while the second takes into account all the parts of plants and involves the idea of affinity in essential organs. In both artificial and natural systems, the lower divisions, namely the genera and species, are the same, the great difference between them consisting in the manner in which the genera are grouped into orders, and the orders into classes. (See Species, Genus, Orders, Class.) The plants in one of the higher divisions of an artificial system, such as that of Linnens, have no necessary allinity, and are connected only by certain characters, more or less superficial, which have been selected as the signs of that division. Such a system may, therefore, be compared to a dictionary, in which words are arranged, for convenience of reference, in alphabetical order, adjacent words not necessarily agreeing with each other, further than in commencing with the same letter. In a natural order, on the contrary, all the genera will be found to have a true family likeness; for their association is the result of a careful consideration of the structure of every organ. The classes in the natural system have been formed upon the same principle, by uniting orders which possess many important characters in common. The Lineman system leads to little more than a knowledge of names, and can only be looked upon as an index to the genera. superior to every artificial scheme previously promulgated, its day has gone by, and the more philosophical system has taken its place. Linnsus himself never intended it to be anything more than a provisional arrangement, and distinctly stated that a natural method was the great object of scientific inquiry. The general principles of the Linnaau, or Sexual system, may be explained in a few words. Twenty-four classes

are founded on the number, position, relative lengths and connection of the stamens; while the orders in these classes depend on the number of styles, the nature of the fruit, the number of the stamens in the classes where this character is not used for distinguishing them, and the perfection of the flowers. twenty-fourth class includes plants having inconspicu-ous flowers, and in it the orders are formed according to natural uffinities. Under these classes and orders, all the known genera and species are arranged. Even as an artificial method for discovering the names of plants, the Linnean system has many imperfections. Being based upon the more obvious characters of the reproductive organs, it cannot be of the least use when the plants are not in full flower, with all the stamens and styles perfect. The different flowers on the same plant often vary as regards the number of the stamens. Again, if the classification were carried out rigidly, it would separate, in many instances, the species of the same genus; but so sensible was Linnaus of the importance of maintaining the natural obstactor of his genera, that he sacrificed the symmetry of his scheme for the sake of keeping all the species together. natural system of classification is based upon the real affinities of plants, and necessarily takes into account all the organs. Though it can never be perfect until all the plants of the globe have been examined, it has already reached a very high point of develop-ment, and a great number of the orders which have been determined are quite as natural as the orders or differential the quite as natural as the orders in the animal kingdom. For example, those groups of plants designated as Ranunculacea, Gentianacea, and Atropacea, are as distinct in their characters as those animal groups named Cetacea, Cheiroptera, and Rodentia. (Nee Animal Kingdom.) Such being the case, it follows that a knowledge of one species is to a great extent the knowledge of many; for an indi-vidual, if well selected, will exhibit the most important characters of all the other plants in the same natural group. Thus, by studying the comeon radish (see RAPHANUS), or the mustard (see SIMARIS), the botanist may obtain a general knowledge of about 1,600 species which constitute the order Crucifera, and which are all formed, as it were, on the same type. The properties of plants accord in a very remarkable manner with their structure; and, as a general rule, the position of a plant in the natural arrangement indicates its proa plant in the natural arrangement indicates its properties. For example, if a botabist, on examining a plant, fluds all the structural peculiarities of the order just mentioned, he may feel confident that it is not poisonous, but most likely abaseorbutic or pungent, It, however, he should meet with one of the Atropaces, he might safely set it down as a plant possessing poisonous narcotic properties. Enough has been said to prove that the natural system is much more than a mere index to the names of plants. It reveals to a certain extent the plan of creation, and is at once an aid to research and a record of discovery. schemes based upon the natural affinities of plants have been devised. These may be regarded as so many versions of the one true system; for, though they have been worked out by different methods, they agree in nearly all their grand divisions. The characters by which the primary groups have been determined are furnished by the elementary tissues, and the most important organs of vegetation and reproduction. Regarding only the elementary structure, plants may be arranged under the heads of Cellulur and Voscular, according to the absence or presence of regular vessels. (See Tissue, Cell, Vessel.) A more satisfactory arrangement results from a consideration of the different modes by which plants are propagated. Some spring from true seeds, containing the radimentary organs called cotyledons; while others are developed from spores, in which no distinct organs can be traced. The former are said to be cotyledonous, and the latter acotyledonous (i.e. without cotyledons). As the number of cotyledous forms a natural distinctive character, the or coverage orms a natural asserted character, one first group of plants is subdivided into monocolfield-nons, having one cotyledon, and dicotyledonous, having two cotyledons. The mode in which the root is produced affords characters which confirm this arrangement. The young root of an acotyledon is heterophizal, but of a magnetical and that of a that of a monocotyledon is endorhizal, and that of a dicotyledon exerbizal. (See EMBRYO.) The three The three

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groups are further characterized by the stems; those of the first being acrogenous, those of the second endogenous, and those of the third exogenous. (See STEM.) Stemless plants are said to be thallogenous, and form a distinct section of the acotyledonous group. The venation of the leaves establishes the same great natural divisions; and similar results are obtained from a consideration of the flowers; monocotyledons and dicotyledons being phanerogamous, or flowering, and acotyledons tryptogamous, or floweries. The following table exhibits the relation of the different characters:

Embryo, Reticle. Stem. Flower.
Acctylede- Heterorhizal Acrogenous Cryptogamous.
Monocoty- Endorhizal Endogenous PhanerogaDiootyle- Diootyle- donous. Exorhizal Exogenous

The arrangement adhered to in this dictionary is that adopted by Professor Bentley in his excellent. Manual of Botany." It is founded upon the schemes of Jussieu, De Candolle, and Lindley, and may be thus described:—The vegetable kingdom is divided into two sub-kingdoms,—Phanerogamia, flowering or cotyledonous plants; and Cryptogamia, floweriess or acotyle-donous plants.

## Sub-Kingdom PHANEROGAMIA.

Plants which have evident flowers, and which are propagated by seeds containing cotyledons.

#### Class I .- DICOTYLEDONES.

Embryo dicotyledonous; germination exorhizal; the stem exogenous; leaves with reticulated venation; flowers with a quinary or quaternary arrangement. In this class there are two great divisions:—

Division 1. Angiospermia.—Ovules inclosed in an ovary, and fertilized indirectly by the action of the pollen on the atigma. In this division there are four sub-classes:—

Sub-Clear 1.—Thalamiflorie, or plants with flowers usually furnished with both calvx and corolla, the latter composed of distinct petals inserted on the thalamasis stamons hypogynous, or adherent to the sides of the overs

Sub-Class 2.—Calycifore, with flowers having usually cally and corolla, the latter mostly with distinct petals and inserted on the cally; stamens either perigyrous or epignous. This sub-class is divided into—1. Perigyrae, in which the cally is free, or nearly so; the stamens usually perigyrous, and the ovary superior. 2. Epignae, in which the cally is more or less adherent, and the ovary inferior.

Sub-Class 3.—Corollifora, flowers having both calyx and corolla, the latter with united petals; stamens inserted on the corolla or ovary, or free and axising from the thalamus. Sub-divisions:—L. Epigpaa, in which the calyx is adherent, and the ovary consequently inferior. 2. Hyposlandna, in which the stamens are inserted into the thalamus, and do not adhere to the corolla; ovary superior. 3. Epigetala, or Epigovolla, in which the corolla arises from the thalamus, and has the stamens attached to it; ovary superior.

Sub-Class 4.—Monochlamydex, or Apetelx, flowers having either a calyx only, or without both calyx and corolla.

Division 2. Gymnospermia.—Ovules maked, or not inclosed in an ovary, being fertilized directly by the action of the pollen.

## Class II .- MONOCOTYLEBONES.

Embryo monocotyledonous; germination endorhisal; stem endogenous; leaves usually with parallel seriation; flowers with a ternary arrangement. In this class there are three sub-classes:—

Sub-Class 1. Dietyogene. Leaves with a reticulated venation, decidions; rhizome and root with the wood arranged in a concentric manner; floral envelopes verticilists.

Sub-Class 2. Petaloida of Florida.—Leuves with a parallel venation, permanent: floral envelopes (perianth) verticillate, and usually coloured, rarely sculy sometimes absent. Eubdivisions:—1. Epigyna, in

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which the flowers are usually hermaphrofite; perianth adherent; ovary inferior. 2. Hypogynm, with flowers usually hermaphrodite; periauth free; ovary superior. 3. Diclines, in which the flowers are usually unisexual; perianth either absent or consisting of a few scales.

Sub-Class 3. Glumacea.—Leaves parallel-veined, permanent; flowers glumaceous, that is, having no proper perianth, but consisting of imbricated bracts.

# Sub-Kingdom CRYPTOGAMIA.

Plants which have no flowers, and which are propagated by spores. This sub-kingdom constitutes a class by itself, viz.

#### Class III .- ACOTYLEDONES.

Other characters besides those which define the subkingdom may be enumerated. The germination is indefinite or obscure; the stem is sometimes present and sometimes absent,—in the former case, when woody, it is acregenous; the leaves, when they exist, have forked veins; no true flowers are produced. There are two sub-classes:—

Sub-Class 1. Acrogena. — Plants with stems and leaves distinguishable, and possessing stemata.

Sub-Class 2. Thallagence. - Plants with no distinct stems or leaves; stomata absent.

For a full explanation of the above classes and subclasses, the reader is referred to the separate articles given under the different heads. The scheme devised by Professor Lindley is more symmetrical, and in many respects more philosophical, than any other; but the names given to the different groups have not been adopted by many botanical writers. The seven classes of this beautiful arrangement are distinguished by the following characters:—

Class I. Trailourns.—Asexual or flowerless plants, without proper stems or leaves.

Class II. Achogens.—Asexual or flowerless plants, with stems and leaves.

Class III. RHIZOGENS.—Sexual or flowering plants, with acotyledonous embryos and fractification springing from a teallus.

Class IV. Endogens. — Monocotyledonous flowering plants, with endogenous stems, parallel venation, and ternary symmetry.

Class V. DICTYGENS. — Monocotyledonous plants,

Class V. Dictrogens. — Monocotyledonous plants with reticulated yeartion.

Class VI. GYMNOGENS. - Polycocyledonous exogens, with naked seeds.

Class VII. Exogens.—Dicotyledonous plants, with seeds in a seed-vessel. These are arranged in four sub-classes.

Under the above heads Lindley places all the natural orders, which he arranges in groups termed Alliances. A brief notice of the progress of systematic botany may conclude this attempt to elucidate its leading principles. One of the earliest methodical arrangements was that of Casaloinus, a Romon physician attached to the court of Pope Sixtus V. This was entirely artificial; and the same may be affirmed of the several systems of Gesner, Morison, Rivinus, and Tournstort. That propounded by Tournefort was for a long time adopted by the French school, but was ultimately displaced by the attractive scheme of Linnaus, who must be looked upon as the great promulgator of the artificial method of classification. The first attempt at arranging plants according to their natural affinities was made by our great countryman John Ray, in the year 1682. His scheme was necessarily very imperfect, for the number of plants then known was comparatively small; still it was in its leading features correct, and has really formed the foundation of every later system. It was long neglected, and did not receive the attention it deserved until Jussien entered the field, and developed Ray's views of the natural affinities in the vegetable kingdom. Jussieu's method was first made known in the year 17st, just elecen years after the death of Linomia. Since that time, the natural method has been advanced by the labours of De Candolie, Brown, Endlicher,

Lindley, and many others.

4. Geographical Botany treats of the manner in which plants are affected by climate and station, and endeavours to determine the conditions under which parti-

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## Botany-Bay Kino

cular families or species of plants are confined to certain zones of latitude and altitude. It is a study of great zones of latitude and altitude: It is a study of great-interest, and one which cannot be successfully proce-cuted without an intimate acquaintance with most of the sciences. Of course, so long as there are vast tracts of continents unexplored by botanical travellers, the knowledge upon which this depayment is founded

must be imperfect. (See DISTRIBUTION OF PLANTS.)

5. Fossil Botany investigates the nature of the plants found in a fossil state in the various geological formations. It is therefore at once a branch of botany and

of geology. (See Palmontology.)

The practical bearings of botany are most important. and are sometimes treated separately in manuals of the science, under the head of Economic Botany. All the principal plants affording food, timber, medicine, tibres, dre-stuffs, and other useful products, are noticed in this work under the names of the genera which include them. Many arts and sciences closely connected with botany are explained in separate articles. (See Materia Mindoa, Agrenia Mindoa, Agrenia Mindoa, Agrenia Mindoa, Agrenia Mindoa, Gardenino, Physical Grography.)—Ref. Lindley's Vegetable Kingdon and School Butany; Balfour's Manual of Bolany, Class-book of Bolany, and Bolanis's Companion; Bentley's Manual of Bolany; Babington's Manual of British Bolany; Catlow's Popular Field Bolany.

BOTANY BAY KINO. (See EUCALYPTUS.)

BOTE, bote, is an old Saxon word signifying belp, succour, aid, advantage, recompense, satisfaction, or amends; and is equivalent to eslover, which is derived from the Fr. estaffer, to furnish. It is an allowance of wood for fuel, repairs, and the like, and which every tenant for life, unless restrained by covenant or agreement, may, of common right, take upon the land for his reasonable service, without being impeachable for committing waste. The word is generally conjoined with another to express its nature; as bridge-bate. which is an allowance for making or repairing a bridge; fire-bote, or house-bote, for fuel; plough-bote and cart-bote, for making and repairing implements of hus-bandry; hay-bote, or hedge-bote, for repairing hedges and fences. &c. The term bote and its compounds, and fences, &c. however, though technically proper, have in modern times somewhat fallen out of use.

Bor-FLy, both-fit (Conida).—Although most of these insects are incapable of taking nourishment when in their perfect state, from the obsolete nature of their mouths, they are nevertheless to be regarded as among the greatest pests that afflict catile. During their larva state they are all parasitic upon the various berbivorous animals, some of them harbouring in the skin, and there in the internal cavities of their bodies. In horses these posts are called bots; in sheep, maggots; and in oxen, wornibe. Of the internal parasites, some live in the frontal sinuses of sheep and deer, the parent laying her eggs in the nostrils of the animal, whence the larva creeps up to its destmed abode; whilst others (the bots) make their way to the very core of the animal's intestines. The eggs of these latter are laid upon the skin of the horse in such positions as are easily reached with his tongue. This selection of situupon the sam of the norse in some positions as are easily reached with his tongue. This selection of stuation, however, is not invariable, nor, according to Newman, need it be, to insure the bot's purpose. He says, "All naturalists must have observed how commonly the eggs of the bot are deposited on that part of a horse's shoulders which he can never reach with his mouth; and thus, to a casual observer, it would seem that they must perish, and full in the object for which their parent designed them. Now there is a provision of nature which exactly counteracts this difficulty. When horses are together in a pasture, and one of them feels an irritation on any part of the neck or shoulder which he cannot reach with his mouth, he will arbble another horse on the corresponding part of his neck or shoulder, and the horse so nibbled will immediately perform the and the horse so nibiled will immediately perform the kind office required of him, and begin nibbling away at the part indicated." After the eggs have remained among the hair of the horse's hide four or five days, they arrive so near maturity that the least additional heat is sufficient to hatch them. This additional heat is supplied by the application of the friendly horse's lips and tongue; the larve are liberated, and, adhering roudly to the moist surface of the horse's mouth, are conveyed straight to his intestines. It is satisfactory

# Botrytis

to learn that opinion is at least divided as to whether the bot-fly in the horse's stomach is hartful. The horse has an instinctive horror of this insect, and, a soon as it flies near him, he gallops round the field soon as it mes near nim, he gallops round the field or inclosure until he is in a profuse perspiration, and then comes to a sudden stop, in a state of tramer. The fly makes a most delicate poise on the wing, and then suddenly darts at the horse and deposits an egg. This is repeated until several hundreds are affixed to the heirs, generally of the leg. When the larves become perfect, they pass from the body of the animal with the dung, in which they remain until they are matared into a fly. They frequently attach themselves, by hook-like process, near the anus of horned cattle, and drop with the dung. In the summer months oxen frequently stand in a pond or pool for a considerable time, their instinct leading them to this course in order that they may effectually get rid of their future enemy.

BOTHER, both'-e (Gaelic bothag, a cot), is a name given in the Highlands of Scotland to a hut, or the meanest sort of cottage; but latterly the name has come to be applied to the houses in which the unmarried farm-labourers are lodged, in different parts of Scot-These last are usually of the most wretched tion. Frequently a number of young men are description. thus crowded together in a single apartment, where they have to eat, sleep, dress, and prepare their own meals. They have thus without any control, and great laxity of morals is the consequence. In some places there are also bothies for unmarried female farmservants, which are still more reprehensible. During the last few years, popular attention in Scotland has been much directed to the evils of the bothic system, both through the platform and the press, and it has been almost universally condemned. No one has done more to overthrow this system than the Rev. Dr. Begg. of Edinburgh.

of Editinurgh.

BOTHRODENDRON, both!-ro-den!-dron (Gr. bothros, pit. dendron, tree), in Geol., a gen. of iossil stems, with dotted surfaces, occurring in the coal-measures. and distinguished from Sigillaria and Stigmaria by two opposite rows of deep aval pits, which appear to be the sears left by large cones or seed-bracts.

BOTONOMENCY, of to-on-omes seed-oracts.
BOTONOMENCY, of to-on-omes seed-oracts, a plant, manteio, divination), a method of inquiry into the future by means of plants. The plan, sometimes adopted by young ladies, of picking off the petals of flower, one by one, to see whether a certain event will or will not happen, is one way of practising botono-mancy. This species of divination was anciently prac-tised by writing a number of letters or words upon leaves, and then exposing them to the wind, when the answer was attempted to be made out of those that Sometimes the noise or crackling of leaves remained. when crushed between the hands or cast into the fire was the mode resorted to.

was the mode resorted to.

Bothy clearing the description of the division of grapes), in Bot., a gen. of ferns of the division ophinglosses. The only British species is B. lanaria, commonly called Moonwort, a little fern common on mountain pastures. B. virginicum is found in many parts of America, Asia, and Africa; but in Europe it is strangely contined to Norway. Its fronds, which are large and succulent, are boiled and eaten in the Himsland Naw Zouland cond. Conference of the Principles of the condition of the parts of the condition of the co

the Himalaya, New Zealand, and a few other parts.

Borryothal, bot'-ri-oi-dal (Gr. botrus, a bunch of grapes), in Min., a term applied to masses occurring in a concretionary form resembling bunches of grapes. Certain limestones and hamatites are found in this

BOTHYOLITE, hot'-ri-o-lite (Gr. botrus, a bunch of grapes, eidos, like), datholite or boro-silicate of lime, occurring in a botryoidal form at Arendahl, in Norway. It is also found near Lake Superior in such large quantities, that it has been used as a flux for

#### Bottle-Pish

name of suscersiss, is produced by one or more; a disease to which turnips are particularly hable is connected with the growth of the species B. parasities; and the much-dreaded potato disease is confidently sacribed by many observers to B. infeatans.

Horrus-Fiss (Sacopharyux ampullaceus), a very singular fish, belonging to the gen. Sacopharynx. Only two specimens of the genus have been taken, and, with the exception of size, they realize many of the fabulous accounts of the sea-server. One was exacult in the

accounts of the sea-serpent. One was caught in the chtrance to Davis' Straits, and measured four feet and half, and the other between Iceland and Labrador, it was fix feet long. The most singular fact connected with the bottle-fish is, that its oody is capable of being inflated like a leathern bot-



tle, and it has along slender tail like a whiplash. It has a pointed mout, and its

mished with long sharp teeth. Under the smail pec-torals the three branchials can be seen through the irregularly-shaped gill-openings; and the extensibility of the jaws is greater than that of the serpent tribe. It has a slightly granular, but soft, loose, and slimy skin, and is very voracious; one of the examples referred to was discovered to have swallowed a fish longer than its own body, and the other a sea-perch thicker than itself.

BOTTLE PAPERS, bot'-tel, is a term applied to those papers that are inclosed in bottles and cast into the es. Sometimes intelligence of the sinking or destruction of a vessel is communicated in this way; but they are commonly made use of in showing the drifts and currents of the ocean. In such cases the ship a name, the latitude, longitude, date, &c., are written down on a slip of paper, which is then put into a bottle, properly secured, and cast into the sea. These papers are frequently drifted away into very distant localities, and, when picked up, often supply useful information to the hydrographer.—Ref. Nautical Magazine for Sept., 1837.

BOTTLES (Fr. bouteilles). — The manufacture of bottles is one of considerable importance. This may be seen from the fact that France uses annually over 60,000,000 of bottles for wine alone. The bottle manufacture of Great Britain is very After supplying our own wants, which flourishing. are enormous, we export common bottles annually to the amount of over £300,000. Bottles destined to contain acid, or effervescing wines, are made with particular care, a machine having been invented for testing their strength. Before this the loss of champague bottles by bursting was nearly 30 per cent. For soid wines the glass should contain a slight excess of silica : otherwise, the lime or alkali left uncombined is acted upon, and the bottle corroded. For more information on this subject see GLASS MANUFACTURE.

Borrom, bot'-tom, a term frequently used it com-mercial language to denote a ship, as when we speak of goods imported in foreign bottoms, or in British bottoms. The word is derived from the Dutch bodem, which originally signified the bottom or keel of a ship, but came afterwards to be used also for the whole resel. The term is also used in both senses in Euglish.

Borrow Beds, in Geol., the name sometimes given to some partially or doubtfully fossiblerous strata which immediately underlie the Silurian system in Wales.

BOTTOMEY, bot tom-re, in Law and Com., is in the usture of a mortgage of a ship, and is said by Blackstone to have originally arisen from permitting the master of a ship, in a foreign country, to hypothecate the thip, in order to raise the money to refit.—(2 Bl. Com. 457.) It arises when the owner takes up money to conside him to carry on his voyage, and pledges the keel or bottom of the ship (partem protanto) as a security for the repayment; in which case it is understood that, if the ship be lost, the lender loses the whole of his money; but if it returns in safety, then he shall receive back his principal, and also the premise or

## Boulders

interest agreed upon, however it may exceed the legal rate of interest, it being considered in the nature of an rate of interest, it being considered in the nature of an insurance, and not usery. And this is allowed to be a valid contract in all trading nations. In this case, the ship and tackle, if brought home, are answerable (as well as the person of the borrower) for the money lent. But if the loan is not upon the vessel, but upon the goods and merchandise, which must necessarily be sold or exchanged in the course of the voyage, then only the borrower, personally, is bound to answer the con-tract, who, therefore, in this case, is said to take up money at respondentia. These terms are also applied to contracts for the repayment of money borrowed, not on the ship and goods only, but on the mere hazard of the voyage itself; when a man lends a merchant £1,000, to be employed in a beneficial trade, with condition to be repaid with extraordinary interest, in case such a voyage be safely performed; which kind of agreement is sometimes called faxus nautious, and sometimes usura marilima. But as this gave an opening for usurious and gaming contracts, especially upon long voyages, it was enacted by the statute 19 Geo. II. c. 37. that all moneys lent on bottomry or respondentia, on vessels bound to or from the East Indies, shall be expressly lent only upon the ship, or upon the merchandise; that the lender shall have the benefit of salvago; and that if the borrower have not an interest in the ship, or in the effects on board, equal to the value of the sum borrowed, he shall be responsible to the lender for so much of the principal as bath not been laid out, with legal interest and all other charges, though the ship and merchandise be totally lost. The observation and merchandise be totally lost. The observation above as to the rate of interest applies to the laws of each particular country fixing the legal rate to be taken, the usury laws in England baving been re-pealed.

BOTTONNY, bot'-ton-ne (Gr. botane, a plant), in Her., the name given to a cross the ends of which terminate in three semicircular projections, giving them an appearance resembling the trefod in form.

BOUDDIR, boo'-dwaw (Fr.), a lady's small private apartment, in which she receives only her most intimate friends. Boudoirs became very fashionable in France during the reign of Louis XIV., and were frequently adorned in the most luxurious and fantastic manner.

 BOUGET, boo'-zhai (Fr. bouget), in Her., a charge of peculiar form, representing an ancient vessel used for the purpose of carrying water.

BOUGHT AND SOLD NOTES, in commercial trans-actions, are notes of sale signed by a broker employed to sell goods, and by which the bargain is completed. They contain the conditions of the bargain, and are afterwards delivered to the principals for implement.

Bougis, bon-zhe' (Fr.), a surgical instrument used for opening obstructed passages of the body; as the urethra, rectum, resophagus, &c. It is long and slender in form, solid or hollow, stiff or flexible, according to its particular use, usually varying from 4th to 14th of an inch in diameter. It is made of various substances, as German silver or pewter, gum-elastic, catgut, &c. One kind is also made by dipping a fine cord or thread of flax or silk in melted wax until it has acquired a sufficient thickness, when it is rolled smooth and firm on a marble slab. Bougies require to be employed with skill and caution, as there is always a considerable degree of danger attending their use. If used at all by inexperienced hands, the utmost caution should be observed, as much injury may arise from any hasty or violent efforts to remove the resistance that may present itself; it is rather to be overcome gradually and by repeated attempts, so as not to excite much pain or irritation.

BOULDER CLAY. (See DRIFT.) BOULDERS, bule'-ders (Sux.), in Gool., any rounded or waterworn blocks of stone too large to be included under the heads of "pebbles" and "gravel." The term erratic boulders is generally applied to the detached masses of rock which are foundlying upon the surface, and which have been washed out of the clays of the Glacial epoch, or brought separately from their original sites by icebergs. They are often found resting on hill-tops, which during the Glacial period were banks and shallows in the sea, and so arrested the laden icebergs in their course. The largest boulder known in the British islands is near the head of the Devil's Glenis

#### Boulevard

custy Wicklow. It is 27 feet long by 18 wide, and 15 county Wicklow. It is 27 feet long by 18 wide, and 15 high. It is of granite, resting on Cambrian grits and slates, six or eight miles from the nearest granite is sta, with a wide shallow saley between the hill on which it now stands and the granite district. Very large erratic blocks of Scandinavian rocks are scattered over the plains of Denmark, Prussis, and northern Germany. The monolithic pedestal of the statue of



ERRATIC BOULDERS.

Peter the Great at St. Petersburg was hewn out of a boulder weighing 1,500 tons, that lay on a plain not far from the city. (See DRIFT, GLACIER, PLRISTOCRNE.)

ROULEVARD, or BOULEVART, book-road (Ger. bolk-werk; Eng. bulwork), is a French term denoting the outer fortifications or ramparts of a town. Many of these have now been levelled, the ditches filled up, and the space laid out in public gardens, parks, and pro-menades firely shaded with trees, but still retaining their old name. The boulevards of Paris are the most magnificent of their kind.

Buguincent of their kind.
Boulings, how'd homs (Gr. bon, great, and limos, hunger), is a word used in medicine to denote a canine or vorncious appetite. The terms canina or bound fames (Lat. canis, a dog, or bos, an ox, and fames, hundranes) ger), are sometimes used in the same sense.

BOUNDARIES OF CITIES AND BOROUGHS, boun'-dores (Nor. boune, a limit), in England, are declared by the Municipal Corporations Act, 5 & 6 Will. IV. by the Municipal Corporations Act, 5 & 6 Will. IV.
c. 76, to be the same as those settled and described
in 2 & 3 Will. IV. c. 64, being entitled "An Act
to settle and describe the divisions of counties and
the limits of cities and boroughs in England and
Walca, so far as respects the election of members
to serve in parliament." This act was, in some points,
subsequently anended by 6 & 7 Will. IV. c. 103. Act 7 Geo. IV. c. 64. declares that when any felony or misdemeanour shall be committed on the boundaries of two or more counties, or within 500 yards of such brimilaries, or shall be begun in one county and complette in another, such may be dealt with and tried in

BOUNDARIES OF PARISHES depended upon ancient usage, and were not limited by not of parliament until the passing of the statutes after mentioned; and where these have not been applied, the usage still exists; and in many places great care is taken to perpetuate the memory of the boundaries by perambulations from time to time, which are called beating the bounds. In some places parishes seem to interfere, when some place in the middle of one purish belongs to another that is distant; but this has generally happened by a unity of possession, when the lord of the manor was at the charge to creet a new church, and make a dis-tinct parish of his own demesnes, some of which lay in the compassor another parish. Some lands were never

# Bounty

at all united to any parish, and remain to this extra-parochial. The oustom of perambulating pariduring Rogation week (the next but one before W Sunday) was first introduced, with other Romi monies, by Claudius Mumertus, a French bid Vienne, in the year 550, whose precedent was social vienne, in the year 550, whose precedent was social afterwards repeated by Sidonius, bishop of Clermont, and at length established by the council of Orleons. The regulation of Queen Elizabeth relating to the East first regulation of Queen Litzaueth remains to the coa-glish ambarvatia, or processions, is as follows:—"The people shall once a year, at the time accustomed, with the curate and substantial men of the parish, walk about the parishes, as they were accustomed with willow wands), and at their return to church, make their common prayers; provided that the said ourste, in the said common perambulations, as heretofore in the days of Rogations, at certain convenient places, shall admonish the people to give thanks to God, in the beholding of God's benefits, for the increase and abundance of his fruits upon the face of the earth, with the saying of the hundred and fourth Psalm, Benedic anima mea, &c., at which time also the same minister shall inculcate this and such-like sentences, Cursed be he which translateth the bounds and doles of his neigh-bour,' or such other order of prayer as shall be hereafter appointed." Parishioners being legally entitled to make these perambulations, it has been held that they may justify going on a man's land, or into his house, if on the necessary track. In the case of Taylor v. Devey, 7 Ad. & Ellis, 412, Lord Denman, in giving the judgment of the court, said,—"The right to perambulate parochial boundaries, to enter private proamounte percental boundaries, to enter private pro-perty for that purpose, and to remove obstructions that might prevent this from being done, cannot be disputed. It prevails as a notorious custom in all parts of England, is recorded by all our text-writers, and has been confirmed by high judicial sanction." In the city of London the custom is, in most parishes, exercised yearly on Ascension-day, or Holy Thursday; and the inns of court and other extra-parochial places bar out, by shutting their gates. By the statute for commutation of tithes, 2 & 3 Vict. c. 62, the tithe commissioners are authorized to adjust the ancient boundaries between parishes and townships, or to define a new boundary, as they shall think fit; which adjustment is declared to be binding for all purposes whatever. And by 8 & 9 Vict. c. 118, s. 39, similar powers are intrusted, under certain circumstances, to the inclosure commissioners for England and Wales. The boundaries of the town-ship and parish of Wolverhampton were, in many parts, marked out by what are called Gospel trees, from the custom of having the Gospel read under or near them by the clergyman attending the perochial perambulations.

BOUNDARY SURVEY OF IBELIND. (See SURVEY, ORDNANCE.)

BOUNDING CHARTER, OF INFEPTMENT, boun'-ding, in Scotch Law, is a charter or infettment which describes the lands by their boundaries or marches. Such a description confers right to all within the bounds, and on the other hand, excludes whatever lies beyond. If described as bounded by certain walls, these will not be held as conveyed, unless this be expressly stated; and where it is intended that the wall should be mutual, this must be expressed.

BOUNTY (Fr. bonte), in Pol. Ec., is a premium paid by government to the producers, exporters, or importers of certain commodities, with the view of encouraging the prosecution of these branches of industry. system arose out of the notion that there were certain kinds of industry which it was specially the interest of the government to encourage or to prevent from falling into decay. Bounties were at one time very numerous in this country; but since the appearance of Adam Smith's "Wealth of Nations," wherein their impolicy is clearly pointed out, the system has fallen into disrepute, and is now almost universally condemned.
According to that author, a trade is only in a natural According to that author, a trade is only in a natural condition when its produce is sold for a price which replaces the whole capital expended in production, and leaves something over in the shape of profit. When this is not the case, and when the goods can only be sold at a loss, the manufacturer will cease to produce an unprofitable article, unless the government comes forward with a bounty to establish an equilibrium be-

## Bounty

tween the cost of production and the market price.
"The bounty," says Adam Smith, "is given in order to make up this loss, and to encourage a man to continue, or, perhaps, to begin a trade of which the ex-pense is supposed to be greater than the returns; of which, every operation eats up a part of the capital employed in it, and which is of such a nature, that if all other trades resembled it, there would soon be no capital left in the country. . . The effect of bounties, therefore, can only be to force the trade of a country into a channel much less advantageous than that in which it would naturally run of its own accord." system of bounties entirely ceased in this country in 1830, unless one may class under this head the large parliamentary grants made to certain steamboat com-panies to run boats for the carriage of the mails, analogous to, and closely connected with bounties, is the system of drawback of duties allowed upon the exportation of certain articles, which still continues to ene extent. (See Drawback.)
BOUNTY, or QUEEN'S BOUNTY, is a sum of money

given by government to persons enlisting in the army or navy, in order to induce men to enter these services. The amount of bounty naturally varies with the demand for men, being sometimes as low as £2 or £3; while at other times, as during the war against Napoleon, it has been as high as £20 or upwards. Formerly, a great part of the bounty was usually kept back, under the plea of being payment for certain articles furnished; but recently an outcry was made against this practice, and a sw the recruit receives the whole amount of the

bounty in cash.

BOUNTY, QUEEN ANNE'S.—The profits of the first-fruits and tenths which were anciently given to the pope were, by Henry VIII., appropriated to the crown. Queen Anne restored this source of revenue to the Church, and caused a perpetual fund to be es-tablished, the revenue of which, after payment of certain charges and pensions, was vested in certain trustees for the augmentation of poor livings under £50 per annum. This fund has been further regulated by subsequent statutes. The trustees are certain dignitaries of the church, and other official persons for the time being, and are incorporated under the name of " the Governors of the Bounty of Queen Anne, for the augmentation of the maintenance of the poor clergy. They have authority to make rules for the distribution of the fund, which are to be approved by the king under his sign manual. The sum received by the governors of this bounty for the year ending 1853 was £233,070, and they expended £243,136.

Bouquer of Wink, boo'-kai (Fr.), the odorous principle or perfume in all wines, partly derived from the grape and partly from fermentation. It has some of the characters of an essential oil, and in some wines of the characters of an essential oil, and in some wines is present in small quantities, and is very evanescent; while in others it is abundant and persistent. According to Pelouze and Liebig, the bouquet of wines, which they consider to be a substance formed during fermentation, is a true ether, namely, a combination of oxide of ethyle with conanthic acid.

Bourson Tra. (See Angrecum.)

Bourselsie, boorzh-waw-ze (Fr. bourg, a town), is a French term, literally signifying the inhabitants of a town, and is employed to denote a class of society in

town, and is employed to denote a class of society in France who inhabit the towns, and are intermediate between the nobility and the lowest class of the people, including merchants and manufacturers down to master tradesmen. Under the ancient monsrchy it com-prised all those who were called upon to partake in the duties or participate in the expenses of the town in which they were domiciled. The bourgeoisie of the large towns have often played an important part in the history of the country. They are not to be confounded with the citoyess, a general term applied to all who are members or citizens of the state.

BOURIGEONISTS, boo'-reen-yo-nists, in Eccl. Hist., a was born at Lisle, in France, 1610. She pretended to was born at Liste, in France, 1816. She pretended to particular inspirations, and set herself up as a religious preferred by the English howmen. It was considerably with very singular notions. She found a number of less cambrous than the cross-bow, and more than followers, one of the principal of whom was Peter Poiret, an able and less ned man, who, in his "Divine Resonance," attempted to reduce the substance of Bosonance, and so the substance of Bosonance, and substance of Bosonan

#### Bow

rignon's fancies to a regular system. One Dr. Garden of Aberdeen, who wrote an apology in their favour, was condemned and deposed by the General Assembly in 1701. The works of Bourignon were published by Poiret at Amsterdam, 1676-84 (2nd edition 1717), and

cocupy 25 volumes.

Bournonire, boor no nite, a mineral occurring at Budellion, in Cornwall, in steel-grey tabular crystals, or massive granular aggregations. It is a mixed aulphide of antimony, copper, and lead. It is often found in masses resembling a cogged wheel, and is thence called

wheel-ore. It is also known as Endellionite.

BOURNOUSE, boor-noose, a large woollen maptle with a hood, which is thrown over the head in wet weather. It is worn by the inhabitants of Algeria and other parts of Northern Africa. The bournouse is put over the rest of the attice and is addressed as a put over the rest of the attire, and is coloured as as to suit the fancy of the wearer. White, however, is the principal colour. The name is Arabic, but amongst the Spaniards this garment has long been known under the name of albornoz. Since the conquest of Algeria by France, the term has been applied to a lady's cloak with a hood attached behind, which somewhat resembles the Arabian bournouse.

BOURSE. (See EXCHANGE.)

BOUSTROPHEDON, boo-strof-e'-don (Gr. bous, an ox, and strepho, I turn), a term used to denote that mode and excepts, I turn), a term used to denote riar mode of writing which was practised by the Greeks in the earlier period of their history. Instead of each line proceeding from left to right, they proceeded from left to right and right to left alternately, so that each line commenced at the side at which the previous one terminated, like oven in ploughing, and hence the name.

Bousy, boo'se (Ang. Sax.), is applied to one who is intoxicated or who drinks lavishly. It is said to be derived from buyse, the Dutch name of a large drink-

ing-cup with two handles.

With a long legend of romantic things Which in his cups the bousy poot sings

Druden.

Bours Rimes, boo-re'-mai (Fr., rhymed endings), a social amusement, which consists in making lines to suit certain rhythmical terminations which are given. It is said to have originated with one Dulot, a French mediocre poet of the 17th century, and was at one time extremely popular in that country. In fixing the bouts, it is usual to choose such as seem the remotest and have the least connection.

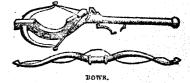
Bovza, boo'-za, a kind of beer made from the grains of an Abyssinian corn-plant called Toff. (See Pos.)

BOVIDE, bo'-vi-de (Lat. bos, boxis, an ox), the hollowhorned ruminating animals belonging to the class Mammalia, order Reminantia. The species belonging to this family are hoofed, their stomachs being adapted for chewing the end. Their frontal bones are usually provided with hollow borns. In this family are included, Borina, the oxen; Giraffina, the giraffes; Cervina, the deer; Moschina, the musk-deer; and Camstina, the camels.

Bow, bon (Aug.-Sax.), in Mar., is that portion of a ship's side which forms an arch towards the stem. tre are two kinds of bows; viz., lean, or narrow, I luff. or broad bows. The former of these is best and luff, or broad bows.

calculated for swift sailing.

Bow, one of the oldest of weapons, in the use of which the English, during the Middle Ages, were extraordinarily expect. In the annexed illustration are shown the long-bow and the arbulest, or cross-



Bow

to is. id., a sheaf of arrows costing from is. to is. 2d. Some long-bows were made of the shape shown in the cut,—a double arch connected by a straight piece. (See

ARBALEST, ARCHERT.)

Bow, in Mus., a stick of hard elastic wood, along which are stretched horse-hairs, the tension of which is regulated by a screw. It is used for playing upon instruments of the violin kind, and varies in vize, the double-bass and violoncello bow being much stiffer and stronger than that of the violin.

BOWDICHIA, ho-dik'-i-d, in Bot., a gen. of plants belonging to the nat. ord. Leguminosæ, sub-ord. Papidionaces. The only species requiring notice is B. virgilioides, the bark of which, with that of one or more species of Byrsonima, forms the American alcornoco

bark of commerce. (See BYESONIMA.)

BOWIE-KNIFE, bo'-e, the name of an American sharp pointed weapon, bearing a close resemblance to the French contenu de chasse, or English butchers'-knife. A story is told of its having been introduced into America by a certain Col. Jim Bowie, of Texas, who acquired great notoriety by the skilful manner in which he wielded the weapon in his hand-to-hand encounters with Mexicans and others. In the Southern States of America it was commonly carried in a sheath secreted comewhere about the person.

BOWING, OF WORSHIPPING TOWARDS THE EAST, Was the practice of the Church from a very early period. Various reasons have been assigned for this custom; as, the appearing of the star in the east at the birth of Christ; the rising of the sun in the east being emble-matic of the rising of the Sun of Righteousness; the belief that Christ would make his appearance in the east when coming to judge the world. Hence it became customary to place the altar and other sacred symbols at the eastern extremity of the church. The west, on the other hand, was regarded as the place of Satan and darkness; and hence, when they renounced their sins, they looked towards the west, and then turned about to the east to make a covenant with Christ,

Bowing THE HEAD, in the early Christian church, was considered as a posture of worship, and inter-mediate between standing and kneeling. It was observed principally in receiving the hislop's blessing, and in all direct and formal addresses to God for his In the early mercy and favour upon the people. church it was also usual to how the head whenever the name of Jesus occurred in the service, and in the Church of England this is still done in repeating the

Creeds.

BOW-LINE, in Mar., a rope fastened near the middle of the lecch, or perpendicular edge of the square sails, by three or four suindinate parts called bridles. It is only used when the wind is so unfavourable that the sails must all be braced sideways, or close-hauled to

Bowns, boles (Fr. boule), a favourite game in Britain, played upon a smooth, grassy surface, either square, circular, or oblong, used only for the purpose, and called a bowling-green, which is surrounded by a trench about half a foot deep. Bowls are made from a black, green wood, called lignum vitæ (Guaiacum officinale); they are nearly round, and have a diameter of six or oight inches, with a bias to one side. The party playing may consist of two, four, six, or eight, and is gene-The party playrally chosen after tossing up a coin to decide who shall have the first choice. The sides being selected, each player has two bowls, which are marked with numbers, thus distinguishing the players. The sides being s iested, the leader of the game sends off a small white ball from one end of the bowling-green to any distance he pleases. This small white ball is called the jack, and the leader throws his first bowl so as to place it as near the jack as possible. He is then followed by one of the adverse party, the partner of the first following, and so, in rotation, till all the bowls are played. The some is won by the side whose bowls are nearest the jack. The number of points required to make the game is arranged beforeland; 7, 14, 21, or 31, are the numis arranged beforeland; 7, 14, 21, or 31, are the numbers usually fixed. Great disappointment often happens to a player when his bowl, after being placed close to the jack, is removed by a blow from a subsequent player's bowl. This is called a "rub." Hence the old lines to a player's bowl. This is called a "rub." Hence the old lines of the player's bowl is a blow in must expect rubs." Under Ivan, a number of these privileges and immunities. Some are weighted or bissed on one side, in order the method that the lease time, offices were best of the method that the lease time, offices were best of the method that the lease the lines of the country, and stood in somewhat the same relation to the must be a more than the same time of the same relation to the must be a more than the same time of the same relation to the must be a more than the same time, offices were best of the more than the same time, offices were best of the must be a more than the same time, offices were best of the must be a more than the same time, of the must be a more than the same time, of the must be a more than the same time of the must be a more than the same time.

Boyer

that the player may be able to bowl towards the jack in a curved direction. A fore-hand bowl is played with a curve from the fight, and a back-head bowl with a curve from the left. If a bowl goes into the dison without striking the jack, it does not some; but if it strikes the jack and goes into the ditch, it reckons as if it were upon the green. When the jack itself is knocked into the dich, it is replaced upon the green, in the place nearest to where it lay in the dich. The game of bowls was prohibited in England during the reign of Henry VIII. by set of parliament; that law, however, was repealed in 1835. It has always been a favourite matrime in the Reitish isles pastime in the British isles.

Bowls, AMERICAN, is a game of modern invention, cently introduced into England from across the Atlantic. It is played in saloons fitted with alleys of from fifty to sixty-five feet in length, and about four in width. The alley has a "gutter," as it is called, on each side, and is very slightly convex in the centre, regularly bevelled to the sides. At the further extremity of the alley are set up, in the form of a pyramid, ten pins, usually of ash-wood, about a foot in height and 2 lbs. in weight. The spex of the pyramid turned towards the howler, who rolls wooden balls, generally of lignum vites, with the object of knocking down as many of the pins as possible at each roll. The pins, when set up, are called a frame, and at each frame the bowler rolls three balls, when the number of pins down is counted to him, and the frame is set up again for the next bowler. A game ordinarily consists of ten frames, or thirty balls. If the bowler takes all the pins with his first ball, he counts ten; the frame is again set up for his second ball, when, if he again takes all, he counts ten more, and the frame is again set up for his third, when, whatever number he scores with the three balls, count to him as if all had been made off one frame. If he take all the ten pins with his first two halls, he is entitled to a fresh frame for his third or last ball. This is technically called getting. spare, or double spare. The above is the strict game, as played in the bowling-saloous of the Broadway of New York; but in England sometimes it is played somewhat differently.

Powsprit, bo'-sprit, in Mar., a large boom or mast, which projects over the stein at an angle of about 36 degrees, for the purpose of carrying the sail forwa to govern the fore-part of a ship, and counteract the force of the after-sails, or those extended behind. bowsprit is otherwise of great use, as it is the principal support of the fore-mast, by contining the stays (or ropes stretching from the top of the mast to the bowsprit), by which it is secured and enabled to carry sail.

Bow-Window. (See Bay-Window.) Box, in Bot. (See Buxes.)

Box-Days, in the legal phraseology of Scotland, are wo days appointed by the judges of the Court of Se sion in each of the spring and autumn vacations, and one day in the Christmas recess, on which papers ordered by the court, or by the lords-ordinary, towards the close of the previous session, are usually appointed to be lodged.

BOX-HAULING, box-hawl-ing, in Mar., a particular method of veering a ship when the swell of the sea

renders tacking impracticable.

Boxing. (See Pugitism.)

BOXING-DAY, in England, is the day after Christmas, and is so called from the custom of giving Christmas boxes, or presents to servants and others, on that day.

BOXING THE COMPASS is a see phrase denoting the epetition of the several points of the mariner's compass

in their proper order.

BOYAE, BOYAE, or BOYAED, bo-yar' (Selavonic, a free possessor of land), was a general name applied to the class of noblity in Russia. They were originally distinguished warriors in the armies of the early conquerors of the country, and hence they received large grants of territory, and came to acquire great power. They were next in order to the railing princes of the

#### Boy-Bishop

Brachiopeda

stowed upon many of them about court, which, by degrees, withdrew them from their allegiance to the princes, and led to the overthrow of the latter. Peter the Great finally abolished the order of the boyars, by stripping them of their remaining privileges, and giving them a place among the Russian nobility. In Moldavia and Waikechia, boyars still erist, and have a soat and voice in the council of the prince.

Boy-Branor, bot bish op.—Anciently, on St. Nicholas's day, December 6, it was the custom for the choirboys in the cathedral churches to choose one of their number to maintain the state and authority of a bishop.

number to maintain the state and authority of a bishop. For this purpose he was habited in rich episcopal robes, had a mitre on his head and a crosier in his hand, and his fellows for the time being assumed the character and dress of priests, yielding him canonical obedience. They took possession of the church, and performed all the ecclesiastical ceremonies and offices except mass. The office and authority of the boy-bishop proclamation of Henry VIII., dated July 22, 1542, the show of the boy-bishop was abrogated; but, in the reign of Mary, it was revived, with other Romish ceremonials, to cease in the reign of Elizabeth.—Ref. Read's 2 purplus defaulties. Brand's Popular Antiquities, by Ellis.
Borsav, bicoi'-yo (fr. boyau, bowels).—The name

BOYSAV, bwoi'-yo (fr. boyau, bowels).—The name given in Mil. to any covered line of approach made owards the defensive works, during the siege of any place, by the attacking party. Boyeaux are termed parallel or zigzag, according to their direction with reference to the front of the work against which the

attack is directed.

BOXLE'S FUMING LIQUOR, boils, so called from having been invented by Robert Boyle, one of the fathers of chemistry in England. It is obtained by distilling one part of sulphur, two parts of chloride of aramonium, and two parts of lime. It is a mixture of several sulphides of ammonium and water. It is a

yellowish out liquid, with an intensely fethi odour. It is a very rarely used in medicine under the name of Liquor fumans Boylii.

BOYLE'S LECTURES, a course of eight annual lectures founded by the Hon. Robert Boylein a codicil annual to his will dated 1801. For the support of this lecture. to his will, dated 1691. For the support of this lecture he assigned the rent of his house in Crooked Lane to some learned divine within the bills of mortality, to be elected for a term not exceeding three years. The fund proving precarious, the salary was ill paid, and to remedy this, Archbishop Tennison procured a yearly stipend of £50 for ever, charged on a farm in the parish of Brill, Buckinghamshire, to be substituted. The design of the lectures, as expressed by the founder, is design of the lectures, as expressed by the connect, to prove the truth of the Christian religion against infidels, without descending to any controversies that may exist among Christians themselves. He is further to assist and encourage all companies in any undertaking for propagating the Christian religion. To this taking for propagating the Christian religion. To this foundation we are indebted for many elaborate defences of natural and revealed religion. A collection of these sermons, from 1692 to 1732, was published under the title of "A Defence of Natural and Revealed Religion, 3 vols. folio; and in 1737 an abridgment of many of the lectures was published by Gilbert Burnet, vicer of Coggeshall, in 4 vols. 8vo. Since number of the series have been published. Since that time a

BRIBARCIONES, OF BRABAROONS, brd'-ban-sawings, in the Middle Ages, were a kind of irregular soldiery of the Netherlands, who were infamous for rapine, being little better than commissioned banditt, and who hired themselves to fight for whoever would pay them best. Sometimes they were in the service of one prime or haron, and sometimes of another; but they often acted in an independent manner, setting govern often acted in an independent mainer, setting governments at defisione, infecting highways, pillaging the open country, and disturbing the public peace. They formed a kind of society or government among themselves, disregarding every other authority. The greatest monarchs were not ashumed, on occasion, to have recourse to their assistance; and as their manner.

whose fidelity he could repose any confidence. (See Hume's History of England, vol. i. chap. 9.) The name is variously written, but all the historians of the time derive it from the country of Brabant, which was the chief nursery of these troops.

BRABAROONNE, bra'-ban-son, the national song of the Belgians, which was sung during the rerolution of 1830. Its author was a young Fronch actor of the name of Jenneval, and it was act to music by Campenhout. Each verse ends with the refrain-

> " La mitraille a brisé l'orange Sur l'arbre de la liberté,

BRACE, or BRACE, brük'-se, the name given to trowsers, pantaloons, and other articles of armour and dress worn by the nations encircling the ancient Roman and Greek populations. The Latin word bruces corresponds with the Scotch word breeks, and the English word breeks. Trowsers, or bracem, were worn by

word breeches. the Medes and Persians, the Parthiaus, tite Phrygians, the Sacæ, the Sar-mate, the Dacians and Octa, Teutones, the the Belgæ, the Britons, and the Gauls. The Persian and Cossack trowsers of the preslightly very from those which were worn in ancient times. In ancient monuments the nations mentioned above are all



represented in trowsers, in order to distinguish them from Greeks and Romans. The illustration represents two Sarmatians, and is taken from Trajan's Column. Bracce were principally made of woollen materials, but they were sometimes made of silk and leather. They were sometimes striped, and cruamented with a woof of various colours. The aucient Greeks never wore them, but they were generally adopted by the Romans in the 2nd century of the Christian cra.

Brace, braises (Fr. embrases, to embrace, bind together), in Arch., a piece of timber placed in a slanting direction, and fastened at either end to the principal timbers of the roof of a house to add to their strength and stability. The brace was formerly used in typography to connect three lines of poetry forming

a triplet. Brace ( ), in Mus., is a double curved line, which is placed vertically at the beginning of the stave of any composition, and which is used to bind the harmonizing parts together, in order to guide the eye with greater facility from one set of staves to another. When more than two staves are joined together, either for part-singing or playing in concert, it is usual to draw a smaller brace within the large one, in order to distinguish each part. This union of braces is called a score,

BRACED .- In Her., when three chevronels are drawn

interlacing each other, they are said to be braced.

Brackler, braiss'-let (Lat. bracklum, an arm), an ornament generally worn encircling the wrist, but sometimes on the arm above the elbow. (See ABMLET.)

BRACHINUS. (See BOMBARDIER BEETLE.)

BRACHIOFODA, bra-ki-op'-o-dd (Gr. brackion, an arm, pous, a foot).—A term applied to certain molinecous animals having bivalve shells. They derive their name from the remarkable organs by which they procure their food. From the sides of the mouth project two have recourse to their assistance; and as their manner animals having broker shells. They derive their name of life gave them experience, hardshood, and courage from the remarkable organs by which they procure from the remarkable organs by which they procure from the remarkable organs of which they procure from the aides of the mouth project two bines. Henry II. of England enlisted numerous when not used for seigning the prey. These organs are not only used for obtaining food, but also in maintains affairs rendered even such banditti the only forces on

#### Preching

Brachium

The Brachiopola, or Pallio-branchiate, differ from the great majority of recent mollusks with hivalve shells, both internally and externally. The species now existing are very widely diffused, and are all marine; one of them, the Crania personata, has been brought up from a depth of more than 400 yards.

Brachium, brackishum (Gr. brachion, the arm), in Anat., is the name given to the arm, or that part of the upper extremity which extends from the shoulder to the wrist. The term brachial, hence, forms part of the name of certain portions of the arm, as the brachial muscle, the brachial artery. The brachial muscle, or brachialist internus, is situated on the fore part of the os humeri. It rises fleshy from the middle of the os humeri at each caide of the insertion of the deltoid muscle, covering the inferior and fore part of the bone, and is inserted the inferior and fore part of this bone, and is inserted by a strong short tendon into the coronoid process of the ulna. Its use is to bend the fore-arm. The branchief artery is a continuation of the axillary artery, which takes this name as it passes behind the tendon of the pectoralis major. It runs down the inner side of the arm, along the mner edge of the biceps muscle. of the arm, along the more edge of the breeps musers, behind the venn basilien, giving off several small branches in its course. Below the bend of the arm it divides into two branches,—the cubilalis and radialis.

BRACHESTOCHEORS, brain-kib-lo-krone (Gr. brachus, short; stoick-ton, a line), a term employed to

designate the curve described most rapidly, between two points in its course, by a falling body. The term was first used by John Bernoulli, professor of mathematics at Groningen, in 1696, who first drew the at-tention of philosophers to it. The curve is commonly called "the line or swiftest descent."

BEACKET, brak-et (Lat. brachium, an arm), a term applied to any projection, plain or ornamental, suspended against, or fastened to a wall, for the sup-



BRACKET.

port of a clock, statue, lamp, &c. The pieces of wood that are often used to support shelves are so called. The word bracket should not be taken as synonymous with "correl" (see CANTILEVER, CORBEL). as the latter, aithough serving a similar pur-pose, is invariably built into the wall, and not merely fastened to it. In

Mar., the knees which support the stern galieries of a ship are called brackets, and in gunnery, the expres-sion is used to denote the cheeks of the carriage of a

BEACKETS are marks used by printers for inclosing

words or sentences; thus. [ ]. BRACKLESHAM BEDS, brak-el-sham, in Geol., the lower tertiary sands and clays immediately overlying the London clay, so called from being well exposed at Bracklesham Bay, near Chichester. They contain the gigantic occidinm (which see), volutes, cowries, bones They contain the or names, crocodiles, and sea-scrpents.

BRACT, BEACTEA, or FLORAL LEAF, brikt (Gr. bracho, I crepitate), in Bot., a modified leaf from the axil of which a flower-bud arises. Strictly speaking, the term bract should only be applied to the leaf from which the primary floral axis, whether simple or branched, springs; while the leaves which are produced on the axis between the breet and the outer envelope of the flower should be distinguished as tractlets or bracteoles. In ordinary descriptions, however, the term bract is used to in-dicate either kind of floral leaf. Bracts are sometimes dicate either kind of floral leaf. Bracts are sometimes large, and similar to the ordinary leaves of the plants upon which they are placed, as in the white dead-nettle. Such bracts are termed leafy, and can only be distinguished from the true leaves by their position with regard to the flower-stalk or flower. In general, however the differ greatly from ordinary leaves. When the flower is sessile, the bracts are often applied closely to the cairs, and may thus be confounded with it.
Again, when bracts become coloured, they may be easily mistaken for parts of the corolla. In some instances they form part of the fruit, becoming incor-

#### Brahma

porated with other organs : thus, the cones of the porated with other organs: thus, the cones of the off and the strobili of the hop are composed of brand arranged spirally, and inclosing fertile flowers and the scales on the firnt of the pine-apple are of the same nature. When bracts grow in a whorl or origin from a single flower, as in the mallow, or a head of flowers as in the daisy, they are said to form an importance of as in the daisy, they are said to form an involume; and when a number grow together, as in the cup of the acorn, they then constitute a cupule. Though the brack is generally a small and inconspicuous organ; it cocasionally acquires a considerable size, and may actually surround all the flowers of a plant so as to completely inclose them when in a young state, as sheathing brack of this description is called a spates; it is very remarkable in the common arum. In the arrasses and sedges little brack called almass and values grasses and sedges little bracts called glumes and palso inclose the essential organs of reproduction. From the word bract several adjectives are formed; namely, bractiscent, assuming the appearance of a bract; bracti'l, furnished with bracts; bracticlate, having little bracts.

BRADFORD CLAY, brid'-ford, in Geol., a member of the Colitic system. It is a blue unctuous clay, occurring at Bradford, and extending for a few miles around that town. It is nowhere more than sixty feet in thickness, and is full of the fossils called Apicorinites.

Bradshaw's Rahway Guids, bride-skew, a well-known monthly periodical, projected by the late Mr. George Bradshaw, of Manchester, and which made its first appearance in December, 1841. It gives official information of the time of departure and arrival of the different trains on all the lines of railway in Great Britain and Ireland, with fares, &c.; also a general steam-packet directory, alphabetically arranged, giving the daily official sailings of all the steam-vessels during the gany omenat salings of all the steam-ressels during the month to and from every port in the United Kingdom; together with a travelling map of the railways of Great Britain and Ireland, and a variety of valuable and local information. The number for March, 1962, contains 237 pages of information on railways and steamboats, and about 60 pages of advertisements, and its sold for streams. The number of this wide heads is sold for sixpence. The success of this guide has induced others to enter upon the same field; but it still maintains its position as the cheapest and most useful of its class. Subsequently, Mr. Bradshaw attempted to do for the continental railways what he had already to do for the continental railways what he had already done for the British, and in 1817 issued the first number of his "Bradshaw's Continental Guide," a work which is still carried on. It attempts also, by giving much general and local information, to supply in some measure the place of a travelling guide for the Englishman on the continent.

BRADYPUS. (See Shoth.)
BRAG, brug (Welsh brugiaw, to brag), a game at cards, deriving its name from the efforts of the players to impose upon the judgment of their opponents by boasting of better eards than they possess. As many persons may play as the cards will supply, the desler giving to each player three cards uning up the last card all round. Three stakes also are put down by each player. The first stake is taken by the best card turned up in the dealing round. The peculiarity which gives the game its denomination occurs chiefly in winning the account table. Here, the breavest ning the second stake. Here the knaves and nines are culled "braggers," and all cards falling into the hands of the players assimilate to these. For example, one knave and two aces, two knaves and one ace, and two aces and one knave, all count three aces. The nines operate in the same way. The third stake is won by the person who first makes up the cards in his hand to thirty-one, with the privilege to draw, or not to draw, as he pleases, from the pack.

as no picases, from the pack.

Bragt, brai'.ji, in Scandinavian Myth., was the son of Odin and Frigga, and the god of cioquence and poetry. He was represented as an old man with a long flowing heard, like Odin; yet with a serene and unwrinkled brow. His wife was Idunna.

Bragna, bray, mg. is the name of the Supreme

BRAHMA, bra-ma, is the name of the Supreme Being in the religious system of the Hindoos. When the terminal vowel is short or elided, Brahma or Brahm, it denotes the essence of the Supreme Being apart from his personal existence. This is not an object of worship by the Hindoos, but only of devout contem-plation. Brahmā is regarded as the great source from which all things have sprung, and into which they will

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all ultimately be again absorbed. Brahmā, on the other hand, is an individual deity, regarded as the creator of the universe, and constituting, with Vishnu, the preserver, and Siva, the destroyer, the three prin-cipal gods of the Hindoos. Brahma does not seem to occupy now the high place that he once did in the Hindoe system. There are no exclusive worshippers f him, or temples dedicated to him alone; he only re-ives homage in conjunction with other deities. The incoo lavish their adoration upon those deities from nom they expect to derive some immediate advange-upon those who are engaged in preservation or struction. Brahms is usually represented with four sits and four hands, either reclining upon a lote-ee (the emblem of creation among the Hindoos) or ding upon a swan.

BRAUMINSM. (See Hindoolsm.)

BRAHMINISM. (See HINDOOISM.)
BRAHMINISM. (See HINDOOISM.)
BRAHMINISM. TIR, bra-mins, constitute the first or highest of the four castes into which the Hindoos are divided. They are the learned or sacerdotal class of the people. Anciently, all the learning of India centered in them; and many of the Greeian sages travelled thither to be instructed by them. The modern Brahmins, however, are sadly deteriorated from their early representatives; their learning is, in a great measure, confined to their sacred books, on which they write confined to their source with the most rile and licen-subtle disquisitions. Their conduct is characterized by falsehood, dishoncety, and the most rile and licen-tions practices; and yet they maintain a more exten-cive away over the people than the priests of any other mation. Their chief privileges consist in reading the mation. Voda, or sacred volume, in instituting sacrifices, in imparting religious instruction, and in exemption from

magneting rengious instruction, that in exemption from capital punishment. (See Histocorss.)

Brain, brain, is the name given to a soft pulpy substance, which in man and the higher orders of animals constitutes one of the great ceutral masses of the nervous system (which see). As was to be expected, data found in your in which was to refer the day of the found wast noticely daydown in your in whom its property days the found in the control of the found wast noticely daydown in the property days and the control of the control is is found most perfectly developed in man, in whom, with its membranes, vessels, and nerves, it constitutes the whole of the matter inclosed within the bones of the skull, and is, hence, termed the encephalon. In males, the average weight of the full-grown human brain is about 49 or 50 oz.; in females, 44. It varies, however, considerably in different individuals. In a series of 278 cases, the maximum weight of the adult male brain was found to be 65 oz., and the minimum 34; in 191 was 56, and the minimum weight of the adult female brain was 56, and the minimum 31 oz. The brain of the naturalist Cuvier is said to have weighed upwards of \$4 oz., and of that of the late Dr. Abercrombic, 63 oz. avoirdupois. Anatomists differ as to the size or weight of the brain at different periods of life. Soemmerring believed that the brain reached its full size as early as the third year; the Wenzels and Sir William Hamilton fixed the period about the seventh; and Tiedemann, between the seventh and eighth year. Gall and Spurzheim were of opinion that the brain continued to grow until the fortieth year. From a series of observations, however, "it appears that in general the weight of the brain increases rapidly up to the seventh year, then asone slowly to between sixteen and twenty, and then more slowly to between thirty-one and forty, at which time it reaches its maximum point. Beyond that period there appears a slow, but progressive, diminution in weight of about 1 oz. during each subsequent decennial period."—(Quain's Anatomy.) The only animals that possess absolutely a larger brain than man are the aleghant and whale. In the former, it is said to weigh between 8 and 10 lbs., and in the latter it was found. Saveres and to los, and in the latter it was jound, it a specimen 75 feet long, to weigh upwards of 5 lbs. Generally speaking, as compared to the weight of his body, the brain of man is leaver than that of the lower animals; but there are some slight exceptions to this

human brain to the body is greatest at birth, being about 1 to 5 85 in the male, and 1 to 6 5 in the female. At the tenth year, it is about 1 to 14; at the tentate. At the tenth year, it is about 1 to 14; at the twentieth, about 1 to 30; and after that age is averages about 1 to 30 5, with a trilling decrease in advanced his. In general, the size of the brain bears a certain relation to the mental powers of the individual, and a certain amount of it is please. amount of it is always necessary to sound mental action. The brain is divided by anatomists into the cerebrum, or brain proper; the cerebellum, or little brain; the pous Varolii, and the medulls oblongate. The cerebrum occupies the whole of the superior portion of the cavity of the cranium, or skull, and is by much the large portion of the brain, averaging, in the male, nearly 41, and in the female, about 383 oz. The crebellum occupies the lower and back part of the cranium, and is next in size to the cerebrum, weighing, in the male, about 5½, and in the femule, about 4½ oz. The pair Varolii and medulla oblonguta occupy the base of the brain, and together average about 1 oz. in weight, being rather larger in the female than in the male. The former occupies a central position on the under surface of the brain, and is connected with the cerebrum by two cords or peduncles, termed crara cerebri, with the cerebellum with two similar cords, termed crura cerebelli, and is also in contact with the medulis oblougata. This last is that portion of the encephalon which connects it with the spinal cord. It is of a pyramidal form, having its broad extremity turned upwards, and connected with the pons Varolii, while its under portion is united with the spinal cord. The brain is covered by three membranes, two of which, the outer and inner, are termed matres, from the old notion that they gave rise to the other membranes of the body. The outermost of these membranes, from being of firmer texture than the others, is termed the dura mater, and incloses the brain with its appendages, lining also the whole internal surface of the cranium. Its outer surface, which adheres to the bones of the cranium, as the periosteum does to the other bones, appears to be rather rough and irregular; but the inner surface is smooth and shining, and is lubricated by a fluid which is secreted by it. This membrane is the densest and strongest of the whole body, its component fibres interlacing each other in all directions. It sends off several folds or processes, which descend between certain portions of the brain. The principal of these is the superior longitudinal process, or falx cerebri, as fibres interlacing each other in all directions. it is termed, from its supposed resemblance to a sickle or seythe, which extends from the fore to the back part of the skull, and descending into the substance of the brain, divides it into two portions, called the right and left hemispheres. Where it terminates behind, there is a arge lateral expansion of the same membrane, exceeding across the back part of the skull, and separating the cerebrum from the belium : it is called the tentorium cerebelli. From the middle of the tentorium another membranous expansion takes its rise, and descending downwards between the lobes of the cerebellum, terminates at the edge of the foramen magnum, or great occipital hole. It is termed the fulx cerebelli. The second, or middle, of the three membranes, is an extremely thin and delicate substance, and from its fancied resemblance to a spider's web, it receives the name of arachnoid. It is transparent and colourless, and is spread uniformly over the surface of the brain. The third investing membrane, the pia muter, is also very delicate and tender, but differs from the aracknoid in its abounding in blood-vessels, whereas no blood-vessels have yet been discovered in the latter. The blood-vessels with which subtracts of the latter. with which every part of this delicate membrane is covered are the nutrient arteries of the brain. They subdivide and ramify to an extreme degree upon the surface of this membrane, so that the blood may enter the substance of the brain only in very minute quantities. As the pia mater contains and supports the nutrient vessels of the brain, it is not only, like the others, spread over its entire surface, but it also penetrates between all its convolutions, and lines every cavity which it contains. The nervous matter of the brain is composed of two distinct substances, differing from each other both in colour and consistence rule, as in the case of certain species of small birds and One of these is the grey or eineritions subdance, termed in the smaller apen. The proportionate weight of the also, where it forms the enter covering, as in the cerebrum and cerebellum, the certical substance, from its surrounding the inner part like the bark of a tree. The cineritious substance is of a softer consistence than the other, and is composed almost entirely of blood-reasels. connected and sustained by exceedingly fine cellular membrane. It forms an outer covering to the entire surface of the cerebrum of generally about one-tenth of an inch in thickness. The white of medulary sub-stance, which constitutes the internal portion of the scarce, which constitutes the merina portion of the cerebrum and cereblum, is of firmer consistence, and is sumposed of microscopic fibres arranged into laminas and bundles, between which intervening vessels ramify. In the carebrum these fibres run in general, in such a direction as to converge towards the base of the brain. The cerebrum is of an ovoid shape, but ir-regularly flattened on its under side. It is divided into two lateral halves, termed hemispheres, separated from each other through a great portion of their extent by the great longitudinal fissure, into which is inserted the falx cerebri. This fissure, both before and behind passes quite through to the base of the cerebrum; but in the middle it is interrupted by a transverse portion of white substance termed the corpus callonum, which connects together the two hemispheres. Each hemisphere is subdivided into an anterior, middle, and posterior lobe, but it is only on the under surface of brain that these lobes are properly marked off. The anterior and middle lobes are separated from each other by a deep tissure, named the fissure sylvia, which extends obliquely backwards to a considerable depth. The middle and posterior lobes are not so distinctly marked off; but anatomists regard as the posterior lobe that portion of the cerebrum which lies over the cerebellum. The surface of the cerebral bemispheres is not plain and uniform, but presents numerous tortu-ous eminences, named convolutions or gyri, which are separated from each other by deep grooves or furrows, termed sulci. These are generally about an inch in depth, but they vary considerably in different brains, and even in different parts of the same brain; and, indeed, those of one side frequently differ from those of the other. The convolutions are more marked as the brain is hetter developed, and are more numerous and manifest in man than in the lower animals. As the cortical substance of the brain is continuous over the whole surface of the hemispheres, in the fissures as well as upon the convolutions, it follows that the greater the number and depth of these, the greater is the superficial extent of the grey matter which is generally regarded as the seat of all the nervous manifestations, as sensa tion, volition, &c. On slicing away the substance of the hemispheres to a level with the corpus callosum, it will be seen to be formed by the converging fibres of the two hemispheres, whence it has been termed the commissuru magua, or the great commissure of the brain. Under the corpus callosum are the two great cavities termed the lateral centricles, distinguished into right and left. They are very irregular in shape, and are described as each consisting of a body and three horus, or cornua, -the anterior, posterior, and middle. are separated from each other by the septum lucidum which descends from the lower surface of the corpus callosun, and consists of two lamine, between which is the very small cavity of the septum lucidum. It rest apon the fornir, a triangular medullary body, having its apez directel forwards and its base backwards. Posteriorly it is connected with the corpus callosum, and it divides laterally into a posterior cornu on each side, which terminates in, or rather is continuous with the tanta hippecampi, and the hippocampus major and minor. The eides of the fornix slightly overlap the optic thalami, while its inferior surface covers the third ventricle, from which it is partly separated by the velum interpositum. The third ventricle is a small narrow cavity lying between the optic thulami. These last are two large firm oblong bodies nearly an inch and a half long by three-fourths of an inch wide and deep. Anteriorly the optic thalami are continuous with the corpora strinta, and posteriorly they are conmeeted by small peduncies with the Pineal gland, and with the nutes. The corpora striata are two grey pearwith the nutes. The corpora striats are two grey pear-shaped bodies, but internally they are streaked with white matter,—whence their name. In front they are obtuse, and approach each other; but they separate and narrow as they proceed backwards. The Pinsal

gland is a small portion of grey matter about this of a small pea. It was supposed by Descartes a the seat of the soul. The corpora quadrigenties four small white round bodies intimately connec with each other, of which the anterior and super-minance and the matter of the statement of the stat pair are called the nares, the posterior and inferior beamed the testes. The anterior commissure is a named the rests. The anterior commissions as as dullary band uniting the corpora striats, the mic commissure is composed of grey matter, and com-together the two optic thalami, as does also posterio the posterior commissure, which is a rounded white cord. The crura cerebriare two short, thick, rounded cords connecting the optic thalami with the pone cords connecting the optic thalams wish the pone va-robi: They are composed principally of medullary-matter, but in their interior is a semilunar mass of dark grey matter. The cerebellum, or little brain, orm-sists of a body and three pairs of crura or pedunclies, by which it is connected with the rest of the encoplation; and it is not covered with convolutions like the cerebrum, but appears to be formed of a number of lamelle or plates, with sulci between them. When cut across the grey and white matter are seen to be arranged some what in the form of a tree, the white substance forming the stalks, and the grey the leaves; and hence it has been termed arbor vita. The two peduncies of the cereballium connect it with the testes of the cerebrum, and are known as the processus e cerebello ad testes; the infe peduncies—processus e cerebello ad meduliam—pass downwards to the back part of the medulis oblongata, and correspond with the restiform bodies; the middle two are the crura cerebelli, which pass from the middle of the cerebellum, round the outer side of the crura cerebri, and meet in front in the pons Varolii, consti tuting its transverse fibres. The space between the cerebellum behind and the medulis oblongate in front is named the fourth ventricle of the brain, or the ven-tricle of the cerebellum. The pons Varolii, or annular protuberance, is a comparatively small portion of the brain, and occupies a central position on its under surface, above and in front of the medulla oblongata; with which it is continuous. It consists of transverse and longitudinal white fibres, interspersed with a quantity of diffused grey matter. The transverse fibres, quantity of disused grey matter. In transverse sures, with few exceptions, communicate with the cerebellum by means of the middle crura; while the longitudinal fibres are those which ascend from the medulas oblingate into the crura cerebri. The medulas oblongate is that part of the encephalon which is immediately connected with the upper end of the spinal cord, and has an inclination obliquely downwards and backwards has an inclustion obliquely downwards and backwards towards the foramen magnum. It is pyramidal in forms, tapering towards its connection with the spinal cord. It is marked longitudinally by an anterior and posterior fasure, which are continuous with those of the spinal cord, and by which it is partially divided, like the cord, into two lateral and symmetrical haives. On the upper part, however, a new arrangement takes place; for, on each side of the median line, the lateral fissures disappear, and the surface of each half of the medulia presents four eminences or reducing which, commencing presents four eminences or columns, which, commencing at the anterior fissure, and proceeding backwards each way to the posterior fissure, are met with in the following order,—the anterior pyramids, the obvary bodies, the restiform bodies, and the posterior pyramids. From the under-part of the brain issue a mids. From the under part of the brand pass number of nerves, known as the cranial, and pass the base of the skull. They are The following is the proportions of the different sab-stances that compose the grey and white matter of the hrain ---

	ALS V	44 217-00
Water	85.3	73.0
Albuminous matter		9.9
Colourless fut		13.0
Red fat		09
Osmazome and lactates	1.4	1.0
Phosphates		1.3
-	-	-
	100.0	100.0

On the functions of the brain and its several parts, some notice will be taken in treating of the subject Phren-ology (which see). In comparing the brain of man ology (which see). In comparing the brain of man with that of the other mammalin, the most obvious distinction is its much greater size in proportion

## Brein

to the size of the body. In the dog the brain bears an average proportion to the body of about 1 to 120; in the boxes, 1 to 500; in the sheep, 1 to 730; and in the tox, 1 to 300. The convolitions, too, which are so marked on the human brain, are few, or altogether wanting, on the brains of animals. In particular, in animals, the medullary matter of the brain predominates in every part, while the cinertious is deficient. The nervee of sense, too, in animals are usually much more largely developed than in man. In man the olisatory nerve is not one-fourth of the size of that of olfactory nerve is not one-fourth of the size of that of the berse, though the brain is so much larger. In the smaller quadrupeds the comparative size of the brain approaches nearer to that of the human, being in the mouse about a forty-third part of the weight of the animal; but it is composed almost entirely of medullary matter. In birds, the brain is in general a much less complex organ than in mammals, presenting no convoson its surface, and having only a very small quanthe form of the surface, and naving only a very small quantity of cineritious matter. Though its bulk is in general proportionally much smaller than the human brain, yet in some of the smaller birds, as the challinch and the redbreast, it approaches that of the latter. In fishes the brain is yet more diminished; in the chub being only 1 to 842, and in the lamprey 1 to 1.425. It conresists merely of two pairs of ganglia and a single one. The two anterior ganglia or lobes are the offactory lobes, immediately behind which are two others, generally of larger size, called the optic lobes; while behind these is a single ganglion, or lobe, situated in the median line, and termed the cerebellum. Ref. Quain's Anatomy; Carpenter's Human and Comparative Physiology; Solly On the Brain; Todd On the Brain and Merrees; Huschke, Schaedel, Hirn, und Seele des Menschen, and der Thiere, nuch Aller, Geschlecht und Reg. 1884.

Race, Jona, 1854.

BRAIN, DISEASES OF THE.—The brain, which is the most delicate and exquisitely-formed of all the organs notes denote and exquisitely-formed of all the organis-of the human body, is subject to a great variety of dis-orders, most of which will be treated of under their proper heads in other parts of this work, but some of which it will be necessary to notice here. Inflammation is one of the most common diseases to which the brain is subject, and may result from a number of causes, from external injuries, as blows or falls, the symptoms of which may not manifest themselves for many days; from the improper use of narcotics or stimulants, exposure to the cold or the action of the sun's rays, protracted study, excessive joy, or other mental emo-tion; as well as less directly from diseases of the digestive or other organs of the body. It is character-ized by more or less violent pain of the head, with suffusion or prominence of the eyes, the countenance generally tunid or flushed, and delirium or stupor. In the treatment of this disease, general and local bleeding are usually had recourse to; the latter by means of leeches applied about the head, or by cupping. The head is also usually shared, and kept cool by rags wet with cold or iced water. Frequently, in children, inflammation leads to a form of disease known as water in the head, or hydrocephalus (which see). Softening of the brain is caused by the want of a proper supply of nourishment to the cerebral substance, and may arise from various causes. It is characterized by lowmass of spirits, headaches, giddiness, the loss of memory, and at length imbectility and paralysis. Unfortunately, this is a disease which little can be done to remedy, especially when it results from a disordered state of the nutritiont organs themselves, as from disease or obstruction in the arteries which convey the blood to the corebral substance. Frequently it is occasioned by over-anxiety or excessive study; in which case every-thing is to be done to get rid of the predisposing cause. thing is to be done to get rid of the predisposing cause. Every thought, every mental effort, destroys a certain portion of the cerebral matter; and hence, if destruction takes place more rapidly than renewal, a wasting or rottening of the brain is the result. The blood-result, particularly in the aged, are also liable to be raptared. (See APOPLEXY, CONVULSIONS, INSANITY, DELIRATE TRANSMERS, PARLYSIN.)
BRANK OF BRANK, Draik, in Mach., a block of wood

#### Branding

reliway-carriage in which is pluced the brake intended to retard or stop the train when needed. Brakes are sometimes used in the form of bands of metal or leather passing round a wheel, by the tightening of which the necessary amount of friction is produced.

BRANE, OF BRACKEN. (See PERRIS.)
BRANAH LOCK. (See LOCK.)
BRANAH PERSS. (See HYDROSTATIO

(See HYDROSTATIC PRESS.)

Braman Perss. (See Hydrostatic Perss.)
Brambur. (See Rubus.)
Bramburs, brambi-ling (Fringilla montifringilla), also called mountain-fluch. This bird is rather larger than the chaffluch. The tail is forked, and its prevailing colour black, white, and yellow.
Bran, bran, the skins or husks of corn, especially of wheat ground, separated from the corn by a sieve, or boutted. Large quantities of wheat bran are used for making starch. The dyers reckon bran among the monocolouring drugs, and use it for making starch. non-colouring drugs, and use it for making the sour waters with which they prepare their dyes. Bran is

also used as food for horses and cattle.

BRANCH, bransh (Fr. brunche), in Bot., that part of a plant which is produced from a lateral leaf-bud on the primary axis or stem. It is looked upon as part of the stem, and not as a distinct organ. A branch generally produces secondary branches, and these give rise to minor ramifications, called branchlets or twigs. The different modes in which branches spring from the stem give rise to the various forms of trees; such as pyramidal, spreading, and weeping. Thus, in the Italian poplar and eypress, the branches are erect, forming coute angles with the upper part of the siem; in the oak and cedar they are spreading, each forming nearly a right angle; in the weeping ash and elm the angles are oblique; while in the weeping willow and birch the branches are pendulous, from their flexibility. The comparative length of the upper and under branches also gives rise to great differences in the contour of trees, as seen in the conical form of the spruce, and in the umbreha-like shape of the Italian pine. (See STEM.)

BRANCHIE. (See GILLS.) BRANCHIOPODA, bran-ki-op'-o-da (Gr. branchia, gilla, pour, a foot), an ord of small crustacea, belonging to the division Entomostraca, which usually abound in still fresh waters. These animals have thin mouths, furnished with jaws fitted to masticate their food; and their name is derived from the peculiarity which they possess in having the branchia or gills, which are numerous, attached to the feet. They swim freely; but their feet are not generally adapted for locomotion. The antenne, in some cases, serve as organs of motion. While swimming, they keep their reet constantly moving, and thus prevent the water from becoming stagnant.

BRANDENBURG, CONFESSION OF, bran'-den-boorg, in Eccl. Hist., is the name given to a formulary or confession of faith, from the city of Brandenburg, where it was drawn up by order of the elector, with a view to reconcile the differences in the tenets of Luther and Calvin, and to put an end to the disputes occasioned by the Confession of Augsburg. (See Augsburg, Confession SION OF.)

Buandeum, bran'-de-um, a term used in the Middle Ages to signify the silk or linen in which the bodies of the saints, or their relies, were laid. The name was also applied to linen clothes which had been laid on the bodies, and were thus believed to be endowed with great virtues.

BRANDING, brand'-ing (Ang.-Sax.), a mode of punishment formerly inflicted in England for various offences. It was done by means of a hot iron applied to the face or hand. Formerly, all who were admitted to benefit of clergy were burnt with a hot iron in the brawn of the left thumb. The punishment of burning on the hand, however, being found to be ineffectual, it. was charged, by 10 & 11 Will, LLI, c. 23, into burning in the most visible part of the left cheek nearest the nose; but this mode was repealed by 5 Anne, c. 6. 11, how-ever, continued the burning in the hand; and this last was not entirely abolished until 1822, by 3 Geo. IV. c.38. The branding still in force for desertion from the BRAINS, FABLUSHAJ.

BRAINS, or BREAR, bresk, in Mach., a block of wood army is not done by a hot iron, but with ink, gouponspilled by lever or sorew pressure to the circumference of a wheel, to alsoken or arrest the moving power of not liable to be obliterated. The mark is the letter D, a machine, by the production of a large amount of not less than an inch in length, and is marked on the friction. By extension of meaning, it now signifies the left side two inches below the armyti.

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# Brandon

Brancon, bron'- don (Gor. brond, fire), a name sometimes given to the first Sunday in Lent, from the conston, which at one time is said, to have prevailed in many places, of the peasants passing through their orchards and vineyards on that day with lighted conches, and threatening to cut down and burn the trees if they did not bear fruit in the coming year

out not near truit in the coming year.

BERNEY, brdn'de, a spirituous liquor, separated from wine by distillation. The word is derived from brantwein, a German word signifying burnt wire. It is prepared from wine in most wine-growing countries; but France, and, most notably, the town of Cognac, in the Charente, has always been considered the great brandy-producing locality. Cognac brandy is esteemed from the absence of a certain flery flavour found in other brandies, which is caused by a parameter. found in other brandies, which is caused by a very small quantity of an acrid oil contained in the skin of the grape. Brandy, when newly distilled, is as clear the grape. Brandy, when newly distilled, is as clear and as colourless as water; but, on being put into oak casks, it acquires a yellowish-brown colour, from dis-solving a portion of the tannin contained in the wood. This colour is generally simulated in inferior kinds by the addition of a small quantity of caramel, or burnt sugar. British brandy, which has been the subject of numerous patents, is an attempt to produce, by factitions means, a spirituous liquor bearing a close resem-blance to foreign brandy. The best malt spirit is blance to foreign brandy. The best mult spirit is flavoured and coloured by various substances, ranging from French plums to oak shavings, each manufacturer liaving his favourite recipe. The quantity of brandy made in France is about 29,000,000 gallons, of which about 3,000,000 gallons are imported by England. Chemically speaking, brandy consists of spirit of wine coloured by tannin or burnt sugar, and flavoured by a small quantity of volatile oil that passes over during distillation.

Branks, brinks, an instrument formerly adopted for the punishment of scolds in England and Scotland. Dr. Plott, in his "History of Staffordshire," says, that it so effectually and safely corrects

scoids, "that I look upon it as much to be preferred to the cucking-stoole, which not only endangers the health of the party, but also gives the tongue liberty twixt every dipp, to neither of which this is at all liable: it being such a bridle for the tongue as not only quite deprives them of speech, but brings shame for the transgression and humility thereupon before it is taken off: which being put upon the offender by



BRAMES.

prames. order of the magistrate, and fas-tened with a padlock behind, she is led round the town by an officer, to her shame; nor is it taken off till after the party begins to show all external signs imaginable of humiliation and amendment." It was of various forms, the party begins to show an external agent magnetosome, humilation and amendment." It was of various forms, but was usually composed of several hoops of iron, one or more of which passed over the head, and one round by the mouth, into which was inserted a plate of iron so as to press upon the tongue. The whole closed behind by hinger, and was secured by a padlock.

Brasenose College, braize - nose, the name of

one of the colleges of Oxford, founded in 1509, by the joint benefaction of William Smith, bishop of Lincoln, and Sir Richard Sutton, of Prestbury, in Cheshire. It was originally established for a principal and twelve fel-lows, natives of the old diocess of Lichfield and Coventry, fulling whom natives of the diocese of Lincoln; and if mone of these be eligible, then the most fit and learned that can be found in the university of Oxford. Eight fellowships were afterwards added, by various benefactors, between 1522 and 1598, subject to various restrictions; but, by an ordinance of the commissioners, under 17 & 18 Vict. c. 81, fire of the fellowships were suppressed, and the rest thrown open. The scholarships and architecture of this college. ships and exhibitions of this college are numerous. Some of the open scholarships are of the value of at least £30 per annum, and are tenable for five years. The Hulms exhibitions, fifteen in number, to which undergraduates of three years' standing are capable of being nominated, are each Worth £120 per annum, besides £35 to be spent in books, to be selected by the principal.

# Brazzes, Monumental

BRASS. (See RUBBLE, Brass, brds (Sax, bras), a compound metal or Brass, bride (Sax, eres), a compound messe or assectationing sine and copper in varying propositions, according to the surpose for which it is to be used; the general composition is, however, two-thirds copper and one-third zine. The use of brass is very ancient, the Romans having been accustomed to make it and at the name of es. Brass was formerly made by the following process:-Copper was first cast in shot-like us process:—Copper was most cast in snot-use managers alled shot copper, by pouring the indiced metal late water. Forty-fire parts of this were mixed with sixty parts of powdered esismine (carbonate of zinc), and a quantity of charcoal powder was added to the whole. The mixture was then placed in crucibles, and subjected to the heat of a furnace for seven or eight hours, and the resulting metal was cast in grante moulds Brass is now generally made by the direct union of its component metals. Brass is of a fine yellow colour, susceptible of a high polish. It is malleable and ductibe when cold, and is more fusible and harder than copper. Great difference appears to exist amongst metallurgists as to the best proportion of copper and zine; and the analyses of specimens of brass of known quality give very different results, varying from 63 to 91 per cent. of copper to 17 to 9 per cent. of sinc, mixed with T or 2 per cent. of tin or lead. The uses of brass in the arts are very numerous. The facility with which it may be cast, or worked in the latte renders it particu-larly valuable for the manufacture of philosophical instruments. Brass wire is used exclusively for pins. Latten is sheet brass, and Dutch metal is brass beaten into thin leaves. Birmingham is the chief seat of the

brass manufacture in England. BRASSARTS, bras'-sarts (Fr. bras, the arm), pieces of defensive armour which pro-tected the arm from the shoulder

to the elbow : when the front part, or outside only, of the arm was protected, the single piece that covered it was called a demi-brassart. Brassarts are sometimes called rere-braces, or arrière-bras. The brassart was worn by the Persians. In Europe, during the Middle Ages, its use, like the other parts of a suit of mail, was general. The term brassart was also applied by the people of that period to any ornament or badge worn upon the arm.



BRASSES, MONUMENTAL, brus'-ees, plates of brass of different forms, but for the most part consisting of representations of the human figure, or highly-ornsmented crosses, let into slabs of stone or marble to serve as sepulchral records of the dead. The slab on which the brass was placed, forming, in some cases, part of the pavement of the church or chapel, and in others, the upper part of an altar-tomb, or the back of the recess in which the altar-tomb itself was sometimes placed under a richly-carved canopy of stone, was carefully hollowed in accordance with the outline of the brass with which it was to be inlaid, to admit of the insertion of the metal sufficiently deep to bring its upper surface on a level with that of the slab. The brass was then hedded in pitch, and fastened to the stone with rivets. The forms in which the monumental brasses were designed were various, and differed greatly in point of decoration and elaborate execution. The figure of the person commemorated by the monument was generally placed in the centre of the slab, the features, armour, folds of the dress, &c., being marked by lines deeply cut into the metal, and filled with some black substance; sometimes a canopy supported by pillars surrounded the figure, adorned with armorial hearings, which were occasionally shown in their proper colours, the metal being out away, and the field or charges being filled with coloured enamels, a white metal being inserted to represent argest. Inscriptions were added, either on labels of brass let into the stone were added, either on tables of brass let min the stone outside the canopy, or on that part of the brass imme-diately below the feet of the figure. These brasses were often gilt or highly poisshed, and when first put down they must have presented a beautiful appearance, the burnished metal contrasting with the stone in which it was inlaid, which was generally of grey marble, or

# Braces, Monumental

sions of a dark colour. On the continent the whole surface of the stone is overed with a plate of brees, and the figures are shown in outline on it, and in this respect the continental braness differ from those found in this country. The most beautiful to be found abroad are in the churches of Belgium and the north of France, formerly known as Fanders, from which country the art is approsed to have been introduced into England by Flomes, artists subsequently to the Normau con-cusset. The oldest brasses known at present in this of rights are seen superquently of the resent in this country are those of Sir John d'Abernoun, at Stoke d'Abernoun, 1377; Sir Roger de Trumpington, at Trumpington, 1377; Sir Roger de Trumpington, at Trumpington, 1377; Sir Roger de Trumpington, 1378; Richard de ington, near Cambridge, 1289; and Sir Richard de Buslingthorpe, at Buslingthorpe, Lincolnshire, 1290. This form of sepulchral memorial was much in vogue until the chose of the 16th century, particularly in the essiern counties; but after this time brasses were less frequently used, falling into disrepute with the magnificent Gothic architecture of the mediaval period, and sysing place, after the 17th century, to the unmeaning mural tablets that disfigure the walls of so many of our churches and cathedrals. Of the thousands of brasses that formerly existed in England little more than two thousand now remain; many were ripped from the slabs to which they were fastened, and destroyed at the suppression of the monasteries by Henry VIII., and many more during the civil war, when the Puritan soldiers of the parliament wantonly destroyed numberless ecclesiastical memorials of bygone times. To show the wholesale manuer in which these valuable monumental records have been made savey with, it is stated in Paley's "Manual of Gothic Architecture," that of the one hundred and twenty brasses that adorned the pavement of York Minster in 1612, only one now remains. In monumental brasses the figure is generally represented in a reclining position, with the hands on the breast as if in practice. the head on a pillow or cushion, and the fect on the figure of an animal, a dog being generally represented at the feet of a lady, and a lion at those of presented at the feet of a lady, and a lion at those of a nobleman or knight. Great attention is always paid to the various details of costume, and, for this reason, these brasses present features of peculiar value to the archamologist and historian, and are invaluable in showing the style of dress and the form of armour and sacwing the style of dress and the form of armour and weapons used at various periods of the medieval his-tory of England. The inscriptions are generally in black letter, or letters of Gothic character, peculiar to the period in which the brass was cut: they are for the most part in Latin or Norman-French. With the revival of Gothic architecture, which is now rapidly supplanting the classic style of building introduced by Christopher Wren, and followed by architects of a subsequent period, the use of bresses as semulchral records has again been introduced, and several me-morials in this form have been lately laid down both in England and on the continent. The following is the process used in taking facsimiles of brasses, or rubbings, as they are called:—White paper, tolerably thick and soft, which is made for the purpose, or cartridge-paper, is laid upon the brass, and rubbed over with heelball. a composition of beeswar, tallow, and lampblack. The incisions in the brass appear in white relief on a black ground, the heelball covering the paper with a dark coating in every part, except where the hollows in the brass offer no resistance to the rubber. Sometimes a paper of a dark colour is used, and the rubbing taken with an adhesive composition coloured with a yellow powder: and, by these means, a far better representation of imparts a metallic appearance to the paper, excepting where the incisions appear, which, from the dark colour of the paper used, resemble in colour, as well as form, sions in the brass itself. The following plan is the in the messions in the orass used. Instituting past in constitute adopted to obtain a durable facsimile, although the process is attended with considerable frombie. The rubbing is pasted on a thin well-seasoned deal board, which has previously been pointed in flat-taned colour to resemble brass as closely as possible. taned colour to resonable brase as closely as possible, and brought to a very smooth surface. The white parties in the paper, corresponding to the incisions in the brase, are then cereduly and away with a graving-tool, and some of the wood below taken out with them. Hollows are then obtained corresponding to those in the brase, which, after the paper remaining on the 239.

## Brawling

board has been damped and removed, are filled with black, or, in the case of armorial bearings conturing in the brase, coloured composition. The scatlest collection of impressions from monumental brases was made by Sir John Cullum, the Rev. T. Cole, and Mr. Craven Crd. It was purchased by Sir Francis Doues, and given by him to the Britiah Museum, where it may now be seen in the print-room.—Ref. Paley's Massact of Gothic Architecture; Waller's Series of Monumental Brases from Edward I. to Elizabeth; Boutell's Monumental Brases of Expland; Oxford Manual of Brases; English Cyclopædia—Arts and Sciences.

English Cyclopædia—Arts and Sciences.

Of the cabbage), in Bot., a gen. of plants belonging to the nat. ord. Crucijers, and containing several species, which are commonly cultivated as food for man and cattle. B. rapa is the common turain.

Brassea, brus-si-k (from bresie, the Celtic name of the cabbage), in Bot, a gen. of plants belonging to the nat. ord. Crucises, and containing several species, which are commonly cultivated as food for man and cattle. B. rapa is the common turnip. The species B. campestris is regarded by some as the source of the Swedish turnip; but others consider this vegetable to be a hybrid between B. campestris and B. rapa, or napas. The species B. plaracea is supposed to be the common origin of all the different kinds of cabbage, cauliflower, brocol, and kohl-rabi, the different varieties having been produced by the art of the gardener. Brocoli and cauliflowers are deformed inflorescences; the kohl-rabi is produced by the stem enlarging above the ground into a fleshy knob, resembling a turnip. On comparing the original plant, as found on our shores, with wavy green leaves, no appearance of head, and flowering like wild mustard or charlock, say with the red cabbage or the cauliflower, the difference is astonishing. B. napus yields the rape, code, or colza seeds, from which a large quantity of bland fixed oil, much used for burning and other purposes, is expressed. The cake left after the expression of the oil constitutes the well-known oil-cake used for feeding cattle. The seeds of B. chinemis yield Shanghai oil.

BRATTICE, bratt-tis, a wooden wall or partition made in the shaft of a mine to prevent the eacape of gas or water, or to assist in the ventilation, by creating an unward surpers of hir.

BEAUNITE, brown'-ite, a protoxide of manganese, occurring in Piedmont and Touringia, in dark-brown square octahedrons. It contains 79 per cent. of man-

Bravi, bru'-vi (Ital. bravo, brave), is a name given in Italy to a certain class of individuals who engage themselves for money to perform the most hazardous enterprises, frequently murder.

Bravo! bra'-vo, a term of exclamation, adopted

Brave! bra'-ro, a term of exclamation, adopted from the Italian, avois gnifying excellent, or well done, It is used in English without regard to gender or number, but the Italians use brave for the feminine, and brave for the plural. The superlative is bravissime.

brant for the plural. The superlative is bravissimo. BRAVUMA, bra-voo'-ra(1tal.), in Mus., a term generally applied to a song of considerable spirit and execution; but sometimes it is also applied to the performance of such a song.

Brawling, brand'-ing (Fr. brailler; Belg, brailen, to roar), in Law, is the offence of quarrelling, chiding, to roar), in Law, is the offence of quarrelling, chiding, or unduly, indecorously, or irreverently speaking in a church (including the vestry) or in the churchyard. The sanctity of places dedicated to the solemn offices of public worship has always been protected from violation, and from time immemorial, the courts Christian established in this country have been permitted to take cognizance, not only of actual breaches of the peace, but of the use of violent or abusive words, tending to induce persons to commit a breach of it. There was a time when disturbances in the church were of frequent occurrence, and sometimes carried to great extremities. In the early ages of the Reformation, disturbances were too apt to arise between the statute 5 & 6 Edw. VI. c. 4, was passed, by which it statute 5 & 6 Edw. VI. c. 4, was passed, by which it statute 5 & 6 Edw. VI. c. 4, was passed, by which it shall be lawful for the ordinary of the place where the same shall be done, and proved by two lawful witnesses, to suspend any payson so offending, if he be a clerk, from the entraces of the cliurch, and if he be a clerk, from the ministration of his office, for so long as the said ordinary shall think meet, according to the actual. This act did not greate the offices, sat is sub-

sinced by the occurren law before the statute was masted. A pury, therefore, may proceed either upon the statute or upon the statute the ... In the latter stant, one witness is sufficient to prove the fact. With regard to what may constitute the offence, there is a discretion in the court which would induce it to consider time and place. That might be childing and therefore in a thurth which might not be so in the vestry. The latter is a place for purish business, and the court would not interpose further than might be necessary to preserve order and decorum. Therefore, it has been held, that in a vestry meeting for civil purposes, is a full latitude of discussion must be allowed, more coarse expressions do not constitute the searling. But even there parties must not present manner. But even there parties must not present the only interesting species is H. authelminica, a native of Abysninia, the Howers of which constitute the drug known as Koussoo, which has lately been cur-

drug known as Koussoo, which has lately been em-ployed in both France and England with considerable success for expelling tapeworm. The flowers are apetsious and diosolous, and are imported in a dried state. The mode of administering the Koussoo is peculiar. About half an ounce is infused in a glass of warm water, and taken thus, flowers and water together, on an empty stomach. The flowers contain a considerable quantity of tannia, and an odorous principle to which the anthelmintle property is probably owing.

BRAZIL NUT. (See BERTHOLLETIA.) BRAZIL NOT. (See BERNOLLETIA.)
BRAZILETO WOODS. (See CESALFINIA.)
BRAZING, braize-ing, the soldering or joining two
phoes of iron together by mens of thin plates of brase
melted between the pieces that are to be united.
BREACH, brech (Fr. breche; SRI. brecan, Ger. bre-

shen, to break), in Mil., a term used to denote an open-ing made in any part of the rampart of a citadel or forby a continuous cannonade directed against that particular part by the besieging force, in order to obtain an entrance over the ruins and debris of the shattered wall. As soon as the breach is effected, and the stones as well as the rubbish and earth behind the wall are brought by the firing into the form of a rough inclined plane, a storming party is told off, and the works are carried by assault. To effect a breach, the breachingbattery is brought as close to the walls as circumstance will samit, that the fire may be directed in a line almost perpendicular to the face of the rampart. Sometimes the desired purpose is attained by mining. The attack and defence of a breach is obstinately conducted on both sides, and is always attended with considerable bloodshed and loss of life. At the siege of St. Schattan, during the Peninsular war, about 100 feet of the curtain between two bastions was brought down after a fire kept up for nearly seven weeks, during which 13,000 shots were fired; it was then taken by storm, the assaulting column being under the com-mand of General Graham, afterwards Lord Lynedoch, August 31st, 1813. The French gave the storming-column a warm reception, having defended the break with strong cheraux.de-frise, consisting of sword-blades and hayoners fastened to beams of wood, and shells, and powder-barrels, which were fired by means of a train communicating with them, while the rugged slope was strewn with planks and pieces of wood, studded with spikes and nails and sharpened iron. Under the system introduced by General Toditeben at the siege of Sohastopol, of constructing earthworks on an extensive scale, for the defence of a besieged town, a breach can be more readily repaired, although the enormous projectiles that can be hurled against any defensive works from the rifled cannon of the present stay, will render the formation of a breach a more sear task, and sooner accomplished than it was

Somethy. Bred (Ger. brod, or, Ang. Sax. brayed, from broy, to pound in a mortar), a very important article of food, made by baking, in an oven or pan, a mass of dough composed of the flour of different grains mixed with water. Bread has been used as food by manking from the very earliest times. The necessities of man's mature have been the origin of many of our useful aris; and the discovery that grain when moistured and afterwards heated could be made into a

palatable, darable, and autritious food, considered a very important one. This the extiest form in which break was not step would be the pounding of the re stones, and the formation of four; the la-te the balding of lowes or fermented. be the baking of course or terminate mentioned in the Sariptures that Abraham leavened bread; and also that, in the three leavened bread was used (Rxod, xil, 15). The saries of the sar unlesvened bread is a very simple matte the ordinary sailor's biscuit is an exam BISCUIT); but the baking of leavened or the bread is a complicated although common Bread is made from the flour of any of the pread is made from the flour of any of the enrealy-wheat, cye, barley, oats, &c.; but as wheat is the most nutritious grain, it is most generally used. It is also the only grain from which a light porous bread oat is made. Wheaten dough, cleared from the brain of husks of the grain, consists of water, glaten, starting sugar, and dextrine, or British gum. If dough is left by itself in a temperature het man and with the sugar, and destrine, or British gum. If desigh is left by itself in a temperature between 80° and 120°, formentation slowly takes place. The starch is first converted into sugar, and then into alcohol and carbonid acid; if baked at this period, a light bread with as agreeable relish is procured; if, however, the temperaturin goes on too long, acetic acid is formed, and a heavy bread with a sour taste is the result. In order to procure a more perfect fermentation, a leaves is employed. This leaven is either a piece of dough in a fermenting state, or years, a substance tradecod is fermenting state, or yeast, a substance produce beer while in the act of fermentation. Yeast is: generally used, as it is quicker and more certain its action than the leaven of dough. In order to be loaf of bread, a small quantity of yeast is well kneaded into a mass of dough, and allowed to remain in a moderately warm place. Fermentation begins to take place; and, as the carbonic acid and alcohol are disengaged, they struggle up through the elastic mas and the loaf begins to "rise." It is then put into it oven, where the increased heat causes the further ar pansion of the inclosed gas and vapour. The process of fermentation is soon checked by the high temperature, and a light porous bread is at last produced. Well-baked bread is known by its lightness, and the regularity of the size and distribution of the small ils formed by the carbonic acid gas and alcohol Home-made bread is mostly sweeter, lighter, and more retentive of moisture than bakers' bread. recentive of mosture than takers creat. The following process is largely employed in the trade;—Mashed potatoes, water, and patent yeast are mixed together to form a ferment. After the quantity of four required has been put into a trough and mixed with water, not too cold, the ferment is added and well stirred with the hands. It is then strained through a sieve, more flour added, and the whole well mixed; after a little flour is sprinkled over the top, the dough is allowed to stand for five or six hours. During this time, the sponne, as the dough is called, rises twice. The first rising is allowed to break and fall down; but upon the second rising, just before breaking, a quantity of water is poured into the sponge, together with salt, and sometimes slum. The whole is then well mixed together again, and, after standing for some time, is divided into the necessary sizes and conveyed to the over: into the necessary sizes and conveyed to the over. The amount of potatoes added to the flour in this process is very small, the proportion being 3 has of potatoes to every 280 hs. of flour; but some sheep-bread bakers use a much larger quantity. It is expensionally called fruit in the trade. It is a comparatively harmless adulteration; but the alum, or styf, is a more objectionable addition. By using alum, a meak whiter quality of bread is produced; how this bleaching operation is effected is not thoroughly understood. Alum also causes the loaves to break from each other with a much smoother surface than when break is baked without it. Common sait is also used for the same purpose; and on the continents small guardities, of sulphate of copper have been used by the bakers. It not only produces a white break from inferior kinds of flour, but adds greatly to the retentive capabilities of break for water. Sulphate of copper has neverbeen discovered in English break. Besides being much adulterated with mashed potators, rice flour; often found in break. Rice flour absorbs and retains a large quantity of water. Carbonate of magnetia is Alum also causes the loaves to break from each oth

When wheat flour flour, or any other tion can be discovered The presence of mineral ertained in the same manner. eries varieurs of bread are made from the possities of wheat flour. (See Flour, Whear.) The bread made from the other cerealis is so he breed made from the other cereans as that made from wheat. Brown breed is as that made from wheat, the husks have been con wheat most in which the busks have been up with the rest of the grain. It is considered again; and other chemists to the grain. ably and other chemists to be much more and wholesome than ordinary white bread.

man, Day of (Let. dies panis), was one of the service in early times to the Lord's day. Chry-on says that it arose from the general custom obis the primitive church of meeting together on sy to break bread and to receive the communion.

BELLE-FRUIT. (See ARTOCARPUS.)
BELLE-BROW, bred'-room, a name given to the place

s the bisenits are stored on board ship. It is

a first ceted from damp, and kept warm. note a method of treatment by which harmony of and a judicious and proper blending of distant light sand an indiction and proper braiding in distanting in standing its obtained in the background of a picture, out entirely neglecting detail and throwing it into the continued undefined mass, as was the custom as early isadecape-painters, in the background of a pictures nothing could be distinguished. Of the pictures in the picture was the custom to the picture of where pictures nothing could be distinguished.
Turners paintings, Mr. Ruskin observes, that "the conception of every inch of distance is absolutely come and clear in the master's mind . . . but yet, rly and fully as the idea is formed, just so much of it is given, and no more, as nature would have allowed in to the line out of the millions there is without meaning, yet there is not not like the is not not like the is not not meaning, yet there is not not like the line of line o en, and no more, as nature would have allowed nature with her harmonies is meritorious and beautiful; but the breadth which annihilates those truths by the million is not painting nature, but painting over her." Proper breadth of treatment is therefore obtained by third acherence to natural effects, and in the pro-

ratiful scherence to natural effects, and in the pro-close of masses of distance, which are the results of spht concords and relations of details," instead of the as result from the disappearance of details alto-tion.—Bef. Chambers's Encyclopedia. Butterns, brail-less (Sax. bracan, to break), Mar., a term applied to a peculiar kind of less that may be easily distinguished by the the form with which they cover the surface of the form with which they cover the surface of the form with which they down the surface of the form with which they cover the surface of the form with which they cover the surface of the form with which they cover the surface of the form with which they cover the surface of the form with which they cover the surface of the scenar where rocks it is hidden below the in the ocean, where rocks its hidden below the set, over which they break with great violence; when ones a ship is driven amongst them, it is impossible to save her, as every billow that he her an ervery to dash her down again with additions, when it breaks over the rocks or sands

ma Burr, brei'-king, in the law of Scotland, Supply maken use of an article, or a portion residen he cannot object to it on the plea of or return it to the seller. Traders ought ostlenge on ascertaining defect in a le dainy will exclude the objection, anded.—Bef. Bell's Principles of the

SUPP, in Mil., a term applied to the 840

#### Break

bank of stone, so placed as too sea, pajore the entrince into a s Plymonth Breskwater is a very s of this kind of barrier. The sound harbour of Plymouth was very a harbour of Plymouth was thenever then the south-west. Many ships significant the south-west. Many ships significant the transfer of the south-west. lost through its exposed state and through its exposed state. Landon breakwater was inst proposed by Lord to Lord Howick, then first lord of the 1800: but it was not until 1812 that the and Whichy's plan was adopted and the menced. The mode of proceeding was that of de in mid-channel large blocks of himestone carrain a neighbouring quarry. These stones were to the site of the breakwater in ventels of p construction, having openings in the stern, out of in the stones were cast into the sea. The large at used for the construction of Plymouth Breaks were conveyed to the spot whence they were dropped into the sea in fifty three versels of alle fifty tons each. From one of these vessels a load fifry tous was discharged in about three house. In the vear 1812 the whole of this fleet discharged 18,015 tons of stone; in 1813, 71,198 tons were deposited; in 1814, 239,490 tons; in 1815, 2\*4,207 tons; and in the year 1816, 206,033 tons. Up to this period the guan of deposited stone amounted to 898,983 tons; but it amount was subsequently raised to above 1,000.6 amount was subsequently raised to above 1,000 tons. The proportionate dimensions of the depo blocks of stone were nearly as follows :-

Of five tons and upwards ...... 12,760 tons, Of three to five tons 150,593 ...
Of one to three tons 509,705 Of one ton and under ...... 433,904

For quarrying of this stone about 2s. 5d. a ton wash and for the carriage of it is, 10d. was paid. Assorbing to the best calculations, the cost of each ion of the sunk in the breakwater amounted to about \$4.15 The total estimate for the completion of this break water was originally £1,524,000, but the sums bitherto expended upon the work amount upon the whols £1,562,639. The engineer of this breakwater was 1 £1,562,639. Bennie, who died before the undertaking was com-pleted. The breakwater, which is thrown screen the middle of the Sound, lies almost due east and west, and is completely 'soluted, leaving a chaquel of half mile on either side. The centre porties, was straight, is 1,000 yards in length, and there in wings 350 yards long respectively, which incline to the north at an angle of 120 degrees to the at portion. The breakwater stands three feet abo portion. The breakwater stands three feet above level of the highest spring tide, is 120 yards by the base, 16 yards at the top, and has an average of 14 yards. The sides, which base a consideration, and the top are faced with masonsy. ciency of the breakwater as a protection to the has often heen proved, and two years after it we menoed ships of all sizes began to take shelter it, although only 600 yards of the work week visible at low water. The breakwater at Civil. which was constructed by Trajan about s.p. 10 markable, as it appears, according to Pliny il that it was made in a very similar man Plymouth.-(Plin., lib. vi. epist. 31.) Fo water, which was finished in 1861, form rotection to shipping. It is comp from the neighbouring promoutors. The work, which was almost entired convicts, was commenced in 1847. Portland Bill, commonly called P very dangerous, and the present I ing its force, will make Por mouth Bay more secure harb Breakwater, which has b tion, has made very also progress nation an enormous sum of money, deep, there being seven fathoms at there is no stone in the saighbour tion, has made very slow

Cherbourg Breakwater is d, and has cost, since 258 WORK SI IDS KEEL, MILL HOR OUT, MINDS HER OF SOURCE IN WAS COMES AND SERVICE OF SOURCE OF SO tree, the convex to the north, across the he bay, leaving a passage 1,000 yards wide aids. It is principally built of grant- and In 1859 Mesers Bichardson and Jaffrey, neers of Durham, completed an unvention relating protective sea-works of various kinds, as, for inof defence of the coast against the action of the for the defence of the coast against the action of the wind and waves, or for the protection of shipping Plate XXII., fig. 1, represents, in side clevation and partial vertical section, a breakwater according to Meters. Richardson & Jaffiev's plan, ig 2 is a corresponding plan, and horizontal section of the same. In constructing a harbour of refuge, the investions build a series of iron towers (A A), which wants having demonstrad in the sea at a certain distance. upon being deposited in the sea at a certain distance stunder, extend outwards and partially in lose the required extent of sea-room. The figure of these ers is mrcular in transverse section, wide at the and tapering upwards, and they are constructed of malleable from, but, instead of these materials, asy be built of stone or timber, and made solid thing to the method to be later described. When the towers are formed of metal, a traming of perpendi ouler and preserves circular or cylindrical libs is bolded together, so as to form a skeleton figure of the edstermined shape. Upon this internal framing sets of cast or wrought iron are riveted or otherwise sured. The height and size of these towers must mend to a great extent upon the depth of water and the position of the work. The fowers being sunk at the desired spot, the water contained within each is primped but, and the interior filled with masoniv, the blocks of stone being previously cut to the required shape on shore. In this manner the work may be carried on with great rapidity, the coment used in the building stations being meanwhile wholly protected from the Instead of using stone as the material for filling in the towers, concrete, "beton, or other hard-drying plastic cement, may be moulded unto blocks of the required figure on shore, and dried these blocks, when litted into their proper pisces within the power, are to be comented together with a little maintage of the coment or plastic insternal used for moulding the blocks The inventors in some cases give the preference to another mode of proceeding, via to all the whole of the interior of each tower with "beton," or hydraulic cement, as shown at B, fig 2, which cement bondifying within the tower, the whole frems a compact and solid mass, capable of withstanding the waves of the sea after the removal or wearing away he external plates of metal. In hea of this solid a of "beton," a filing-in may be used composed the of "befor," a filting in may be used composed "befor," having a central mass or core of slar, as C. fig. 3. the interstoce of which may be filled up th liquid, so as to form the whole into a solid mass is operation of illing up the towers with miscorry or its plantic material is materially facultated by the measurement which the summits of the towers afford refliging which the summits of the towers afford to once laying down a permanent gangway of road though the tower to the other, along which materials Then this down to the other, along which materials implantation may be conveyed with nearly the same its act on shore. Instead of constructing the towers was, they may be built wholly of stone, a suitable non-being sumit over the epot where the tower is to rected. This water having been pumped out of the con, the work may be conducted with great rapid-may be appeared by the configurations towers. All

holted together, open restant between the contiguous various Another mode of constructing th them of cast-iron pipes or of malles addition to the protective action there is another and highly important a ing the use of them in harbours and of works, which is, that from their open they prevent the silting up or accumulations do the harbour, as the tide has fr egress through the open screen, so that depth of water is miintuined. The count depth of water is miintuined harbours, piers, or quars upon this plan sessels approaching close up to the toners; thus ing the waste of room and inconvenience at long sloping sea-walls of the ordinary consta situations where a rigid or impermeable requisite, the intermediate spaces between the are tilled to with a wall of masonry, as at FE formed of blooks of "heton" or concrete as together, and defended, or not, on the outer crises aide, by a lattice work of timber or metal. For structures the towers mas either be the simple tower sunk into its proper place, or it may or wholly fuled up with mesonry or other and According to this system of const breakwaters or other similar exposed works, is as possible to carry out such works in a magnes more economical, no portion of the materials engigles being wasted. In the year 1828 a commission appointed by the American Government recommended. York harbour to the mouth of Chesapeake Bay th nors neroour to the mouth of Chesapeate hay there was no good place of shelter along the cosst for vessels exposed to easterly gales. The entraines of Delaware Bay on the south side was nadged the most advantageous point for constructing a harbour of refuge, though it was both open to the most dangerous gales from the Atlantic and those across the waters of Delaware Bay from the north-rast by the north round to the west. The place is also expe to the fie ds of see that are brought down by t to be he do to toe that are drought down by the each tide during the winter. The plan of the breakwater was consequently designed to guard against dangers from these different directions. It consists fixes of a straight mole 1 203 yards long, in water of five to sat fathoms deeth, the sea slope being curved after the curvilinear figure assumed by the breakwater at the curvilinear figure assumed by the breakwater at Cherbourg The work was commenced in 1829, under the direction of Mr Strukland, and in 1834 it was so far advanced that vessels found a protection behind it The stone used in this work was obtained from a variety of sources-some tiap rock from the Pales in the Hudson river, green-tone from the southern part of Delaware, and guess from different quarries in the same state. These rocks, though swares ng a weight of 175 lb to the cubic foot, were mentioned to nithstand the action of the sea in the course of the construction of the moles. During the winter season those upon the surface of the work water more season more upon the strates of the wark ware were or less displaced, and a large piece of seven weight was moved, in one storm, eighteen feet in must slope of the nee-breaker, down which it lost At the same time, about 200 tons of a leavy stone, which had been thoroughly wedged compacted together, was form up and awent over the inner side. In the United States there have a been constructed breakwaters of considerable mag tude upon the great northern lakes, for the prot ton of harbours, as at Buffelo and Clewsland. tude upon the great novier names, up and a tion of harbours, as at Buffslo and Clevelai Lake Eric, and Chicago, on Lake Michigan. first-named is a massive pay of stonework driven in rows into the sand are sometimes confor the construction of breakwaters; but they little service in exposed attations.—Bot Riph Dana's New American Cyclopadia; Eng. Esc. of Arts and Sciences; and Mechanic's Mag.,

## Benam



beat two feet.

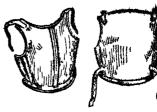
deep

deep and still parts of proportion to the length of the body, this fish is extremely. and thin In length it is Its flesh is not in very high repute

Rubart, brest (Sax breest), in Anat, is a term applied to the whole of the anterior part of the thorax. In a more restricted sense it is applied to the two grobular more restricted sense it is applied to the two grobular fleshy produberances achering to the antorior and late rai regions of the thorax of females, and contaming the manuary or lacted glands. On the middle of each breast is a projecting portion termed the pupilla or supple, in which the oxoreforty duets of the glands terminate, and around which is a coloured orb or discouled the surveola. The use of the breasts is to sente milk for the nourishment of newly horn infants. erete mik for the nourishment of newly born infants They are composed of common integuments and adipose tissue, in which are lodged numerous ducts ra-disting from the nipple, and atterwards dividing and subdividing into branches and twigs until they to minute in very minute vessels. The enlargement of the breasts is one of the signs of womanhood Their fullest development commences in the earlier states of pregnancy, and they continue to increase in 8.20 mill about the time of delivery, when they are filed with the lactest fluid, which passes readily on suction facts mouth of the child. The breaks of females into the mouth of the child are subject to a variety of disorders, one of the most common of which is inflamman in . It may be pro-duced by various causes, as, a blow, exposure to cold or wet, great mental excitement, excisive accum its most Prequently within the first three months after particulan, and is characterized by great heat, plus, sedness, and swelling of the breasts. The plus is in edness, and swelling of the breasts the smilery glands The breasts become tense heavy. the mallary glands The breasts become tense heavy, and painful to the touch, and there is high inflamma for forest The treatment consists in the application tory fever of lesabes and warm fomentations to the part, and the of leaders and warm iomentations to the pair, and the administration of purgatures. If the inflammation do not subset to the after the pair, and the subset in a few days, suppuration may be expected. In general the abcess may be let to nature, but when the document of the pair is decision. Chronic inflammation sometimes seate that he had a better to who are a truling it apply a tong will in this beauty in which case stimulant applications will be found useful. Where this is attended with abscess, it should be opened, so as to give five exit to the pus, and pressure applied to the part. The breast is also subject to verious kinds of tumours, some of which may be greated of by simple pressure, and attendance to the general health Sometimes some of the actificans ducts are blocked up, producing an enlargement ferous ducts are blocked up, preducing an enlargement termed hartest tumour. It is to be reint died by puncturing the duct, and keeping it open for some time. Occasionally great pain and uneasiness is felt in the breast from sympathy with other parts of the system. There is no inflammation, swelling, or external alteration of the manusca, and yet the pain is sometimes excessive, assistly inhermittent. In this case the general health is called in the belief of the work of the control of the control of the system and the control of the contro

## Dream

Life-grands and Horse-grands in this coupley, by the magnificant Coupleydes of this engineer. Frame. They are errormental, but expensive, and from medical, as they are not built-point. The brieses, was first adopted instead of abanamed by the Motione, in the early part of the lath contary, and to 1401 its use had become general throughout for I nucleaval armour it was attached to the bank-plat buckles and straps of leather. It was often



BREASTPLATE.

DACEPLATE.

ingly-poinhed steel, and dams shoened, or misid with grid specimens may be terminate collection of sumous in the Tewer of London. The hinder half of this article of defensive attire is called a harkplate. Among the ancient Jews, the breastplate formed part of the or ments of the high priest, and was composed of righty-embrondered stuff. It was about ten medes equare, embrondered stuff. It was about ten unches square, and had upon it twelve precious stones and in gold, on es h of which was engraved the name of one of the es no which was engraved the name of one of the tr beast larged in four rives, three in each row. The breastplate was fastened on the breast of the high prices by the four corners, thouse at the top to each shoulder lose, by a golden book or ring at the end of a wrighted chain, and those below. to the girlle of the ephod, by two bine strings or milions, which had I kewise two rings and hooks. muons, which had I hewer two rings and books. This ornament was never to be requiated from the priestly girm its, being do igned to round the priest how d ar those tribes should be to him whose assesses he hore upon his heart, and konce it was called "the memorial". It was also called "the breastplate of judgment," probably becaus it contained the Union and I hummin, and revealed the judgment and will of Got.

BREASTPLOUGE, bree' -ploud Sax breest, becaut, ploys, plough), a plough driven by the breast, used to cut on page turf

pare turf
BRRAST WHTEL, brest wheel (Sax. breast, breast,
Art.cl, whet'), a varily of water wheel, which may be
divided into two classes,—the high breast-wheel and
the low breast-wheel. In the former case, the which
is mired by the weight of the water, which it receives
a little above the height of its axis. In the latter case,
the wheel is moved by the supplies of the water, which
it receives a little above the leave of the water, which it receives a little below the level of its azes

IN receives a little below the level of 148 alia (Not Markework II) brond vanices).

Billastwork, brest' werk (Nox breest, breast, opened eyerm, work), in Mil, a mound of earth, with a dry dich in front, formed by the gravation from which the earth that makes the mound is taken, liabilly thrown up for the protection of troops on output the protection of troops on output did not on any exposed cituation A row of galakous filled with earth, for the shelter of men in the treathest or elevators, as also called a frequent work. An affective muce with earth, for the shelter of men in the treoches or elsewhere, is also called a breastwork. An affective breastwork may be readily extemporized by felling a few trees, interlacing the branches, and filling the intersince i with sods and earth. The breastwork must not be confounded with the spanishment and parapet.

(See Pratikking Paraper.)

Reland Masth (day hough) in the abstract of the confounded with the spanishment and parapet.

is a generally found useful. Imple shields of ivory is given, with India rubber tests, should also be used the shippins are too treader to bear the application of the child's mouth. (For cancer of the breast see the shippins are too treader to bear the application of the child's mouth. (For cancer of the breast see the child's mouth. (For cancer of the breast see the child's mouth. (For cancer of the breast see the child's mouth.) If maken, in Min., a term used by miners to denote the ungered of the condition of the internal passes of noise of ore upon which they are working maken in the condition of the internal shows and in this case purpositives and to internal shows are to be administered. Constitution in the condition of the children ways. Sametimes it is owing to a derauged state of the dipositive ergans, and in this case purpositives and tonicis are to be administered.

## Breath-Figures

condition of parts about the month or a teach or morbid secretions about the to cases, the teeth should be frequently or mouth should be maked with a week a ride of lime or sade. Inhalation of water, into which some creative has been dropped, it is mong rifles and fowing places, the Freenommanded in cases in which the cause resides in gun, or is Fundament, the Frankian need the noise and respiratory passages. The flyation of a lacob's and Recyristifies. (See Hanny E Johns of a suiphate of wine or copper, by means of a Riving Riving Syntage Riving Consented syrings, into the nostbils will frequently be of use when a rivi-Hanny Kifle, Needle-gur, Ombits the disorder has its seat there. Feld breath may also arise from a diseased state of the lace

may also arise from a diseased state of the lungs. Where it cannot be remedied, it will be well for the patient to chew a little cinnamon occasion-

pared for to take some of the aromatic purpose.

Take real forcess (Sax. brath, breath; Lat. figure, figure)—if s clean surface of glass or any other pulished substance be written on with the surface be

any other polished substance be written on with a binot-pointed instrument, and the surface be afterwards breathed upon, the characters written with become visible; or if the surface be first breathed upon, and the characters then marked upon it, they can be again made perceptible by breathing again upon the surface. These form what are called breath figures, which may be produced in several ways. In 1842 Moser informed. Humbridge that it is a very bodies be because for the surface. Humboldt that "if any two bodies be brought sufficiently near each other, and face to face, one of them impresses its image on the other;" thus, if a coin be placed for any length of time upon a piece of polished metal, the metal will retain an impression of the coin, and exposure to the vapour of water, iodine, or mereury, will make it visible. A glass used to protect an engraving will receive an impression of the engraving on its inner surface, although it is not in absolute conset with it. Engineers have remarked that those parts of machines which are in contact with, or near such other, rapidly and easily impress themselves upon each other. guet has stated that the letters and inscription on the sak of the inner cases of his watches have been often

found impressed on the inside of the outer cases. Perfact impressions of objects may be produced by means of electricity; and remarkable varieties of roric figures

est be impressed upon glass surfaces by means of a small electrical machine, a Leyden jar, and a discharging rod. Photographers know that the state of the breath has a very considerable influence on the plates

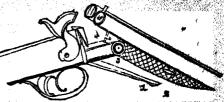
they use; and its effect upon other arts has been re-marked in the Dict. des Arts et Métices, Lyon, 1801. Artista in enamel-painting are taught that no one should be sllowed to approach their work who has been taking mercurial medicines or eating gartic. Buzocia, brech'-che (Ital., a crumb or fragment), in Geol., a rock consisting of augular fragments bound or comented together by calcarcous, ferruginous, or siliclous matter. Such a rock differs from a conglomerate,

or puddingstone, in having its component irragments irregular and sharp, whereas the peobles of the latter are rounded and water-worn. (See CONGLOMERATE.)

BENEGUES BIBER. (See BIBER.)
BENEGUES BIBER.
BENEGUES DEBUT (See BIBER.)
BENEGUES DEBUT (SEE BIBER.) secon of ordnance and field-pieces, as well as rifles and forting-pieces, with a moval-le breach, to admit of the charge being inserted at the breech end of the gus anseem or us muses. Dresca-loading guits are infinitely superior to those constructed on the old principle, as they can be loaded with much greater rapidity, and can be cleaned with greater readiness and sately; the bore of the gun can also be more acthey grouped in the case of rifled pieces, and the recently preserved in the construction of smooth at and the bullet or projectile can be better adapted o at the grooves of the piece or calibre of the bore. seach to the main part of the gun, and to insure suffi-sions strongth to rease the explusive force of the powder. esent strength to remain the explosive torce of the provider. Ing are as follows:—The kind of animal from which This renders a steapon constructed on this principle, the breed is desired include have distinguishing positing more expensive; but the noticy is counterbalanced by which ought alwars to be kept in rise. The most fine pieces composing a field bettery can be moved from the principle of the present of the pieces of manufactures. Suddens and persentance. Suddens place to enother, as infinit breech-loading guas crosses should always be avoided, and, if possible, two

## Breeding

imed the Assistrony and V mose Guy, Karry Ors,



BREECH-LOADER.

accompanying illustration shows,—1. A lever which opens the mechanism, but at other times lies flas against the gun. 2. A slide that assists in the opening and closing. 3. A central pivot round which the movement is made. 4. A notch, which allows the barrels to be so placed as to be easily loaded at the breson whom a hook is liberated. 11 is a pin which, when struck by the hammer, transfers the blow to a cap inverted in the cartridge. the cartridge.

BREEDING, brede'-ing (Sax. bredan, breden, to bred is the method of multiplying and improving the in of domestic animals rapidly. Great attention has paid to the subject of breeding since the commipaid to the surject of oreging ance the commence ment of the present century, one motable result being that within the last thirty years the weight of matter produced has nearly been doubled in proportion to the number of sheep. If a proper supply of food is far nished, any breed of animals will perpetuals their the various breeds of wild animals are instances of thi But when assiduous attention is paid to the breeding of domestic animals, varieties are produced which are more useful and profitable than the wild breeds, on account of particular properties which they possess. The first point of importance in breeding the selection of the animals with which to propagate a useful race. These should always be the finest animals possible; and great improvements in the stock existing on a furm are often produced by the introduction of on a furm are often produced by the introduction of males of a superior quality. In breeding, the purposes for which an animal is reared must always be taken into account. The breeding of horses has occupied attention much longer than that of overs and shears. One class of horses is bred for speed, another for one-minimum of the production of the produ veying rapidly between different places, another for mere labour, or to assist human strength. By attention to the breeding, great excellence has been arrived at in each of these varieties. Strength and speed in their extremes are never present in the same animal; but a combination of the two is most useful. (See Horse.) The properties desired in sheep and over are very different from those required in horses. The fleeces and hides of the former are used as raw materials for manufacture, and their fiesh as food. The breeder of oxon and sheep sometimes has the perpetuation of good qualities in view, and cometines the production of the largest quantity of best or mutton possible. Since attention has been paid to the breeding of these animals, they have been sent to market at ing of these animals, they have been sent to market as much earlier age. Sheep and ores which have been thus improved are both distinguished by small heets, and lib ones, short legs, and thus akin. Wild animals have precisely opposite qualities. In breeding any domestic animal, a near relationship should always be avoided. The principal points to be charged in breeding are as follows:—The kind of animal from which the breed is desired should have distinguishing posits, which ought always to be kept in rise. The most

nate kind should be bred dis

or more families of the name cind should be bred distinct, buly occasionally crossing them together. The more improved a based becomes by this mean, the more infrared becomes by this mean, the more infrared becomes the adequate by the mean, the more infrared becomes the adequate of the unimals by which it continues it, and vary often, on account of this difficulty, a highly amproved inseed will degenerate. (See Or. Samer.)

BRINKI, breefe small cinders mixed with ashes, used as held in tirick-kilns. The word is apparently a corrunting of the Franch word braits, live out.

BRINKING (A. breezes), in Mar., a shifting wind that blows thating sertain hours of the day and night, from the state of the first alternately; and is only sensibly felt near the neart. The sea-breeze generally rises about 9 in the meaning, proceeding slowly, in a fine curl on the water, towards the shore, gradually increasing until 12, and dies away about 5, when it is succeeded by the land three, which also continues increasing until mittight, and is again followed, in the morning, by the sea-breeze, which also continues increasing until mittight, and is again followed, in the morning, by the sea-breeze, Breezes differ from etesia, or trade-winds, issummed as the former have their periods daily and much as the former have their periods daily and

magnity, and are only found near the coast, while the latter are annual, and blow at a distance from land.

Bernow Laws, bre-hon (Lat. brehonicæ leges), were the general rules of law observed in Ireland by the Breions, at the time of the conquest of that country. by Henry II. The Brekons were the provincial judges among the ancient Irish. By some writers they are said to have been a distinct tribe, baving competent lands allowed to them in inheritance; by others to have been hereditary magistrates attached to various tribes. Their decisions were generally made in the open air, on the tops of bills; where particular spots are frequently called, to this day, Brehon chairs. In criminal cases the Brehon had the eleventh part of all the fines, which could not but be considerable at a time when murders, rapes, robberies, and the like offences, were only applect to pecuniary commutations. When the conquest above mentioned was effected, the laws of England were received and sworn to by the Irish of England were received and sworn to by the Irish mation assembled at the council of Lismore; and afterwards. King John, in the twelfth year of his reign, went into Ireland, and carried over with him many able asges of the law; and there, by his letters patent, in right of the dominion of conquest, is said to have conducted and established that Ireland should be governed by the laws of England, which letters patent Sir Edward Coke apprehends to have been there confirmed in markingent. But to this ordinance many of the stable of the council and the cou firmed in parliament. But to this ordinance many of the Irish were averse to conform, and still adhered to their Brehon law; so that both Henry 11I. (A. R. 30; 1 Rem. Food. 442) and Edward III. (A.R. 5; 3 Prym. Rec. 1218) were obliged to renew the injunction; and Edwards in a parliament holden at Kinkenny, 40 Edward III., under Lionel, duke of Clarence, the theu lieutenest of Ireland, the Brehon law was formally abolished, it being unanimously declared to be indeed ne law, but a lewd custom crept in of later times; and yet, even in the reign of Queen Elizabeth, the wild native still kept and preserved their Brehon law, which opensor describes as being "a rule of right unwritten, out delivered by tradition from one to another, in which obtainings there appeared great show of equity in determining the right between party and party, but in many things repugnant quite both to God's laws and many. The latter part of this character is slone accribed to it by the laws of Edward I. and his grandson. Spensor was wrong in speaking of the Brehon likes as an impristen code; for several fragments of laws as an invertion code; for several fragments of them are still in existence in public and private hisraes in freiand, Belgium, and England. A translation of these laws has for the last eight or ten years been in the second of preparation for publication at the second of manuscripts of the Leges Brebonius of manuscripts of the Leges Brebonius brought significant were those in the Chandos collection, containing twenty-two sheets and a half closely written, hilloft abbreviated words, and not very legistrates, hilloft abbreviated words, and not very legistrates. Because and some modern writers have stigmanised these laws as most wicked, because murder was empounded by bribery. But the principle of peculary compensations for all orimes pervaded equally the tables is a sea those of all the German nations.

#### Brethren, White

p. 1639), edst. Hughen; Pryn. on Cost. 348; I Prys. Nov. 1877 Co. Lett. 141; Byman's Rushira; T. Fryn. Bo 1218.

Barra Goom. (See Goom.)
Barra Goom. (See Goom.)
Barragueran, bree's no new (Fr. commer, a lintel), the name given to any large beam, used to support a superiscombent mass of massury; such as the beam placed over a shop-window to receive the weight of the front of the building that rises over it. A leasn placed across the ceiling of a room, to support a partition shows it, is also a breesummer. The word is sensotimes spett

It, is also a dissentance.

Distribution for the following of the control of the sors of the Christian religion. It occurs frequently the New Testament, and was current in the said church. Subsequently it came to be applied to the complete members of the church, as distinguished from the content of the content the catechamens. It came, also, to form part of the name of several religious sects; as, the Bohamiss

Brethren, Plymouth Brethren, &c.

BRATTHEM AND CLERKS OF THE COMMON LIFE, was the name assumed by a religious fraternity that made its appearance about the end of the 18th denkury. They lived under the rule of St. Augustine, and are said to have been eminently useful in promoting the cause of religion.

Cause of rengion.

BRETHEN AND SISTERS OF THE FREE STEET, in Eccl. Hist., the name of a sect which sprang up towards the close of the 13th century, and gained many adherents in Italy, France, and Germany. They took their name from Rom. viii. 2, 14, and maintained that the children of God enjoy through the Spirit a perfect They were freedom from the obligations of the law. pantheistic in their creed, holding that all things flowed by emanation from God, that rational souls were por-tions of the Deity, and that by the power of sontemplation they became united to him, being thereby freed from sintul lusts and the common natural dissincts, and acquiring a glorious and sublime liberty. Hence they concluded that the person who was thus absorbed in the Deity became a part of the godhead, and we have the children of the godhead. and was freed from the obligations of a't las and was freed from the obligations of a "Law Buman and dvine. They treated with contemps all Christian ordinances and all external acts of religion, as unsuitable to the state of perfection at which they had arrived; and many of them are said to have lived very licentions lives. Many edicts were published against them, but, nives. Many curts were published against them, notwithstanding the severities practised against them, they continued to exist till about the middle of the 15th century.—Ref. Mosheim's Ecolesiastical History.

I-IETHREN OF THE CHRISTIAN SCHOOLS (Fr. Po des Ecoles Chréciennes, also Frères de la Dactrine Chré-tienne), a religious order instituted at Rhoins in 1681, by Abbé de la Salle, and approved by Benedict 1711. in 1724. Its object was to afford gratuitous instruction to the children of the poorer classes, in the elements of religion and primary education. The members to the children of the poorer classes, in the property of religion and primary education. The members take upon themselves the vows of chastity porterly, and obedience, taken at first for three years, and then renewed for life. This order has been of the utmost benefit in the cause of of education down to the present to the present the cause of of education down to the present than 1.255 schools. time. In 1856 it numbered no fewer than 1,235 achools with 252,215 pupils in France, and 88 achools with 16,709 pupils in Belgium; besides numbers in other countries. They have from time to time modified their instruction to the wants of the classes whom they teach, and instruction in many of the higher branch of education is now communicated.

BRETHERN OF THE HOLY TRINITY, an order of mos founded in France towards the ulose of the 12th cen-tury. They were also called Mathurines, and Brethern of the Redemption of Captives, the redemption of Christian captives from Mobammeden slavery being

one of the principal objects of their institution.

Brethren, Plymouth. (See Plymouth Brethren.)

Brethren, United, Moravian, or Bohrman. (See

BRETHERN, UNITED, MORAVIAN, OF BOHRRIAN (See BOHRRIAN BRETHERN)

BRETHERN, WHITE (Lat. Progress Albert); in Ecol. Hist., was the name given to the followers of a priest from the Alps, who made their appearance about the beginning of the 15th century, and were arrayed in white garments. Their leader carried about a cross, and andeavoured to persuade the European mations to renew the holy war. He practical many acts of more-

sh was proscribed by Edward subjection of the country in a descendants of the ancient o inhabited the southern portion Res Scots, properly so called, appear a freignd about the 4th century, and originally on the west coast, whence e northern parts of the country me united under one king in the carly the 12th century. Of the laws of the Brets only a small fragment has been preserved, it by Sir John Skene in his Rema Mojestas, and ally in the "Acts of the Parliament of heat It fixes the value or each or e s life, which, if he Sind." It flees the value of each or a life, which, it no wave class, was to be paid to his kindred line, the value of the kings life was 1,000 cows, or 3,000 pieces of the coin called ores, each of which was equal to sixteen painties. The kings son, or as the painties, the coin of a value of a coin called ores; as coin or a thene, at 100 cows the son of a theme, 665 cows. The value of a married woman was non-third sees than that of her husband, and of an understand the comman has bruther. Other laws sarried woman the same as her brother Other laws iz the emount of fine to be paid for drawing blood, sounding to the rank of the wounded person and the blace of the wound—Ref Chambers & Lucycles relic Basimon, (See Bratice)
Basimon, (See Bratice)
Basimon, (See Bratice)
Basimon, offer wall di —After the division of

BRETWALDA, bret woul' di —After the division of national into the Heptarchy under the Aunio Saxons, netand into the Heptareny uniter the tomore he kingdom was governed by its own mount of the than constituted utilities supposed, however, that they sometimes un ted toge ther under one head or thief, called the Bretweida He was a bemporary war king, who governed the whole of the Sazons in the seven kingdoms, and led the troops to battle against their common foes, the Celts

ANGLO-SAZOVA.)

Banva, breev (Ital , from Lat brevs, sh rt) -This is (much used in succent music) was, a ording to the notation of Guido d Arezzo, equal in duration to find whole bars, its present value however, is equi values to two semiliseves, four minims, or c glit of or chets. It was formerly written of a square figure, i ut at the present time is the same shall as a semilieve,

with the addition of two lines on each sade. It is suidous or ever used now, except in cathedral music Extrem, beverf (Fr. breect, a wirt, warrant) - Give rai promotion by brevet, applicable to captains in the army and marines, and communiters in the navy, and all afficers above the ranks named in each a true re all officers above the ranks named in each since repreciting, conveys morease of pay, as well as position at the same time, which heret rank does not (See Busher East) Since the reign of James II it has fixing part of the system of promotion in the array Fermionist is was resorted to at least once in six years, but astonay it has been conferred only on particular occasions, each as the accession of a sovereign, a colorantees which has the accession of a sovereign, a colorantees. mation, the birth of a prince, the commencement or conduction of a war, &c A brevet adds to the ex-penses of a nation without increasing the efficiency of the array; and an officer might possibly gain step after step in succession until he filled a high Linde in the the army; and an officer might possible gain step after step in ancession until he filled a high prade in the serving without having been engaged in actual service in the field. It has, he were, the utility of recoming the file of general efficients with men whose s<sub>c</sub> better fits them for solive service. General prom too by betters body place in the years 1837, 1818 1841, 1846 1861, and 1862, during the reign of our present sovereign; and the average increase of expense to the vocative at such effects there was from \$15,000 to £.0.000, while the last payal brevets have cost a similar sum in increased half-pay. The average increase of pay to each effect at a general brevet has been calculated at about \$30 per smann.—Ref. Chambers's Encyclopades.

a time with anot purpose; se, in service on co purpose; as, in service on coursement his own regiment only, or with any deli-same, he takes rank according to the de-mission in his regiment, while in serv-mertial, or otherwise, in conjunction a other regiments, he takes precedence se-date of his breef commission. Bravet command entiting an officer to hold me within the limits of any country during a many officers of an interior grade in one rank as incid officers in the lunking many Bash: Buzouks during the Crimean wat.

BREVIARY, bre' vid-re (Ir brevaure), in the the daily service book of the Church of Rome ti m its being an al breviated compilation looks anciently us d in the service 16 is matine, prime, tierce, sext, none, vespers, mail of David, "beven times a day will I press whences to sometimes called Horz Compaign hours Originally the breviary contained Lords Prayer and the psalms which were a divine offic s, and to which were subseque lessons out of the Scriptures, in order to dive RETVICE Various additions were subsequent by several of the pepes, with lives of saints, ing with may robable legends. This gave occur number of subsequent revisions, particularly by ocuncils of Tree t and Coloque, and popes Greener Nucleons III, Clement VIII, and Orban VIII likewise by some cardinals. At first the obligation reading the breviery every day was universal degrees it came to be limited to the benefice al me, who are bound to do it on pain of being of m rtal sin and of refunding their resemble in

portion to their deluquencies

BREVIIR bre rer', a small kind of printing type called probably, from its having been first in printing breviaits or perhaps to may have been de-rived from the Latin breus, short, on account of its comparative smalness

EBENT MANU bis m mai au (Lat , by shout hand), is an expression used in Scotslaw to denote the performance of an art by a party on bisown authority, without high intervention. Thus it was anciently the precises in Scotlind for an heistalle proprietor on his own authority to pound a tenant's movables for payment

of his rent, without an application to any judge.

Buivithnis, brev's pen nes (Lat. abort-minged).

Litru applied to several birds of Cuvier's order of Grall dores Lieur wangs are too short to enable them to fly, but are useful as an assistance in running. to by, the are massive, and the muscles of the thighs and limbs are enormously thick, and they are generally able to run with great rapidity. The ostrich, easily and creamany belong to the brevipennes, and the granter Innovins, and other lossed birds, belonged to the same class. All the brevipennes shunths presence of man, and generally inhabit desolate and solitary localities. Many of them, such as the end and case wars, are becoming very rare. The extend Dodo

bel nged to the same order.

Brewine, boo ing (Sax brewan, to brew).--Brewmg is the act of extracting a saccharine solution from grain, and afterwards partially converting the sugar formed into alcohol. The act of making learner to the converting the sugar formed by Herodotus, and, Bes senturies later, by facilities. Brewing is really a chamical operation and the later have the improved by the annalise is man surver was from a.10,000 to 2...0 000, last next bereath have cost a vinular sum in the last press have cost as a sinular sum in the last press have cost as a sinular sum in the last press have cost as a sinular sum in the last press have cost as a sinular sum in the last press have cost as a sinular sum in the last press and contains only a Rank, a kind of promotion in the army by the last press of the coreals, the last press seem to have discovered that fact at a very pressive and contain a large quantity of starch; and when they begin to germinate, a

and swells up; the ing the excellence of ananing in the trough for about drained off, and the grain is oor. It hes in a heap, or couch as it is ix hours. During this time more of iter drams away, and the grain rises in temperature. This is caused by water grame to be in temperature. This is caused by semination of the barley. A primitive transparent of appear. This process tle rootlets begin to appear mee revelues vegin to appear. This process ally called "aweating" and as soon as the by fises high enough, the partial germination by a process called "ficbring." The warm long the floor to a depth of 15 inches. s opposed along the moor to a nepth of 17 inches, expensionly turned and re furned with spaces larger space, until the layer is only six inches after undergoing this process in which the status their greatest length the grain is in the status their greatest length the grain is in the status that appropriate the public of writing and submitted to various as hose appropriate to be outlined from the status of the status o of heat, according to the qual it of malt re-It they are afterwards separated from the of malt, known under the names of pale, and brown, can be produced from the same hatfley by varying the hiat of the dring kin the sproduced at the proper temperature, half is slightly scorched and brown mair is 1 to the fall extent that the kin will permit and brown malt is Tamber, or brown mait is selected according as and suppering It was no in his tom to call mix of farce kinds of mait hour. This was very listone to the publican, and a brower named thou invested a beverage which united the fare at beer, ale, and twopenny it was called entire its antire but; and as it was a healt s, nourishing or, very tantable for perfers and wishing men, the malt rey suitable for perfers and working men, in the name of porter. In browing the malt as six processes.—I the grinding 2 the periodisms with hot water, 3 the boiling of with hops, 4 the coding, 5 the ferment fibe searing, storing, &c. In the first process a malt is ground into a coarse product. When es six process dried mait is ground into a coarse in wher When the undergoing the second of eration, namely, sag with hot water This is conducted in a se, called a mash tan, made with woolen hoops. Water previous v heated to 1/19 copper, is run into this mash tun and the this shaken into it until there is sufficient to vols of the water, when thorou, hilv stirred with long poles or with stirrers worked by Disstace, which was slightly formed during of fermentation, is at this period of the is rapidly converted into grape sugar there of the water falls to 140° Fahr , a fresh ter, at 190° Fahr , is a ided to the mir remaining from two to three hours on the seed cailed an underluck This rup he first mash, and the tun is filled up supply of hot water, called the second mashes are afterwards run together is in the underback are called the sweet to brew a definite quality of beer, it the beaver should prepare his worts the prepare. The quentity of saccharine a special by means of an instrumeer, minitur in principle to the to the proper strength, they are

into vate, or casked into compilete the operation is effected by adding to the dussolved in acid beer. explain the arrangement of the in a porter brewers on the er, it must be observed that XXIII ) us in a great dogree imaging up in which it is taken, but th arranged so as to explain their us at the same time, to preserve, sa to the relative positions which are that each in works of this description. servi e of the brewery is stored in tag mait lofts, usually situated in the upper buildings Of these we have only been able buildings Of these we have only been able to one at A Piate A MII, the others, which are to be on each sule of it, cannot be seen in Immediately beneath the granary A is the upper floor of which are two pairs of brusing or crushing the grains of the a floor beneath the rollers are the milistories the malt is ground, instead of the sin which it requires by passing beneath the soil mait when prepared is conveyed by a trou thest (d), from which it can be elevated, b of a spiral screw, into the large chest of ground mait, situated immediately over th tun D The mait is reserved in the bin til and it is then let down into the machin the extract is obtained by hit water supplied The water for the service of the is obtained from the well F by a lifting page by the steam engine, and the forcing page pump coveys the water up to the larg water back I, placed at the top of the eng from this distern from pipes are laid to the sand also every part of the establishment w water can be winted for clean ng and wa vessels The copper Grean's filled with a byes aply burning a cock and the water wi therea is conveyed by the pipe g usto the it is intr fur il beneath a false bott which the malt her and, rising up through t therein, it extre is the sac harms matter & malt, a greater or less time being allowed for the The in tion according to circumstances water is drawn off from the copper, fresh we be let into it, in order to be boiled read; second mashing, because the copper must no empty for a moment, otherwise the inten tie fire would melt the bottom During to of mashing the mult is agitated in the expose every part to the action of the war done by a machine contained within the m put in motion by the horizontal shall H. When the masting is finished the mill extract is drained down from the mult (I) of sumber dimensions to the mash-tun, immediately beneath, from which it is on Here the wort does not rema necessary to drain off the whole of it ! shove It is then pumped up by the the pump k into the pan at the top of the pupe, which cannot be shown in the pix reins us in the copper pan uptil the w ceeding mashes is discharged from t this waiting is no loss of time, became copper, and the steam aroung from which had become cooler, ready matent the copper is empty, the we the pan into the copper, and the passences rules be the proper proportion of hope in a time proper proportion of hope in a time proper strength, they are copper through the near hote; the time proper into a covered boiler, down and served fast, to keep in the serve time, together with a it to rise up through the proper time.

K. which is a vessel of to contain it, and provided with an plates periorated with small a the wort drains off and leaves wort is drawn off from the jackmy trans and wort is drawn oil from the jack-transh the pipe h, by the three-barrelled pump, here it the to the coolers L, this pump being like diffusing pipes and cocks of communica-series all the purposes of the brewery, except watering the cold water from the well. The full are very shallow vessels built over one the cold water from the well. The full are very shallow vessels built over one the the cold water from the well. The which they are contained is built with open work on all sides, to admit the free current of hen the wort is sufficiently cooled to be put to first fermentation, it is conducted in pipes from the different coolers to the large fermenting vessel yes the M. shich, with another similar vessel be it, is all sufficient expacity to contain all the beer in day's browing. When the first termentation is indeed, the beer is drawn off from the great terconsis M into the small fermenting casks N, there are a great number in the brewer, They placed four together, and thea himr a common The provided to earry oil the pear and conduct and the troughe (n) placed b neath. In these siting results the boar tending the framental acquisition and at the framental acquisition, and at the put into the sixe where it is kept till wanted, and then drawn off into an immense size. barrels and sent out from the brewery. The stre comon figure, and are of different dimens us, from fitness to forty fert diameter and usually twents feet in death. The steam-engine which juts all the ma-phings in motion is also shown in Plate XXIII. On this again of the large fit-wheel is a bevelled eeg wheel, which turns another similar wheel up in the cud of a horisontal shaft which extends from the engine house horisontial shaft which extends from the engine haus to the great horne-wheel, which it turns to means of a cog-wheel. The horse which puts in motion all the pinnens for the miliatones be, and also the herizontal axis which works the ture barrelled pump k. The rullers a care turnel by a herelled which upon the numer and of the ares of the horse which, which is continued for that purpose, and the horse the numerical shaft if for the meahing-inguise, which is driven by a pate of hereight which is the resulted wheels. For each less was a sack tackles which the translation of the statement of the statement of the same of the s pair of spreaker where increase however a same conver-which a pair represented. It is a machine to drawing up the same of mair to the highest part of the louding, where a this same are wended on a truck to be made and the contents of the sacks are thrown in Should any unforcessen securious that he are not the household beonous any autoroseen accident happen to the stransanging, spries any se put onto the horsewheel, but this is an controvence which may be and never to happen in these days of improved machinery. Plate XXIV, is a respectantion of the formenting house of Massen, Whiterest and Company's brewers in Cus well Scarset; the whole of the figure is to be considered as derected by the same object as the large reach Mandaland. ad to the same object as the large vessel M, chals N, Plate XXIII. In Plate XXIV, the which leads in in the different cookies the west to the great formenting versels which there are two, one behind or when there are two, one commu-corresants a part of the great pape of the water from the well b, Plate the water-outern F. This pipe is ted up the wall of the fermenting , and has a cock in it near Just beneath this passage a age, start beneath this parsage a second and enters a large pipe (x), or pape within it. Exper the and of the squares M, another branch d returns to the original pipe f, with the Che object of this arrangement

with the lated at pleasure, so as to have a hast of the wort when it enters into he first fermentation in the squares M beer is drawn off from them by pipes conducted by its branches se to the di fermenting-tuns marked NN, which fill all Between every two rows are placed large contain the yeast which they throw off, shows that the small tune are all places level than the bottom of the great vessels the beer will flow into them, and, by stands all, will fill them to the same level; wh filled, the communication-cook is shut; working off of the yeast diminishes the quan in each vessel, it is necessary to fill them For this purpose the two large vate O O are fi the great vessels M before any beer is drawn the small casks N, and this quantity of beer in at the higher level for filling up. The two v The two vi we have been obliged to place them so that the scen Near each illing-up tun (a) is a custern a pape of commune stion from the tun (), as is closed by a float valve. The small custers always a communication with the paper lead to the small fermenting-vessels N; and fire the surface of the beer in all the twa in the eisterns will always be at the same level as the level subside a better as this level submid a by the working off of the from the tuns, the float sinks, and opens the value to admit a sufficient quantity of beer free in ng up tune (a) to restore the surface of the his all the tuns, and also in the custom f, to the original head. In order to carry off the yeast which is part

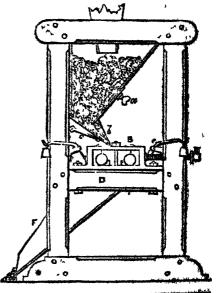


Fig. 1.

duced by the fermentation of the beer in the tune Q Q, as iron dish or vessel is made to float upon the surface of the beer which they contain, and from the senter

## Brewing

of this dish a pipe (c) descends, and passes through round by the whosle F.F., or by any other means, it the hottom of the typ. being filled through a collar of raises up the mait from the hot d, and delivers it leather, so as to be light at the same time that it is at at the apout G. These is hardly a substance seld liberty to slide down as the surface of the hear descends which, is more frequently adultimated than bear in the tim. The years flows over the adpend that disk, Large quantities of quarta are annually imported for and is covered down the spire to a trough beneath the formenting house are large arched vaults facture of picter als. Adultation of bear has of late

## Bribery

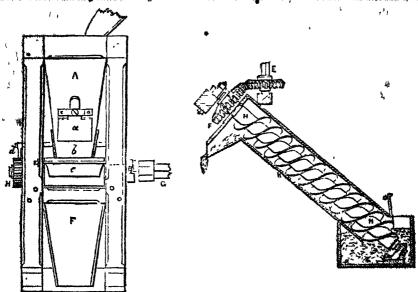


Fig. 2.

(P), built of stone and lined with afuces. Into these become so systematized, that there are men who make the beer is let down when sufficiently fermented, and strength of beet-doctoring. Amonosi the humis kept tall wanted. These vaults are used at Mesers Whitbread's brewery, instead of the great store-vate of which we have already spoken, and are its some temperate preferable, because they preserve a great speakity of temperature, being beneath the surface of the sarth. Figs. 1 and 2 represent the multicilers, or machine for bruising the grains of muit. A is the bopper into which the malt is let down from the maitioft store, and from this the malt is let out gradually through a sluice or sliding-shutt's (a), and falls between the rollers B, D. A screw (E) is lapped through the end of each of the mon frames which is cave the rollers, and by these scraws the rollers may be made to wors closer to each other, so as to bruse the mait 'u a greater degree. G is the shaft by which one of these rolless is burned, and the other receives its motion by Bixed at the apposite ends of each of the rollers. d is a small lever which bears upon the teeth of one of Same cog wheels, and is thereby lifted up every time a cog passes. This lever is fixed on the extremity of an axis which passes across the wooden frame, and in

a regular trade of beer-doctoring. Amongst the hundreds of nugledients used for this purpose may be reckoned quasas, gent in, and wormwood, to give bitterness, ginger, orange-peel, and caraway, to impart pungency; alum and blue vitriol, to enable the beer to preserve a froth; head; cocculus indicus, aux vomes, and tobacco, to intoxicate; and salt, so promote thirst. Tome-brewing is very much certified on in England, and the processis employed are smiler to those described, the apparatus employed, however, as simpler, and often very rough. Many other countries, and Bavaria in particular, brew in different manners,

and from different substances.

HRIBERY, brider ce (from Goth, bry fix, Sax. bredfix, a bribe), that is, a perverting the or gift, something added to the simple demands of justice, with a riew to influence its decisions, a boon to prevent honesty, given to the worthless in high places. (See "Minutes of Fudence before the House of Commons," art Irish Magistracy.) The Glossey to mons," art Irish Magneracy.) The Glossary to Chaucer explains bribone as a thief, bribon, to decoy; while a bribe is probably what is given to a began, what is given to a began, what is given to an extortioner or olsest. To bribe is to corrupt by gifts, to hire; bribery, the crime of giving or taking rewards for evil practices. Bribone in some of our old statutes signifies one that pillers other nien's givids. (28 Edward II. o. 2.) Rethery is an offence against public pusition, and is committed when a judge, or they preson cohorenced in the administration. as axis which passes across the wooden frame, and in the indicate the probability what is given to a began, as axis which passes across the wooden frame, and in the indicate of it has a lever (c, ii., 1) bearing up a trough (c), which hangs under the opening of the frame of giving or taking rewards for evil practices. Bribour longer A. By this means the trough b is constantly longer, and shakes down the malt regularly from the chapter A. It is the lower hand of the men's glode. (28 Edward II. o. 2.) Reliber is hopper A. It is a liver on the rollers e is a notificate against the surface of the roller by a weight, to remove the grisses which adhere to the roller. Fig. 3 is the access by which adhere to the roller. Fig. 3 is the latter of the roller by a weight, to remove the grisses which adhere to the roller. Fig. 3 is the latter of the roller by a weight, to remove the grisses which adhere to the roller. Fig. 3 is the latter of the surface of the roller by a weight, to remove the ground or brunsed malt is reased to petition any superior for justice, not excepting there is no obligation from the superior from the street of the ground that there is no obligations from the superior from the superior from the lower part of the inside of the contrained that there is no obligations from the superior from the superior from the lower part of the inside of the contrained that there is no obligations from the superior from the lower part of the inside of the contrained that there is no obligations from the superior from the superior for inside the first of the surface of the surface.

selling a man's rote in the senate or other public as setting a man's rote in the senses of diam' processes assembly, as for the bestering of common justice, yet, by a strange indulgence in one instance, it tankly encouraged this practice, allowing the magintains is receive small presents, provided they did not in the whole streed one hundred crowns in the year, not whole exceed one insuficed arows in the year, not considering the insulating nature and gigantic progress of this vice, when ones admitted. Plate, therefore, more wisely, in his ideal republic (De Leg. 1, 12), orders those who take presents for design their duty to be punished in the severest manner; and, by the laws of Athens, he that offered was also prosecuted, as well as he who received a bribe.—(Pott. Antiq, h. 1; c. 23.) In England this offence of taking bribes is punished, in inferior officers, with fine and imprisonment; and in those who offer a bribe, though not taken, the same. But in indees, especially the not taken, the same. But m judges, especially the superior ones, it has been always looked upon as so hemous an offence, that Thomas de Wayland was banished in 1288, and William de Thorpo, chief justice of the King's Bench, was sentenced to be hanged for it in the reign of Edward III. Blackstone says he was actually hanged, but Lord Coke (3 Inst. 145) denies that he was or could be hanged for this offence, though he was certainly condemned to this punishment; and the cites the parliament rolls, 10 Ric. II. 24, to show that he was then purdoned and restored to all his lands, By a statute of Henry IV. all judges and officers of the king convicted of bribery were to forfeit treble the bribs, be punished at the king's will, and be discharged from the king's service for ever; and some notable examples have been made in parliament of persons in the highest stations, and otherwise very eminent and able, but contaminated with this sordid vice. Lord (Bacon) Viscount St. Albans, lord high chancellor, was fixed £40,000, and sent to the Tower, declared incapable of any office or employment in the state or within the verge of the court; but part of the sentence was afterwards remitted. Mr. Walpole, secretary at war, was sent to the Tower in 1712; and Lord Strang-ford, in 1784, was asspended from voting in the Irish House of Lords for soliciting a bribe.—Ref. Blackstone's Commentaries, by Stephen, vol. iv. b. 6, c. 9, s. 18; and see Dent. xvi. 19, and 1 Sam. viii 3.

BRIBERY IN ELECTIONS FOR PARLIAMENT.—The

offence of bribery in elections for members of parliament is one at common law, and the offender may be proceeded against by indictment. Besides the Corrupt Practices at Elections Bill (15 & 16 Vict. c. 57), the act 17 & 18 Vict. c. 102, which was passed in 1854, and consolidated and amended the lawerelating to bribery, treating, and undue influence at elections, contains some stringent provisions for securing the freedom of elections. By the latter act, an offender is made guilty of a misdemeanour, and, in addition, liable to forfeit £100 to any person who shall sue for it, if such offender shall, directly or indirectly by himself or any other person on his behalf, give, lend, or agree to give or lead, or offer, promise, or promise to procure, any money or valuable consideration, or any office, place, or employment, to or for any voter, or to or for any person in behalf of any voter or any other person, to induce any voter to vote or refrain from voting, or corruptly do may such act as aforesaid, on account of any voter having voted or refrained from voting at any election, or to or for any person, to induce such person to procure, or endeavour to procure, the return of any person to serve in parliament, or the vote of any voter at any election. The same liability extends to every person who shall, upon or in consequence of any suit, gift, loan, offer, promise, procurement, or agreement, produce, or engage, promise, or endeavour to procure, the return of any person to serve in parliament, or the vote of any voter at any election, or who shall advance or pay, or cause to be paid, any money to or to the use of any other person, with the intent that such money, or any part thereof, shall be expended in bribery to be paid, any money to any person, in discharge or tenayment of any money to any person, in discharge or recognisest of any money wholly or in part expended in bribery at any election. This enactment is, however, mut to extend to any money paid, or agreed to be paid, for or an account of any legal expenses band fide insurred at or concerning any election. And any person

who shall, before or during any elections, directly or midirectly, by himself or by any other person on his behalf, receive, agree, or contract for any name; gift, loan, or valuable consideration, office, pines, or employment, for himself or for any other person, for voting for himself or for any other person, for the person of the consideration, office, pines, or employment, for himself or for any other person directly or indirectly, by himself or by any other person on his behalf, receive any money or valuable consideration, on account of any person having voted or refrained from voting, or having induced any other person to vote or to refrain from voting, shall be guilty of a misdemeanour, and also liable to forfeit 210. See, defines what is undue influence. The member returned through bribery is also liable, upon petition, to be disposessed of his seat. The taint of bribery seems to have affected of his seat. The taint of bribery seems to have affected of exadicate it. The assumed virtue of the House of Commons is from time to time, and frequently at an enormous expense, vaunted and puffed up by most taile proceedings, in the vain attempt to show its incorruptibility; and its vanity has been appeared by an occasional disfranchisement of some poor borough, whereas others of more importance have appeared to defy its power, or have escaped from the effect of its censure. More than a century ago, we find Mr. Justice Blackstone acknowledging and lamenting the extent truly distinguished and sagacious judge has left on record, in his Commentaries, this expression of his censure. More than a century ago, we find Mr. Justice Blackstone where the head of the subjection, which, in all probability, would be much more effectual than administering it only to the electors."

And that eminent and "pright judge, Mr. Justice Coleridge, in his edition of the same Commentaries, her expressed his own opinion thus:—" It is probable that no measure will be effectual till the simple and obvious consuggested by the author be adopte

BRIBER OF OFFICERS.—In the Customs and Excise, officers and persons making collusive seizures, or taking bribes, are, by the 16 & 17 Vict. c. 167, s. 282, liable to a penalty of £500, and incapacitated from serving her Majesty in any office, civil or military; and every person offering the bribe is liable to a penalty of £200. In the court of Chancery, officers taking any fee, gift, gratuity, or emolument, other than what is allowed or directed to be taken by them, are, by 3 & 4 Wm. IV. c. 94, s. 41, liable to a penalty of £500. In Municipal Elections, by 5 & 6 Wm. IV. c. 76, s. 54, if any person who shall have or claim a right to vote in any election of mayor, councillor, auditor, or assessor of any borough, shall sak or take any money, or other reward, by way of gift, loan, or other device, or agree or contract for any money, gift, office, employment, or other reward, to give or forbear to give his vote in any such election; or if any person, by himself or any person to give or ferbear to give his vote in any such election; he shall by any gift or reward, or procure, any person to give or ferbear to give his vote in any such election, he shall, for every such defence, forfeit £50 and costs of suit; and, on being convicted of the offence, shall be disabled from voting in any election in such borough, or in any municipal or partial and shall for ever be disabled to hold, exercise, or enjoy any office or franchise to which he shall be or become entitled as a burgess of such borough; as if he were naturally dead.

were naturally dead.

Bugors, brike (Fr. brique).—The material used in making bricks is clay, which is worked into a plastic state by kneading, and then moulded into a rectangular form, if inches long, if wide, and very nearly 3 inches thick. These pieces are afterwards dried, and then hardened by baking in a kingr in stacks. Bricks have been used in building from a very early period; the tower of Babel was a structure of kiln-baked dricks, and the imposing buildings of Nineveh and Babylon,

Brickwork

reared on huge mounds of many scree in extent, and the pyramids of Egypt, were all built of the same material. The Greeke and Romans also used brioks in many of their public works; and it is probable, from the unceriptions atsamped on those of Babylsn, and the various marks on those of Greece and Rome, that all various marks on these of Greece and Rome, that all were formed in moulds hafter they were hardened by the sun or fire. One peculiarity to be noticed with respect to the Roman bricks, many of which are found in Roman remains in England, is that they are but a little thicker than an ordinary tile, and longer and wider, than ours. Bricks were little used during the medieval period, although it is to this time that we over the interduction of glased bricks for ornamental work. over the introduction of glassed bricks for ornamentus work. For the less 300 years bricks have been extensively used in England, particularly in districts where clay is plentiful, and it is difficult and expensive to produre stone. There are many different kinds of brioks, which may be divided into three classes, as follows:—I. Bricks used for walling; Z. Fire-bricks; and S. Chinkers, or Paving Bricks. There are two and 3. Chikers, or Paving Bricks. There are two methods of burning bricks for walling, and they are accordingly called "kiln-burnt bricks" or "clampboordingly called The latter bricks are the most com-They are made of course stiff clay, which requires sand to be mixed with it to allow it to be worked with facility. These bricks are burnt in clamps or stacks of 500,000 to 1,000,000 in number, with the fuel interspersed among them, that every brick may be tho-roughly exposed to the action of the fire. If the fire is too strong, it causes the bricks to fuse and run together, and form hard irregular masses, called clinkers; but if the fire is not strong enough, the bricks turn out to be soft, and therefore unfit for building purposes. About one-tenth of every clamp is lost by the unequal action of the fire and breakage. When the clamp is sufficiently baked, the bricks are divided into classes, known as "outters," fine close-grained bricks, canses, mown as "outlers," me close-grained bricks, rather sett, and better suited for work in which the bricks require cutting; "picked stocks," bricks of a uniform red tint; "paviours," hard bricks fit for paving; "common stocks," or ordinary bricks; "grizzles," or soft bricks; and "burrs." The bricks also wary in colour, according to the degree of heat to which are exposed. Kiin-baked bricks, also called tim bricks," are made of a finer clay, which con-"malm bricks," are made of a finer clay, which con-tains a considerable quantity of carbonate of lime; for which reason great care is taken to prevent the air getting to the bricks while they are baking, for this would cause the lime to pass into a caustic state; and, when exposed to the action of the atmosphere, it would absorb moisture, which would cause it to swell and burst the brick in pieces. These malms are slowly burst the brick in pieces. These mains are slowly burnt in kilus; they are better for ornamental purposes, being of a pretty buff colour, but they are not so durable as the common bricks. The bricks made of Saffolk clay, which contains a great proportion of carbonate of lime, are nearly white in colour. From 20,000 to 30,000 are taked at once. The best mains come from Erith, in Kent, and Ware, in Hertfordshire. Fire-bricks are made of clay containing a considerable quantity of silicate of alumina, and as free as possible from line, in any form, or iron. The clay is carefully prepared, and the bricks are exposed to an intense heat in kilos, as they are required for building up furnaces, and other purposes, for which it is necessary that they should be able to with and the action of fire. The best fire-bricks are made at Stourbridge, Newcastle, and Edinburgh. Paving bricks are principe, Newcounte, and Edinburgh. Taving bricks are nuite of clay which contains a great amount of silica, that fuses when the bricks are burnt, and causes them to become very hard. Good paving bricks are made at Birmingham and Uppingham, but the best are brought from the Netherlands, made from the mud of the Yssel, and known as Dutch clinkers. Bricks were The I seet, and known as Dutch clinkers. Bricks were originally subject to a tax, which was first imposed in 1781, at the rate of 2s. 0d, per thousand, and increased by degrees to 5s. 10d. Glazed and polished bricks paid dairs at the rate of 12s. 10d, per thousand for those of ordinary mass, and 21. 4s. 2d. for any ones. The duty was sent and in 1850. Batt tracks are made at and acoust stringerwater, of the same of the river Purret, and that a restaurable forms a defined they are monifed into a rectangular form and dried; they are

metal-work. - Red. English Cyclopedia - Arte and

Sciences.

BRICK MARING.—To render the city ill for making bricks of a good quality, it is necessary that it should be dug in the autumn and expected to the air in small heaps, sometimes called "curfs," that the action of the rein and frosts of winter may ripen the clay, rendering it what the workmen call "mellow," and causing it to become more tenacious and plastic after it ting it to become more tensions and plastic after it has undergone the process of knowling. Sand or ashes must be mixed with the clay before knewling, which has the effect of making the bricks stronger, and more durable; the mixture is then worked or kneeded in what is called the "pug-mill," a great improvement what is called the "pug-mill," a great improvement on the old system, by which the clay was knowled by means of the workmen or cattle trampling on it, in a manner similar to the plan adopted for pressing grapes in wine countries, or threshing corn by oran in the East. The pug-mill is a large cylinder, with many arms projecting from the inner side towards the centre, up which a shall passes, from which other arms project, passing between those that are fastened to the sides of the cylinder. These arms, or knives, as they are technically called, are fitted to the cylinder and shaft in such a manner that the clay may be pressed from top to bottom of the machine in a spiral direction by the revolution of the shaft; the material is thrown in at the top, and comes out at the bottom in a state per-fectly fit for the moulder's uso. Formerly, the clay thus kneuded was taken to the moulder in lumps, who fashioned them into the required form by the aid of a wooden box of the proper size, into which, when sprinkled with sand to prevent adhesion, the clay was pressed, and then shaken out, in the shape of a bridge on a board, which sometimes had a projecting piece fastened to it to make a depression in the brick into which the mortar might enter, and so bind the brick-work more closely together. At the present time, however, the operations of keending and moulding are combined, and effected by the same machine. After combined, and elected by the back mast he pig-mill, the clay is discharged into a box, from which it is present by the action of a shaft rising and falling vertically into a mould of the required size; the mouldingframe then slides over an opening in the board which forms the bottom of the mould when under the shaft that fills it, and the brick is pressed out by the descending action of another shaft on a board placed to receive it, from which it is removed by a boy whose duty it is to watch the machine. The bricks are then piled up in such a manner as to leave room for the passage of the air between them, and allowed to dry; they are afterwards removed to a kin for baking, or hardened by burning in stacks with fuel thrown between the successive layers of bricks. The above method of moking bricks by machinery is that introduced by Mesers, Cook and Cunningham about 1840, whose machines will turn out about 1,800 bricks an hour. There are, however, many about 1,500 erics an nour. There are, nowers, many other machines, differing slightly in principle of action from that which has been described, and tarmore complicated in construction; among which may be manned that of Mesers, Heaton, of Birmingham, in which the bricks are made in metal moulds revolving on a wheel, and pass through successive stages of formation during the revolution, until the brick comes from the mould perfectly formed and ready for removal; that of M. Terrason, in which the clay is pressed into long troughs of the width and theichness of a brick, and cut, when discharged from the troughs, into pieces of the regulsite length by a frame, across which wires are stretched suc leaght by a rame, across which were are arrectaged, to effect the cutting process, after which the bricks are conveyed by machinery acting on an inclined plane to any desired distance, for stacking, drying, and burning; and that of Mr. Jones, in which the clay is mixed. to a stiffer consistency, and therefore requires less rine for drving when formed into bricks. There is time for drying when formed into bricks. There is also a method, originated by Mr. Prosser, of turning out bricks almost dry from metal moulds, in which the clay has been subjected to very great pressure. Ber. English Cyclopædiu. Arts and Sciences.

BRICKWORK .- The thickness of walls of houses built or brick is regulated by the length of the brick, which is nine inches; walls, therefore, are spoken of as being is nine inches; walls, therefore, are spoken of as being half a brick, a brick, a brick and a half, &c., in thickness. In houses, generally, the outer wells are from

### Brickwork

ens brick to two in thickness, and the partition walls only half a brick thick. In public buildings, and walls in which great strength is rangifired, they are sometimes more than four bricks thick; but it is considered good substantial work when they are made of the thickness of three bricks well bonded together. Garden walls are half a brick or a brick in thickness; they are often strengthened by the addition of piers, about 10 or 12 feet apart, and about 18 inches in width, projecting at inches or 0 inches from the face of the wall; they are fluished with a coping of bricks laid on the side. In loose soil it is necessary to form a foundation for the wall by filling a deep trench with atone and rabbish, which is often cemented together with concrete. In bricklering, care must be taken that the bricks are well-bonded, that its, that the successive layers of bricks mysig, once must be seen that it is the successive layers of bricks may be so placed that no joint in any layer shall come mendiately over snother joint in the layer below it. Bach layer of bricks is called "a course." When bricks are laid with the side facing outwards, and lengthwise in the course, they are termed stretchers, and the course is called a stretching-course; but when the end appears in the face of the wall, they are called headers, and the course a heading-course. four principal methods of bonding bricks together, called English bond, Flemish bond, herring bond, and English bond consists of stretching garden bond. courses and heading-courses alternately; Flomish bond courses and resulting courses afternately; riemian nond, in laying a stretcher and header alternately in each course. Herring bond is used for the core of thick walls, alternate courses of bricks being laid between the outer and inner laces diagonally, at an angle of 45° to the face, each course being also laid in an opposite divection to that on which it rest: this leaves site direction to that on which it rests; this leaves triangular aps ses between the core and the face of the is supposed to give strength to walls the but it faces of which are built on the principle of the Flemish bond; hoop iron is sometimes laid between the courses of Flemish bond to give strength to the wall and tie it together. Garden bond consists of three stretchers and a header in every course : it is only used for walls of the thickness of one brick. Arches of brickwork are always constructed on wooden centring, which is afterwards removed. The formation of groined work, or the intersection of arches in a vault, with bricks, is difrme incersection or arches in a vaor, with threes, is dif-ficult, as in this, as well as in every other kind of arch, elliptical, segmental, and straight, except those that are senticircular in form, every brick has to be bevelled at a different angle to it the curve of the arch. The brickle are cut by the bricklawer to the required shape by the brick-are, and are afterwards brought to an even surface by rubbing on the "banker," or rubbing-table. Nest workmanship is required in shaping and putting together the bricks in any kind of arch. That the settlement of brick walls may be the same in all parts, they should be built up to the same level in all parts at once. Mortar, made of lime and sand, is used for comenting brickwork together; twice as much sand as lime is the proportion generally used in the composition of mortar, rather more being required for mortar made with stone-lime than for that made with chalk-lime. To give a finish to brickwork, it is sometimes pointed with blue or white cement or plaster. When the pointmind one or wine cement or plaster. When the pointing is on a level with the surface of the brickwork, it is called "flat-joint pointing;" when it is raised above it, it is termed "tuck-joint pointing;" the former is generally done in blue mortar, and the latter by adding a raised line of white cement on the surface of the blue morter that is first inserted between the courses. a brick and a helf thick; this will be found to be calculated to be about 15 tons, constituted 4,500 bricks, swighing on an average 10 tons, and 5 tons of mortas, composed of 80 cubic feet of and and half that quantity of chalk lime. Many fine specimens of brickwerk are to be seen in continental cities; the most curious is that in the Marien Kirche in Brauthe most curious is that in the Marien Kirche in Brau-deaburg, in North Prussia. In and near London, Rampton Court, St. James's Square, the Thames Tunnel, the fine warehouses in New Cannon Street, near St. Paul's, and the viaduets of the various railways, may be mentioned as the best examples of Buglish brickwork; and the enormous factory chim- at marriages is a custom of remote antiquity. In the neys in Lancashire, Yorkshire, and about Glasgow, north of England a custom formerly prevailed of the

## Bride and Bridegroom

some of which tower upwards to the height of 460 hat.

—Est Emplish Cynlopedia.—Arts and Sciences; Fichtelson's Dictionary of Architecture.

BEIDS AND BEIDSEROOM, bride, bride'-groom.—
Various derivations have been given of these words.

According to Tooke, bride is the past particulate of the Ang. Sex. verb bredan, to nourish or cherich, and groom the past participle of gyman, to take care of, guard, attend; so that the bride is a woman nourished and of rished, and the bridegroom is one by whom she is at-tended, served, and protected. They denote respectively a newly-married woman and man, married on the first day of their wedded life. The end on the first day of their wedded life. The enjoyment of these titles being necessarily brief, they have always being associated with numerous ceremonies. Among the ancient Greeks the bride was usually conducted to her future home in a chariot drawn by mules, with her husband on one side and his most intimate friend on husband on one side and his most intimate itself on the other, the hridal party forming a procession with torches and singing. On reaching the end of their journey, the axie-tree of the chariot was broken, to signify that she was to remain there. The marriage feast was then celebrated, after which the bride was conducted by the bridegroom to her spartment; where, by the laws of Solon, they were required to est a quince together, while the printal anima, or bridal-gong, was sung by the young men and maids outside. The day after the marriage presents were made to the newly-married couple by their friends. Among the Romans the bride was conducted to the house of the bridegroom by a procession resembling that among the Greeks, bearing in her hands the emblems of diligence,—a distaff and a spindle with wool. She was lifted over the threshold by two married men, and received by the bridgeroom within with fire and water, symbols of partification. The keys of the house were then prese to her, and the ceremonies concluded with a feast, after which she was conducted to her apartment by matrons who had only had one husband, and ministress matricis who had buy had one had the had the hight, and friends sang epithalamia without during the night. Usually there was a pretended seizare and carrying off of the bride from her parents, in memory of the rape of the Sabines. Formerly it was the custom to drink wine in the church after the cup had been first blessed, by the priest; and among the Jews wine-drinking at marriage is still universal, the glass being broken after the bride and bridegroom have partaken of it, to re mind them of the perishableness of all carthly things. The bridal kiss is of unknown antiquity, and is enjoined as an essential part of the marriage ceremony in the old missals long before the "Common Prayer-Book." It was always done in the church, and, at one time liberty to kiss the bride was among the perquisites of the priest. In account times wheat was sprinkled upon the head of the bride, indicative of a hope that the newly-married pair may always be supplied with an abundance of the good things of this life; but in later times the wheat has taken the more presentable shape of a cake. In England and Scotland the cake was formerly broken over the head of the bride, but it now takes the form of a highly-ornamented piece of confectionery. It consists of a rich cake as a basis, surmounted by a light superstructure of various devices, the whole being covered with a preparation of white subors augar. Bride furours are small knots of white ribbons pinned to the breasts of all who are in attendance at weddings, a knot, among the ancient northern nations, being a symbol of love, faith, and friendship : formerly the ribbons were of various colours. The use of bride maids at weddings appears as old as the time of the Anglo-Saxons, among whom, as Strutt informs us, "the bride was led by a matron, who was called the bride's woman, followed by a company of young maidens, who were called the bride's maids." In later times it was among the offices of the bridemaids to lead the bride-groom to church, as it was that of the bridegroom's men to conduct the bride thither. Part of the duties of the bridemaids consisted in dressing and undressing the bride; and the bridegroom's men performed the same offices to the bridegroom. Bridemaids, as mere ceremonious attendants at marriages, are still in use in England, and the bridegroom is usually attended only by one confidential friend. The giving of glores only by one confidential friend. The giving of gloves at marriages is a custom of remore antiquity. In the

young men present at a wedding, immediately after the ceremony, striving who should first plack off the bride's garters from her legs, and whoever were the rictors on this occasion worse them about the church is triumph. Bride size, aride bath, and bride rizke, are nearly synonymous terms, and all derived from the castom of the bride's aciling ale on the wedding day, for which she received, by way of contribution, whatever price the friends assembled chose to pay for it; the expenses of a wedding fear were in this way discharged among the friends and relations of a couple who were not in circumstances to bear it. Somewhat of the against land was the penny wedding, which was of the same kind was the penny wedding, which was formerly not infrequent among the poorer classes of bootland, when the friends of the newly-married pair each contributed a certain sum to the expenses of the feast, and any one might be admitted to it on payment of a certain sum. Flinging the stocking was also among the customs generally observed on the marriage night m Kngland. It consisted in the young men taking the bride's stockings, and the young women those of the bridegroom, and each, sitting at the foot of the bed, threw a stocking over their heads, endeavouring to make it fall upon that of the bride or her spouse; and If the bridegroom's stockings, thrown by the young women, fall upon the bridegroom's head, or those of the bride upon her head, it was taken as a sign that they themselves would soon be married. The sack savy unconserves would soon be harried. The sace, posset, too, was also a custom that generally prevailed among our ancestors: it was a kind of caudle, made up of milk, wine, yolks of eggs, sugar, cinnamon, and nutureg, and had to be esten by the newly-married pair after boing put to bed. Among the numerous practical jokes that were not unfrequently put in force on such an occasion was the sewing up the bride in

But, since it must be done, dispatch and sowe Up in a sheet your bride."

Hesperides.

BRIDEWELL, bride'-well, denotes, generally, a house correction. The name is derived from St. Bride's of correction. The name is derived from St. Bride's Well, in Blackfriars, London, which was anciently much resorted to by pilgrims, and on the site of which an hospital was founded by Edward VI. in 1553. It was given over to the city of London to be used as a state of the city of London to be used as a of correction. workings for the poor, and a house of correction for the ide and vagrant. It afterwards came to be used as a place of punishment for criminals. As belonging to the city of London, it is under the control of the

lord mayor, and not under the sheriff.

Bridge, bridj (Sax. brigge; Ger. brücke).—A structure of wood, stone, or iron, thrown across a river, or any channel in which water flows, for the transit of sengers and goods from one side to the other, or over a railway, to carry a roadway above it at a higher level. Bridges thrown across a valley for the purpose of conveying water are called aqueducts (see Aqua-puct), and those for carrying a railway or roadway over a ralley are called viaducts (see VIADUCT). Different terms are given to bridges according to any difference in their construction or difference of purpose. They may be broadly classified as fixed or movable. They may be probaby classified as fixed or movable. Among the fixed bridges are the ordinary bridge, the suspension bridge, the tubular bridge, the frame bridge, the lattice bridge, and the skew bridge, a variety of the ordinary bridge, introduced by modern engineers to allow a railway to pass over a road or river at an angle otherwise than a right angle. or river at an angle otherwise than a right angle, without altering the direction of either, or placing the piers phlerwise than parallel to the direction of the stream (see Suspension, Tenulas, Frame, Latrice, Serw Bridge); and, among movable LATRICE, SERW BRIDGE); and, among movable bridges, are the floating bridge, flying bridge, draw-bridge, and swing-bridge. (See Ferry, Floating Bridge, Daawnsidge). Military bridges are of BRIDER, URAWRIDER: MINIST Propes are on an entirely different nature, and are noticed under another head. (See Brider, Ministrany.) The technical terms amployed in bridge-building with regard to the arch will be found under the general description of the arch was Acul; but it must be added, that the must see of masoury erected at either end of the bridge, which generally sustain the thrust of the whole series of anches, are called the abutments; those in the bed the arches soring, the piers: of the stream, from which the arches spring, the piers;

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and the filling in between the top of the arches and th and the filling in between the top of the arches and the roadway, the spanfil. It may also be remarked that the term arch is applied to the structure of that form when made of stone, brick, or east iron; while, in bridges of wood and wronght iron; is in called the bay. The bridges of the ancients appear to have been claim-sily and unskilfully made of broad stones or planks reating on perpendicular piers, sithough they were that to construct efficient temperary bridges for the transportation of large bodies of troops ecross rivers and pieces of water of considerable breach, seevinged in the passage of the Hellespont by Zerres, 480 p.c. when he led across an immense army of Persians and auxiliary troops for the invasion of Greece. Bridges about Rome were made of wood, even sher the Clo Maxima, or great sewer of Rome, had been ancessed arched over. The famous wooden bridge that Horatius Cocles so bravely defended when Lars Possens menaced Rome, was made of wood; and it app that the earliest known bridge of stone over the Tiber, and, perhaps, the first stone bridge ever built, was the Pons Senatorius, now the Ponte Rotto, built by C. Flavius Scipio, 127 B.O.; but in later ages, the magnificent bridges and viaducts built under the Cassars in various parts of the empire, give the Roman people the credit of having introduced the art of bridge-building into Europe, and, indeed, show them to have been the originators of the art with respect to the application of the arch to such a purpose, although the Chinese claim to have constructed arched bridges at a far earlier period, which is a matter of doubt, owing to the un-certainty that exists with regard to the truth of their chronological records. Among the numerous bridges built by the Romans may be mentioned that which was erected by Trajan over the Danube, consisting of twenty semicircular arches, with a span of 180 feet, springing from abutments 64 feet wide and 85 feet thick, at a beight of 46 feet above the surface of the giver. This height of 46 feet above the surface of the river. bridge no longer exists, having been destroyed by Hadrian to prevent the Dacians from using it as a means of making incursions on the Roman territory. With the decime of the Roman empire, bridge-building was neglected until the time of Charlemagne, who mast tuted a society known as the order of the Frees du Pont, or Brethren of the Bridge, whose duty it was to see to the erection and repairs of bridges and the establishment of ferries in various parts of France and Germany, among whose earliest works are reckoned the bridge of Avignor, over the Rhone, and that of Ratisbon. A fresh impulse was given to bridge-building in France by the establishment of the corps of the Ponts et Chausses, about 1720, who built the Pont de la Concorde at Paris, and many other notable bridges at Blois, Cricans, and Saumur, and in various parts of the country. In England, the first stone bridge built the country. In England, the first stone bridge built was that of Bow, near Stratford, in 1037, followed by old London Bridge, in 1176. Old Westminster Bridge completed in 1750, was once considered the finest in the world; but it is surpassed by the new structure which has been erected in its place. In 1775, Mr. Pritchard, of Shrewsbury, commenced the construction of cast-iron bridges by putting up one at Coal-brookdale; and this example of the adaptation of iron-work to the formation of bridges was followed by Wilson, of Sunderland, and Telford. Since the commencement of the present century, the art of bridge-building has rapidly developed itself under the requirements produced by the introduction of railways and the increased facilities of locomotion, and the result is shown in the new forms of the suspension bridge, the wrought-iron girder bridge, the lattice bridge, and the tabular bridge, as exemplified in the Menai and Cheisea. suspension bridges, the High Level Bridge at Mew-custle, and the Britanuis, Conway, and Selfash tutulage bridges, the last named of which is also known as the Albert Bridge. The bridge over the Delaware at Trenton, in America, and the Niagara suspension bridge are also magnificent bridges, and the Victoria Bridge over the St. Lawrence, in Canada, is the largest tutular bridge in the world. There are many noming tubular bridge in the world. There are many points of great importance to be considered before designing and commencing the construction of a bridge across any piece of water, and the form and nature of the bridge should depend mainly on the results derived from a careful inquiry into these points. For instance,

a slow, singgish stream, flowing through a dist country at the rate of a lettle mane than a grantee of a mile year hour, would not require a budge with high mears and letty arches with a broad grant as grant against the sudden rest of a least stage, which would carry down large trees and accompanies wasses of differed, that might stick fast under or against the bridge and prove the means of the destruction; or the other hand, a bridge of this sometraphon would be absolutely secsion; for a rated river destring its supply from a waterabed of many miles as superficial extent, and flowing between steen banks. The pounts, then, to be first considered, are the extent of waterway that is necessary, and she form that the bridge should take with reference to the character of the stream. The extent of waterway depends on the superficial extent, shape, and gradges formation of the country that field the river over which the withrough lands of a posque or sandy nature, in which the volume hand or a posque or sandy nature, in which the volume a clow, alugush stream, flowing through a flat country lands of a possess or sandy nature, in which the volume of water passing under is subject to little variation, require buy little waterway, while those which run through land which is steep and hilly in character, sarough same where is accept and they in character, and costains underlying strate of granite, innestone, and slate, or heds of thick clay and loam, which will not absorb any surplus till of ram, require a waterway of cognidarable actent. Thus under the former conditions, the waterway of a bridge would not require a greater depth than one not for every square mile of ground that supplies the river that passes under it, while in sountries where the ground is very steep and mountainous, the strate non absorbent, and the rains beavy and frequent, producing sudden floods, a water-way equivalent to four feet and a halt per square mile of watershed strequeste It must be remembered that these dimensions form the opposite extremes of a scale, or the greatest and least depth of waterway re scale, or the greatest and least depth of waternay required per square mile, a c rding to circumstances and that, aithough a sufficient amount of waternay would be secured in the case where the depth allowed is of such narrow limits, tradges are solden built, symmin flat country a such as Holland, with an small ay allowance for depth, or in mountainous and builty districts with so much Next in importance to the waterway is the character of the stream, its average velocity and liability to sudden increase must be ascertained before determining the number and strength of the piers to be placed in the bed of the river of the piers to be olaced in the hed of the river. The piers will naturally tond to diminish the breasth of claimed through which the waters pies, causing an accumulation of the water in mediately above the bridge, and, in consequence of the au increase of velocity below. The fewer the number of piers the briter in all rases, particularly in briging rivers which flow at the rate of three mits per hour and upwards as is the case with rivers that run over shingly and rocky strains. The required amount of waterway and the objective of the strain. the rigranter of the stream having been ascritained, the purpose for which the bridge is intended to serve. the weight the piers an larches will have to bear and the weight the piers and arther will live to being and the taken into account as the form and method of construction to be adopted in building these parts of the bridge mainly depend on these points. It is an invariable rule that the piers should rise at least as high, or a little higher, than the level attained by the water of the triver when swellen his a hieray flood rishing from the uplands, this will effectually prevent the water from rising at any time as high as the keystone of the arrely, which will mater ally affect the stability of the bridge. They must also be constructed of a sociating in proportion to the time of the current, and the weight they must ustain in a vertical direction, as they are not intended to support the lateral thrust of the arches, which is generally directed, in the case of bridges of great lend the through the entire arrives against the missine shutments at the ades After securing proper foundations for the abutments and places, which often have to be made of masses of a sidd massagey or concrete (see Concrete, Corpertuly, within elements in low the bed of the preve, owing to the nature of the soil and the geological formation undernessin, the nature mu t be taken into account as the form and method of

These weights will m resolve a destructive pressure on the elec-sless; and it must be the care of the engine trust them of sufficient size and strength: Street them of sufficient size and strength to be a successive should apply them at every soint, and insure the steining of the bridge. It collections weight of the place of and per equate foot a made for ordinary bridges, 800 lbs. For railway bridges; the weights of the aparts are found by calculations based on the accrement of the same With regard to the severted by the strength of the current against the mean velocity of the water and the superficult the mean velocity of the water and the superficult and the protected against the rash of the owners should be protected against the rash of the owners. of the end of the pier exposed to its action. The piers should be protected against the rush of the emrical by the addition of what are called cuprature, which are pieces of masonry the horizontal section of which is an equilateral triangle, projecting from the andle of the piers in the form and exercising the functions of a wedge, which divide the water in its compa, and thereby materially it seen the momentum with which it comes against them In non-tidal rivers, out need only be placed on that side of the give which is opposed to the direction of the wreem, but in side in the total control of the wreem, but in side in the total control of the wreem, but in side in the repeat to the form of the arch to be employed, an alliquisid of segmental arch is most degant in appearance, particularly cularly a segmental arch, which is one with of the circumference of a circle, subtending an angle of 50°, in which the versed sine is exactly equal to ene-fourth of the span In segmental arcnes the lateral thruit on of the span In segmental arenes the lateral taries of the abunents is greater than in any other form; but as the vousions forming an arch on this construction can all be cut from the same mould, as well as those of the same incular arch, there can be erected at less explains than an elliptical arch. But when the semicircular form is used, unless the banks of the river by warrenest that the approaches to the bridge are such as the contract the deduction. warrant its adoption, the roadway must necessaril kept at a considerable height above the level of water, particularly if the water in the river be subject to great increase after heavy rains, as the pars must be rai cd above the level of the flood-line. The following bridges in various parts of Great Britain and Ireland afford good examples of such construct Ireland afford good examples of such constructions with elliptical, semicircular, and segmental archiva. I lipitual — London Bridge, Blackfeiner Bridge, Waterloo Bridge and Limerick Bridge Semicircular in Strekport Bridge and Limerick Bridge Semicircular in Strekport Bridge and True viaduots. Segmental — Cherter, Coldstream, Glasgow, Towkesbury, and Vauxball Lindges, with old Rootster Bridge, and the Vale Royal Viaduot the arches of the two structures last named are segments subtending an angle of 1972. A greater extent of stang can be obstructures as a lamed are segments suctending an angle of 60° A greater extent of span can be obtained in suspension and tub ilar bridges, and those constructed with east run griders, than in bridges of masonry or brickwork. The arch of the bridge at Chester which is 20) feet a span, with a ruse arresped sine of \$2 feet, is perhaps the largest built of stone in this country. In building bridges of stone or brighwork the engineer has to exercise great care in the construction of the centre or wooden framing on which the aich is built (See Critzine) The principal requirements for a centre are that it should be well braced together with cross tunbers, to avoid any dis-placement of the truses laterally, that it should be exactly summar in outline to the curve proposed for the intra los, or line formed by the lower ends of the vous-soirs of which the arch is composed, allowance being sours of which the arch is composed, allowance being made for the compression of the wooden frame under the heavy weight that is to be piled upon it, and that it should be supported in such a manner that it can be easily removed without injury to the arch at can be easily removed without injury to the arch as soon as the masonry is completed. The common plan is to support the centring on we iges, which are driven out when the stemeowerk is function; but the French have adouted a plan of waiting it on pandhear, which was he adopted a plan of resting it on sandbags, which can be easily removed without causing any ribrasion in the the fresh masonry, which must be produced, and often with serious migray to the work, where the wedges are struck out by blows of a handner. Wooden bridges are often used instead of stone 12 countries such as ne tow the use of the river, owing to the nature of the riven masonry, which must be produced, and other soil and the geological formation underweith, the next with serious unjury to the wolk, where the usedges are thing will be to calculate the weight of the passing load, atruck out by blows of a handler. Wooden bridges the weight of the superincumhent mass between the arc often used instead of stone in contrives such as crowns of the archae and the readway, and the weight of. America, where timber is cheap, but they are liable

as simple as possible in to throw the pressure foundations or supports y should be made with due e and proper halance of the pressure which they are exposed (See Cas-) Iron bridges are of various kinds, a already stated, suspension, lattice, Bridges of metal are liable to contraction under the influence of heat at allowance can always be made for this in adifferent parts of which they are composed in the support to throw a straight bridge over a without having recourse to the support of without having recourse to the support of parsecularly in the metrop his and its sur of subarbs, pirders of cast hou may be used by space to be bridged over does not exceed bots when it is more than the to the when it is more than this recourse should to wrought-iron girdeis. When an arch defines derable span is made of iron, east iron se it is capable of resisting great compression h itself is composed of several acparate cast "consecurs, which are put tog ther in the cur of a segment of a circle Scuthwark for ige Tankhall and new R scheeter bridge and Laira m meas Plymouth The splendid budge ver the nest examples ( ta stone bridge in existence the structure consists of more clips at at hes of 120 feet span, and to feet use. The poly are states, the road 2N ict wide, besides a fun dulk of large blocks of grantle with short coulder has ever each pier, the haunches, as is usual in the man with a bridges by spandrils or incitudinal walls wingsred with flut at mes an I extending ever if the span of the arch the 1 mainder being devered with earth or gravel which is also con down the stones covering the spandule Inc office spaces between the walls are carefully clean! bosses and provided with outlets below in order t come them from becoming receptual a twater which accord with the archite time I the Houses of which he isplaned so the durability of the structure man and consets the pennings. The first a manual specific grants of the materials is such that of a haid is absent to pass with a rise of the grant of the grants weight casely two tons, of from 1 mill turn to see and 105 too, with a million work one ton, and of the earth a ton and an 17 feet bandes the thir if 1 if 2 miles, we haid to the set and the first and the contracts. ments. Hence the wright of the whole may be ob

	Culne feet
Half of the arch stones	. 25 311
Helf of the inverted arch	2,5 15
Broate spandri between them	1,994
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E	10,260 = 5,771
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Company cast and west	1,170
william belestrade	510
milit th parapet	. 413
Telepoletra 72, 151 owt	102
Debig date and west	. 143

ad from a consideration of the erials exhibited in the plate, we sh stopp enters the pier is coura-ions \$4,000 subjection of grante, sing in round numbers 13,000, and

that erected By Teleord up called Buildwas This s in the era of from-bridge markable features we therefore at at fig 2. Plate AXVI. The sorthed by Mr Telford in Brew clopedia -" The bearing-ribs in 1 it), or nearly one-eighth of the pending ribs its 34 feet, or about span There are tast from brace as length and 1 meh in thickness. 4 inches in dopth, and are screwed for joint so that by taking the curvature of the sha and hong firmly secured at the abus stead of a lead they compose a strong as being only one rib in the middle of 19 less bridge on each or norms plate, a cross rib or \$ monos in depth is cast at an equal distances but The suspending ribs are each ! bearing tibe in dopth, and two five eightlis of an meh su or the print and the print of the hearing side see 18 in cepts and 2) inches in this hearing side see 18 in cepts and 2) inches in this hearing side see 18 in this cepts only of about 50 feet seed in the cepts of the principal known as the principal kn 10) ly is not the gringing plates are each ? brigaint in a stick with openings to mare no tie un ghis a, met tie shutments are fi inch RG LEFE t to err ngret uprights up the railing are of as square, and those letween them 1 is which, affords a specimen of the combination of with 1 and lurned bricks, which preserve most to the date of the specimen of the combination of with 1 and lurned bricks, which preserve most plant and the property but they are conceiled by 1200 plant and 1 an mase is the alutuumts was excavated drive to the root It was built up chiefly of square mesongy, on foci it was built up chiefly of square masonery, and the rest of ruille land very close in regular course and has up the back part formed in the shape of a weige penting to the bank. The wing walls were cived in resultly in vertically. This bridge, with however middle in regard as which was complete f with a was computed to second to the man, in access, many preceding the first of the monitor with things at measily as increased and in the second from the measurements and the second from the measurement of the second from the second fro accord with the archite tute I the Houses of F penings I be drat arch o en haide se 115 feet at pan with a rune of 18 feet 17 leat 6 inches the thire illy fet 3 inches, with rise of 1) fet and the futh, rentre arch, is 127 feet in spin, with a rise of 2) is the line water field in the feet below Trinity of this feet below Trinity of this feet below Trinity of the first field in a reals two small land at his Judicing these are als two small land at his Judicing these, the width of the life including the deat. The width of the life including the many the same of the life including the life including the same of the life including the same of the life including the the but he may be communicated to a conduct the parameter of the new first or a true ton of the new parameter of the new parameter of the second of the seco width of the lile ande abotes in the on truction of the must r Bridge Me Page avoided the use poster piles worder in ten at out reals of the centre to center to torn the outer line of the iron shrathing was in tridu cil between those to an inciosure, the 1) see ground being next dragged fr within limber piles were then derive in area so in loved at internals of three feet one four feet the other from centre to centres, and en two levers of 6-nch landings and grants of upon these the piers were built, rising two in Trinity datum. 1. received upon these the puers were usuar, range or Frinty dating, t. receive the stea sub-The headway is centre opening to 20 Mars, was rearly level. It was contamped in under contract by Mesers. Mese & Co., 80 2308 489, but a levernouths before the aptook place in the spring of the year I spent upon its construction had reas

Bridge

# UNIVERSAL INFORMATION.

ended, at common has, not safe has beside facile, but to so unters of the road as a sadeduct any ingrees, rathersy, and prometine and or do any ingree with moon, we are appropriately and by stat 23 Hen VIII of the county was resulted to repair three hundred feet other ball be guilty of felony. Rudsim way from the budge. And such is still the state of the bidle be guilty of felony. Rudsim has by to all heidiges built prior to the Highway Act, ment not exceeding two years, we out to be the state of the prior to the fighway Act, ment not exceeding two years, we out to be a finished the read stall passing. In our, and with cr without set when the separated by the parish, or other parties bound without whipping

aquedum,

## LONG SPAN BRIDGES

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" Name of Brings	f tal lighth in feet	,	M of blane	I on per	B' MARES.
Robellbausen, Switzerlaud Trenton, & J	8 (*1	1	1.	195	We ba h Mech Vol II. p. 253. We have truesed Haupt on Fridge to truction p 242
Columbia, Penrayl an a	r s		2	1 200	Burrs - Destroyed during rebel invasion,
Neuark Dyle, Lug		l		211	
I pex, Mass tl. ow lng Nogel, E Prussu	174	,	1	1 5(t 1 5ml	Vann Co. Ing. p. 208 Quen Pat - Theory of Britages Week, Jour Frank Inst. Vol LXXIX, and then,
Upper beharkill Launsille Bridge, over (11 orive Weitingen, Gremay	וו ( נג		.5	316	Intalines R port of Company
Dirachad, Irus a	-11		(		led II, p 81 In a thice lour Frank, Ipst, Val. \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
Numbers, Helland  Derry, designed by thus (never			j	( ) s	If neet synt trussed bridge. Official Right 1, 1800 ir good we den structure. Waishabi Nich, Vol II, p 54
besit).					at n i in Tr'b ox

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Bant (F Baidge.	length in		I year t	Remarks.
Nemily (over Seina) Toll, houth Wales	ucroti n	1 3	12	When, p 225 I died by rising of the grown, Woodbury
London Bridge Rica, Ajr Theatistor Grosvenn	7 = 4	5	1 13	In the Arch, p 433 We adduce p 432 for radical paragrams I me Frank Inst., Vol XXXIII. p. 284.
Cited Washington Aqueduot Southwest			200) 210 210	Mahap, p 228 be tm, 1-80, p 86 Custaren for Russia. Sani as Lives of Magnetics. Full II.
Disers Adda	5 17	1	251	Longest stone and on second. Management
St. Lösis Bridge	1,509	3	515	on Bridges, World, Vol. L. p. 48.
Proposed Bridge over the Thames, by Fellows.	***	1	600	Rep by the Co. 1643.  To be made of jeet. Weighted, we p. 68.

	THE	DICTI	naby	OVI		
Bridge-besi				Bridgewater Treatines		
	**	ubulak 1	BID <b>ays</b> ,			
NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Spen.	Romani		
Convey, Etg Britannik, Etg., A	1,513 4 10,284 25		400 460	Civ. Eng. Journal, 1848. Tubnlar Bridges by Dampsey. Traits of is Construction de Posts Metallique Plate X.		
Victoria, at Montreal, Canada			330	Hunt's Merch. Mag., Vol. XXXI., p. 804 24 spans are each 242 feet.		
	st	SPENSION	DRIDGES.			
NAME OF BRIDGE.	Total length in feet.	No. of Spans.	Longest Span.	Bemares.		
Niagara Carriage Bridge	1 1,264 2,499 1 1,600		1,234	Sc. Am., Vol. XX., p. 218. This bridge about a mile below Ningara Falls.		
Cornwell (proposed to be built across the Hudson river, 42 miles above N.Y. City).			1,600	Journ. Frank. Inst., Vol. LVII., p. 165.		
	When B	wilt.	Span.			
Donro, at Oporto Menai, Eng. St. John's, N.B. Nashville, over Cumberland	1842 1823 1852 1850		558 580 622 656	Sup. to Weale's Bridges, p. 144. Chain cable. Mahan's Civ. Eug., p. 255 Sc. Am., June 19th, 1852. Destroyed by Rebel General Floyd, Feb 1882. Sc. Am., March 30th, 1850.		
Peath, over Danube	1919 1854 1834 1886		670	Total length, 1,250 feet. Jour. Frank, Ins. Vol. XVII., 3rd Series, p. 300.		
Niagara Railroad Bridge			622 870 1,043	Jour. Frank, ust. Ibid., Vol. XXIII., 2nd Series, p. 141. Sc. Am., June 1st, 1861. Blown dow Feb., 1864.		
Lexington and Danville Railroad Bridge.	1850	3	1,220	Jour. Frank. Inst., Vol. XXXIX., Series, p. 230.		
Haat Miver Bridge, N.Y. City			1,600	Proposed, Journal Frank. Inst., V LXXXIV., p. 248.		

structed for the defence of any town, or thrown up instily to secure the retreat of an army across a river, and to enable a small body of defenders to hold the enemy in check until the retreat has been safely effected, and means have been taken to destroy the bridge by which the passage has been made. The common form of a bridge-head is a breastwork open in the rear, offering a salient angle to the attacking force; sometimes it is formed by bastions regularly connected by cortains, or by a series of redoubts. The most favourable position for a bridge-head, or tele-du-post, as it is generally called, is when the bridge which it is intended to defend is situate at a re-entering bend of the river, by where the river forms an are, having the chord which subtends it on the same eide as the bridge-head.

There is no where the river forms an arc, having the chord this subtends it on the same side as the bridge-head. The first monastery of the order was created at Wadden, and the process a river, are of various kinds. The best are those species as five, are of various kinds. The best are those the first monastery of the order was created at Wadden, and the process a river, are of various kinds. The best are those the first monastery of the order was created at Wadden, and the process are ready as the mode of the processed great mortification processes are ready, not only in Sweden, but also in Germany, the mail decket boats, if they can be obtained, haid to other safe maintary —1. A bridge of boats, made with a creates are placed to rether safe by side, on which tresties are placed to rether safe by side, on which tresties are placed to rether safe in surface and order that are analyzed in Sweden, in 1314, and afterwards confirmed by Urbent V. The list tends at the mode of the create for others. The order professed great mortification processed in Early, not only in Sweden, but also in Germany, the processed in Sweden, in 1314, and afterwards confirmed by Urbent V. The list tends the mode of the create for others. The order professed great mortification processes in Early of the order was created at Wadden at Early made and the safe was the mode of processed in Early, not only in Sweden, but also in Germany, the processed in Sweden, but the Refermation, but there are still establishments of it in Italy, Partugal, and other parts of Europe. It was suppressed in Sweden, but the Refermation, but there are still establishments of it in Italy, Partugal, and other parts of Europe. It was suppressed in Sweden, but the Refermation, but there are still establishments of it in Italy, Partugal, and other parts of Europe. It was suppressed in Sweden at the Reformation; but there are still establishments of it in Italy, Partugal, and other parts of Europe. It was suppressed in Sweden at the Reformation; but there are still es

Before Halp, in Mil., a fortification intended for the defence of a bridge, built either to secure the bridge from the sudden attack of an enemy, and then forming an essential portion of the regular works conforming an essential portion of the regular works consisting of a couble row of piles, to which spars are formed of planks lashed to a frame of timber or trees felled on the spot. v. The pile-and-spar bridge, consisting of a double row of piles, to which spars are lashed that support timbers laid across them. There are also what are termed flying-bridges. The swing flying-bridge consists of one or more boats attached Hyling-Dringe consists of one or more noise assuments to a rope, which is fastened at the other end to a buoy in the middle of the river, or to a take in one of its banks: the boat is carried across the atream by the action of the current, and hauled back to the shore from which it started by means of another rope. The trail flying bridge is a boat or raft attached by rings to a guide-rope fixed neross the stream to stakes on either bank, and drawn backwards and forwards.

BRIDGETINES, BRIGITTINS, or BIRGITINES, bridge-e-time.—A religious order, founded by St. Bridget of Sweden, in 1344, and afterwards confirmed by Urban V.

feeted in the Creation." It was judged preferable, in place of giving the whole sum to one man for one case, to divide it into eight equal parts, to be given to eight different persons for as many distinct treatises on subjects connected with the original theme. The several subjects, with the distinguished authors selected to write upon them, were as follows:—1. The Adaptation of External Nature to the Moral and Intellectual Constitution of External Nature to the Moral and Intellectual ation of External Nature to the alloyal and intellectual Constitution of Man, by T. Chalmors, D.D.; 2. Chemistry, Meteorology, and the Function of Digestion, considered with reference to Natural Theology, by William Prout, M.D.; 3. On the History, Habits, and Instincts of Animals, by the Rev. William Kirby; 4. On Geology and Mineralogy, by the Rev. William Buckland, D.D.; 5. The Hand, its Mechanism and Vital Endowments, as evincing Design, by Sir Charles Bell; 6. The Adaptation of External Nature to the Physical Condition of Man, by John Kidd, M.D.; 7.
Astronomy and General Physics, considered with reference to Natural Theology, by the Rev. William Whewell; 8. Animal and Vegetable Physiology, considered with reference to Natural Theology, by P. M. Forst M.D. All of these south phase ways here. Roget, M.D. All of these works have since been re-printed by Bohn in his Scientific Library.

BRIEF, breef (Lat. brevis, short), in Law, is a concise statement of the facts in a cause before a court, and of

the evidence in support thereof, with observations of the attorney or solicitor engaged for the party on whose behalf it is prepared, and references to decided cases affecting any legal points in dispute. It forms the in-structions to counsel who has the management of the cause on behalf of the client, and it should, as far as possible, develop all that can be collected in favour of the opponent, so as to give an opportunity to counsel to anticipate what may be advanced to the prejudice of his client. After delivery of the brief, it is usual to have a consultation with counsel, who advises with his junior (if one be retained) and the attorney or solicitor, and determines on the course to be taken before a jury

BRIEF, in the English Prayer-book, denotes the sovereign letters patent authorizing a collection for a charitable purpose. They are directed to be read among the notices after the Nicene Creed. — Ref. Hook's Church Dictionary.

BRIEF, PAPAL, a pontifical letter dispatched from the court of Rome to princes or other high personages. A papal brief differs from a papal buil in heing less ursple, and in being always written upon paper scaled with red war, with the pope's private seal, the fisherman's ring; hence it concludes with Datum Roma, sub annulo piscatoris (given at Rome, under the ring of the fisherman). The papel bull, on the other hand, is always written upon the rough side of a sheet of parchment, and in ancient Gothic characters. (See Bull, Paral.) The papal brief is issued to decide affairs of inferior importance to those adjudicated

upon by the papal bull.

BRIG OF BRIGANTINE, brig (Fr.), in Mar., a name penerally applied to a square-rigged merchantman with two musts, though mariners of different countries

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marine Amongst English seamen, a

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length, and fusiened to a vard which hangs parallel to the deck; but in a brig, the foremost edge of the mainsail is fastened in dif-ferent places to hoops, which evoircle the mainmast, and able up and down it as the sail is hoisted or 357

towored: It is extended by a geff above and a below. This term is also used to designate a light, flat, open ressel, which can be propelled by salls or ours, used either for fighting or giving. Baleans, brig-aid (Fr.), in Mil., a term apple body consisting of two or more regiments or batter two brigades thus composed forming a disrision army sent into the field. When a number of regiment and the composed common and the state composed are stationed in any camp, such as the composite of the compo are stationed in any camp, such as the comp at Al shot or the Curragh, they are generally grouped brigades. A brigade varies considerably in pure strength, as it may include from two to us battall of infantry, or the same number of squadross cavalry. A brigade of artillery consists of two or the batteries, either of foot or lorse artillery, and eight men form what is called a brigade of Suppers and Miners. The term Household Brigade is sopiled to the household troops, consisting of the Horse-guards, Life-guards, and Foot-guards.

BEIGADE-MAJOR, an officer who is attached to a brigade to perform duties similar to those of the adjutant of a regiment, and acts as an aide de camp to the brigadier-general. He must be a captain or sub-altern officer, and is generally selected from among the captains of the regiments forming the brigade.

captains of the regiments forming use or agreements. BeligaDish Carnerat, briga-deer, the mains given, in Mil., to the officer selected to take the command of a brigade. The post is generally given to one of the colonels commanding the regiments of which the brigade is composed. He holds temporary rank between a colonel and major-general.

BRIGAND. (See BANDIT.)

BRIGANDINE, brig'-an-deen (Fr. brigantin), a coast of mail composed of small scales or pieces of metal sewn upon a closely-fitting tunic of linen or leather, and sometimes covered externally with the same material. It seems to have resembled the tegulated armour of the time of Stephen.

BRIGHT'S DISEASE, OF GRANULAR DISEASE OF THE KIDNEYS, brites, is a particular disease of the kidneys, named after the late Dr. Bright, who first pointed out its nature and character. It consists in a degeneration of the tissues of the kidneys into fat, by which their secreting powers are impaired, and the urea is not sufficiently separated from the blood the urea is not sufficiently separated from the cooca. The distinguishing characteristic of this disease is the existence of albumen in the urine, which, though not invariably, is almost always present, and is readily detected by its coagulating on the application of heat. Healthy urine contains no albumen, which is the great agent in nutrition. It is obtained here at the expense of the serum of the blood, and no disease so plosely approaches hiemorrhage in its power of impoverishing the blood and exhausting its red particles. Hence arises that waxy and leucophlegmatic aspect which so strongly characterizes this complaint. Patients labouratrongly characterizes this complaint. Fatients incouring under this disease are liable to inflammatory and congestive states of other important organs; and heave coms, convulsions, and apoplexy may occur during its progress. The heart, too, may become implicated, and dropsy almost always occurs, sooner or later. This dropsy almost always occurs, sooner or later. This disease may be occasioned by severe cold, repressed perspiration, or immoderate use of ardent spirits, and t not uncommonly follows scarlet fever. In the treatment, the secretions of the skin are to be encouraged by the use of warm baths and disphereties, and the dropsical tendency is to be counteracted, as far as possible, by purratives and directics. Local bleeding pessible, by purgatives and diureties. Local bleeding is frequently beneficial, but general bleeding is to be avoided, from the exhausting tendency of the disease.

BRILL, or PRARL, bril (Pleuronectes thousands); a fish resembling the turbot in shape, but inferior to it both as regards size and quality. The London market is resembling the turbot in shape, Due much market is as regards size and quality. The London market is chiefly supplied from the southern coast of England, where the brill is very plertriful. The brill is distinguished from the turbot by the perfect amoothness of its akin, which is covered with small sosies, and marked with yellowish or rufous spots. As is the case with the turbot, the lateral line first describes as are over the pectoral fine, and then rune straight to the tail. The brill very seldom attain an equal weight with the turbot, rarely going beyond 7 th. It is found both in turbot, rarely going beyond 7 the. The sole and turbot, rarely going beyond 7 ib. It is found both in deep water, as well as in sandy bays. The sale and the flounder belong to the same lamily as the brill.

BRILLIANT, brill-yant (Er. brillant), a name given

to the diamond when cut is the following manner:

The principal face, which is called the table, is surrounded by a fringe composed of a number of facets,
which is all that is raible above the besel when set.

The proportion for the depth should be half the breadth
of the stone, terminated with a small face parallel to
the table, and connected with the surface by elongated The Media, and commissed with the wind to common na-facets. As the octahedron is the most formon na-tural form of the stone, and the brilliant cut is by far the most advantageous in point of effect, besides being the most advantageous form that can be adopted, it is

the most economical form that can be adopted, it is generally preferred. (See Sulvuus.) Brissroofs. (See Sulvuus.) Cicl, when it is formed by dissolving salt in water. Brine-springs are fountains which flow with salt water instead of fresh. There are several of them in dif-

ferent parts of England.

Harring, bris sels (Sax. bristle), are the long, stiff, course hairs taken from the hog, and are principally used in brosh-making. They are mostly imported from Russia and Poland to the amount of 3,000,000 lbs. weight annually. They are separated into different qualities and colours by children, the whitest being technically termed lilies, the rest black, yellow, or

grey, as the case may be.

BRISTOL DIAMONDS, bris'-tol, small brilliant hexagonal crystals of white quartz, found in the limestone

at Chifton, near Bristol.

Brisure, bre-zoor (Fr. briser, to break), in Mil., an expression applied to any part of a parapet or ramart which is constructed in a direction different to that part of the fortification of which it forms a contimona portion. In field works the term brisare is applied to the faces of a star fort, or those of any line of defensive works consisting of a series of re-entering and selient angles.

BRITANNIA METAL, brit-tan'-ya, an alloy of tin, lead, entimony, and brass, in very varying proportions, some makers using equal parts of these metals, while others use an excess of tin amounting to 74 per cent; of the whole. Britannia metal is much used for

spons, feapots, &c. &c., on account of the case with which it may be worked and polished.

BRIANNIA TURULAR BRIDGE, a bridge built by the directors of the Chester and Holyhead railway. ever the Mensi Strait, to connect the island of Angle sey by railway with the mainland, and admit of the transit of passengers and mails to Holyhead, en route to Ireland, without interruption. It was designed by Mr. Robert Stephenson and Mr. Fairbairn, the celebrated engineers (see vol. I. of this work), in 1845, and is remarkable for being the first tubular bridge ever erected. Four important requisites have been satisfied in the construction of this and other bridges on the same principle,—strength, lightness, a span of considerable extent without the support of arches, and nonrathe extent without the support of stenes, and non-interference with the navigation of the waters over which they are thrown. (See Tublian Building The building was commenced in 1836, and the structure completely limited in 1850, one line of tubes being thrown open for traffic in the month of March in that car, and the other in August. The entire length of year, and the other in August. The entire length of the bridge is about 1,840 feet; but the tubes extend to a distance of about 1,512 feet from end to end. The bridge coreists of a double line of tubes, each formed of four state pieces of tubing, supported on three tories of the six pieces of tubing, supported on three tories of the six emasury and two abutments, one on the Anglesey side, the other on the Cacraryon side of the struct. The principal or central support, called the Britannia Toner, is built on a rock which rises above the level of the water in the middle of the strait; it is altogether 191 feet us height, the height of the masoury on which the tube rests being 104 feet above high water-mark. The supports between the central tower and the abutments are built near the shore on other side, and are about 173 feet in beight. The span between the Britannia Tower and the tower on the Carmarvon side is 459 feet 3 inches, and between this tower and the abutment 229 feet; while the span between the Britannia Tower and the tower on the Anglescy side is 453 feet Sinches, and between this tower and the shut-ment 230 feet. The tubes stretching from tower to

tower are twelve feet longer than the span at either end, and considerably more at the abstances; ther rest on bed-plates, which move on rollers and balls of cast iron, to admit of the expansion and contraction of the metal of which the tubes are composed, under the influence of heat and cold. The tube is higher in the influence of heat and cold. The tube is higher in the centre than at either end, the top being in the focus of a parabolic curve; the height externally in the middle is 30 feet, and at either end 22 feet 9 inches; internally is at feet, and at enter end 22 rect threese; undersay, it is 26 feet high in the centre, and 18 feet binches at the extremities, the thickness of the walls being 2 feet; the width of the interior of the tubes is 13 feet 8 inches, and is the same throughout. The iron of which the tubes are made, exclusive of more than swo millions of rivets used to fasten the plates and girders together, weighs 10,550 tons, of which 9,860 are wrought iron; helps and rails. There are nearly 1,500,000 cubic feet of masonry in the towers and abutments. The long tubes, spanning the water from tower to tower, were built on shore, and floated off on pontoons; they were then gradually and successfully raised to their p position by enormous hydraulic pressure, an achieve-ment which is regarded as one of the most remarkable engineering operations of modern times. The entire cost of the structure was about £600,000.

BRITISH ARMY, (See ABMY.)
REITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, is an association of men of science, which meets annually in one of the larger towns of the United Kingdom, and has for its object "to give a stronger impulse and a more systematic direction to scientific inquiry,—to promote the intercourse of those who cultivate science in different parts of the British empire with one another and with foreign philoso-phers,—to obtain a more general attention to the objects of science, and a removal of any disadvantages of a public kind which impede its progress." It is divided into several sections, each of which has a president, vice-presidents, secretaries, and council. The sections are as follows:—A. Mathematics and Physics; B. Chemistry and Mineralogy, including their applications Chemistry and Mineralogy, including their applications to Agriculture and the Arts; C. Geology: D. Zoology and Botany, including Physiology; sub-section D. Physiological Science; E. Geography and Ethnology; F. Economic Science and Statistics; G. Meelasnical Science. Life members pay, on admission, £10; annual subscribers pay £2 for first year, and £1 every subsequent year; and associates pay £1 for admission to the meetings, &c. Life members and annual subscribers are entitled to a copy of the reports gratis. The association originated in a general feeding of the The association originated in a general feeling of the low state of science in England, and the first meeting, which was held at York in 1831, was brought about mainly through the instrumentality of Sir David Brew-Large sums are annually expended by the association in grants to individuals to enable them to prosecute scientific inquiries in particular directions.

BRITISH GUM.-British gum, or dextrine, as it is usually called, from the property possessed by it of rotating a ray of polarized light to the right, is simply torrefied starch. To prepare it, it is only necessary to torrefied starch. To prepare it, it is only necessary to heat starch to a temperature of 300°, until it assumes a buff colour. Starch consists of a soluble substance contained in an insoluble envelope. By exposing it to heat, the envelope is broken, and the soluble matter is set free. (See STARCH.) It is much used by calicoprinters and dyers for thickening dyes and stiffening

fabrica

Barrien Museum.-This great national institution owes its foundation to the will of Sir Hans Sloave, who, during a long and successful career as a physician in London, had accumulated, in addition to a considerable library of books and MSS., the largest collection of objects of natural history and works of art of his time, These he directed, on his death, which took place in 1753, to be offered to the British government for .220,000, which he balieved to be not one-fourth of their value. Fortunately, the offer was at once accepted. The act 26 Geo. II. c. 22, which authorized their purthe act 26 tee, 11. c. 22, which authorized their purchase, directed the purchase also of the Harleian collection of MSS, for £26,000, and enacted that the Cottonian library, which had been given to the government for public use in the reign of William HII., should, with these, form one general collection. This act dis-

rected, that for these purposes the sum of £100,000 be raised by means of lottery, leaving sufficient funds available for the purchase and fitting up of premises aveilable for the purchase and fitting up of premises for receiving them, and for originating a permanent insome. In the spring of 1754, the mansion in Great Eussell Street, then known as Montague House, was purchased as a repository for the whole, and between 1765 and 1759 the different collections were removed into it. Trustees were appointed, and the new institution received the name of the British Museum. It was first opened for public inspection on the 16th January, 1759. A nucleus having been formed, the nucleus rapidly increased, and it became evident that additional accommodation would be necessary. arrival of the Egyptian antiquities from Alexandria in 1801, and the purchase of the Townley marbles in 1805, rendered additional accommodation indispensable, and a gallery, adequate for both, was completed in 1807. The douation by his mejesty George IV. of the library of his father, George III., in 1823, led to active steps being taken for the crection of an entirely new museum. plans of which were ordered by the government to be prepared. Sir Robert Smirke was accordingly emprepared. Sir Robert Smirke was accordingly em-ployed to prepare the plans, and in 1823 the eastern wing of the present building was finished and occupied by the Royal library. The other portions of the new building were gradually proceeded with, and in 1817 the northern, southern, and western wings were issished. The style of architecture adopted is the Grecian Ionic. The principal front of the building is towards the south, facing Great Russell Street. It consists of a great central portico, with an advancing wing on either side, giving to the entire front an extent of 370 feet, the whole of which is surrounded by a columnade consisting of 44 massive columns. The columns are five feet in diameter at their base and 45 feet high; 12 stone steps, 120 feet in length, leading up to the portice. In the pediment are groups of allegorical figures by Sir Richard Westmacott, representing the progress of civilization. On either side of the Museum there is a semi-detached house, containing the residences of the chief officers of the establishment, giving an additional length of 200 feet to the front, and making its entire length 570 feet. The building, on its southern and eastern face, is inclosed by a renaissance iron railing, painted in imitation of bronze, and terminated by gilt spear-heads. An outer iron barrier runs the entire length of the front of the building. The building, as erected by Sir Robert Smirke, consisted of four ranges of apartments,west, north, and south, and inclosed a large open west, north, and south, and incosed a large open quadrangle in the centre. The southern range con-tains the great entrance-hall and staircase. The en-trance-hall is 62 feet by 51, and 31 feet high, and is ornamented by four marble statues,—Chantrey's Sir Joseph Banks, Roubiline's Slakspere, Nollekon's bust of Townley, and Westmacott's Mrs. Damer. To the west of the hall is the principal staircase, leading to the galleries; the centre flight is 17 feet wide, flanked by two pedestals of grey Aberdeen granite intended to receive colossal soulptures. On the first landing are pedestals and carred vases of Huddlestone stone. To the east of the lank in the southern range, on the lower floor, is a room containing the Grenville library; and to the west a saloon, containing antiquities. eastern range, besides some apartments appropriated to MSS., has a magnificent apartment, 300 feet long and 40 wide, containing the Royal library. The northern range of apartments is ellotted to the general library, one of the rooms, the 'main library' being 64 feet by 80, and having a striking appearance. The western range has one magnificent apartment, 300 feet western range has one magnificent apartment, 300 feet in length, centaining Egyptian and other sculpture. The whole of this extent of building on the lower or priscipal floor is of the height of 31 feet, and lighted by large windows, which are at the height of nearly 14 feet from the floor. Ascending the grand staircase we'reselve the upper floor, containing antiquities and natural history collections. The division of the south-

apartments on the upper floor, while of goodly a sions, and well adapted for the purposes they present, architecturally, no striking features, are fitted up with glass cases against the walk table-cases in the centre, for the cribinition of the objects. They are also lighted from a su arrangement which, while it affords more walf-for the exhibition of the objects, likewise adm their being seen to greater advantage. Such we great edifice planned by Sir Robert Smirks, while the time of its being funished, was regarded as the the time of its being finished, was regarded as the of the non-ecclesiastical buildings in the metropolis; but before it had reached completion it was found to be insufficient for the rapidly-increasing wants of the museum. A callery, or saloon, for the Eight marbles was constructed to the west of the western range, and further accommodation for the library was obtained by building what is called "the arch-room," an addi-tion to the western side of the northern wing. Various other additions have since been made, the most impor-tant of which is the new Reading-room, of which it is scarcely possible to speak in too high terms of admira-tion. It occupies the quadrangular space in the centre of the building, and is connected with the entrance-hall by a long passage. At least thirty feet of the quadrangle are left all round, to give air and light to the surrounding buildings. The plan of the new reading-room was suggested by Mr. Panizzi, the present principal librarian, and was carried out by Mr. Sidney Smirke, brother of the architect of the main building. The first parliamentary grant for its construction was voted in 1854, and it was opened in 1857, the entire cost, including the littings and furniture, amounting to about £150,000. It is circular in form, and is constructed principally of iron, being covered by a magnificent dome, the largest, with one exception, in the world. The diameter of the floor is 140 feet, and the height from the floor to the top of the dome is 106 feet. The dome exceeds in diameter either that of St. Paul's or of St. Peter's at Rome, and is only surpassed by that of the Pantheon at Rome, which has a diameter of 142 feet. It is, perhaps, to be regretted that the architect did not cularge its dimensions by a few feet, so as to render it indisputably the largest dome in the world. The room is lighted from above by a range of 20 windows, 27 feet high and 12 feet wide, running round the done, and by a lantern-light, 40 feet in diameter at the top. The walls are lined with books to the height of 25 feet, accessible either from the floor or from two rows of galleries, which run round the apartment. The books accessible from the floor are chiefly books of reference for the use of the readers, who may consult them without applying to any of the attendants. About 20,000 volumes are in this way at the service of the readers. Should a reader require any other book in the library, he has only to copy out its title and number from the catalogue, adding the date, his own name, and the number of his seat, on a ticket provided for the purpose, and in a short time the volume or volumes are placed noislessly at his side. Each reader has a table four feet three inches long, carefully marked off, and fitted up with every convenience for reading and writing; and there is accommodation for about 300 readers. Even this large number of seats is becoming too small for those that seek to avail themselves of the use of the room, and of late numbers have had, on particular occasions, more especially on the Saturday afternoons, to go away disappointed, the seats being all occupied. Those who have occasion frequently to avail themselves of the reading-room and library are best able to estimate the value of the boon which they enjoy; and much praise is due to Mr. Panizzi, who not only conceived the original design, but constantly superintended the progress of the work, frequently suggesting improvements and alterations as it went on. Notwithstanding the great additions made to the Museum, a strong demand still exists for more we reset the upper floor, containing antiquities and another to the west of the staircase, is occupied by antiquities, while botany occupies the division of the southests. The western range is also occupied by antiquities, while botany occupies the division to the east. The western range is also occupied by antiquities, the northern purity by mineralogical specimens and partly by zoological objects, the latter also occupied by antiquities; the northern purity by mineralogical specimens and partly by zoological objects, the latter also occupied by antiquities; the northern purity by mineralogical specimens building, or by removing some part of the order to the eastern range is also occupied by antiquities. When one is the proposal for obviously control of the southern proposal for obviously, and this difficulty, either by the extension of the present building, or by removing some part of the order to the control of the proposals is the east. The western range is also occupied by antiquities, while botany occupies the division to the control of the proposals is the east. The western range is also occupied by antiquities, while botany occupies the division to the control of the order of the control of the proposals is the east. The meters of the control of the order of the control of the order of the

of the most valuable documents of this collection is the Codex Alexandrinus. (See ALEXANDEIAN MANU-SCRITT.) The Lansdowne collection of 1,245 volumes

was purchased in 1805, and the Hargrave collection,

was pareimsed in 1900, and the rangiage confector, achiefly connected with law, in 1813. The Burney collection of 520 volumes is chiefly noted for its copies of the ancient classics. The Royal library of George III. brought with it about 440 volumes of MSS. Francis Henry Egerton, the last earl of Bridgewater, bequeathed to the Museum 67 MSS. together with 25,000 and 27,000; the interest of the former sum to

be spent in adding to the Egerton collection, and that of the latter to pay the salary of an Egerton librarian. To 1833 the Arundel collection, comprising 600 volumes, was obtained from the Royal Society. It is particu-

tarly rich in works bearing upon the early history of the people and language of this country, and contains large assemblage of books of civil and canon law.

These are the principal collections in this department; but there are numerous others obtained either as dona-

tions or by purchase, and containing many works of interest and value. The Department of Prints and

Interest and value. In Department of Prints and Densities comprises those bequeathed by the Rev. C. M. Cracherode, in 1790; by Mr. Riebard Payne-Knight, in 1824; the Sheepshanks collection of Dutch etchings, purchased in 1836; and numerous smaller collections,

sained by gift or by purchase. Latterly this depurtant has been increasing as rapidly as any in the

ing as rapidly as any in the

prised three departments only,—printed books, manuscripts, and natural history, the last including antiscript, and natural natury, the last including and quities, works of art, &c. From time to time the number has been increased, so that now there are eight de-partments; vis., printed books, manuscripts, prints and drawings, antiquities, soelogy, botany, geology, mineratory. Over each of these departments is a chief officer, called a keeper; those of natural hisconset officer, called a keeper; those of natural his-bory having also a superior officer, called a superin-tendent. The Printed Book Department.—The ori-ginal bequest of Sir Hans Sloane, amounting to about 50,000 volumes, soon received a valuable addition in the Royal history, which had been accumulated by the sovereigns of England from the time of Henry VII. downwards. This library was presented to the Mu-seum by George II. in 1757. The collection itself and large, numbering only some 10,500 volumes; but it was valuable, as comprising the libraries of some eminent individuals, as Archbishop Cranmer and Issac Casaubon. At this time it also received the right to a copy of every work entered at Stationers'—Hall. In 1763 it received from George III. a valuable collection of pampillets relating to the civil wars of England between 1640 and 1660, made by George Thomason, a bookseller of the time in St. Panl's Churchyard. In 1823 the splendid library of George III., col-lected during his long reign, at an expense of about \$150,000, was presented to the Museum by George IV. The most important of the recent additions was that bequeathed by the Right Hon. Thomas Grenville, in 1346, consisting of 20,240 volumes, collected at an expense of upwards of £54,000. Besides bequests and donations, the library has been largely increased by purchases, and is now one of the largest collections of books in the world, being estimated to contain (1862) upwards of 600,000 volumes. Manuscript Department .-The history of the manuscript department in general resembles that of the printed books, though its growth has been much less considerable. The Cottonian, Sloanean, and Harleian collections formed the nucleus of this department. The Cottonian collection, made by Sir Robert Cotton, who died in 1631, is particularly rich in Anglo-Saxon MSS, and documents referring to the early history of Britain. Many of the works for-merly belonged to monastic libraries. The Sloanean collection consists of 4,100 volumes, relating chieffy to medical and natural-history subjects. The Harleian collection is of a very miscellaneous character, in-collection and collections of the control of the contr the sacient classics, illuminated missals, and poems, essays, ballads, plays, "in almost every modern language." It consists of about 7,600 volumes, besides 14,900 original rolls, charters, deeds, and other legal decuments. In 1757 another collection was added,—that of the MSS. of the Royal library of England, com-prising about 1,950 volumes, many of which were ob-tained from the monasteries on their destruction. One

## British Museum

Museum. Of the Italian school, there are original drawings by Michael Angelo, Raphael, Paul Vero-nese, Tintoretto, Leonardo da Vinci, Correggio, and others. The German school contains drawings of Peter Vischen Albert Duran Manual Hall Vischer, Albert Durer, Hans Holbein, and others. The Dutch school is represented by one or two superb drawings by Rubens; also numerous specimens of Van Dyck, Rembrandt, Oatade, Teniers, Paul Potter, and A. Cuyp. The French school is represented by numerous drawings by Claude Lorraine and others; and the Spanish by some of Murillo, and others of less note. Among the engravings are a number of speci-mens of the Italian school, including works by Botti-celli, Leonardo da Vinci, Raimondi, and others. Of the German school there are specimens of Lucas Cranach, Murtin Schongauer, Albert Durer, and Cranach, Murtin Schongauer, Albert Durce, see others. The Dutch school is represented by engravings by Lucas van Levden, Van Dyck, Teniers, Rembrandt, Ostade, &c. This department contains, also, branch of works in nielle, an extensive and valuable collection of works in niello, and of sulphur casts. The Department of Astiquities.— The collection of antiquities, which was at first so small as to be regarded merely as an appendage to natural history, now occupies more space than any other department except the library. It is divided into two classes; the one consisting of sculptures, including inscriptions and architectural remains, the other the smaller remains, of whatever nation or period, as vases, terra-cottas, bronzes, coins, medals, domestic utensils, ornaments, &c. The first considerable addition to this department was made by the purchase of the collection of Greek and Roman antiquities made by Sir Hamilton. The Egyptian antiquities brought from Alexandria in 1801, and the Townley marbles purchased in 1905, added largely to the collection; and in 1807 the antiquities were made a distinct department. 1815 an extensive series of sculptures, the frieze of the temple of Apollo Epicurius (or the deliverer), near Phigalia, in Arcadia, was purchased by the Prince Regent, and ordered to be deposited in the Museum. To these were added, in 1818, the Figir collection, consisting chiefly of excellent sculptures from Athens, purchased by government from the earl of Eigin for £33,000. Since that time numerous adof Eight for \$25,000. Since that the numerous activities have been made to this department, particularly in the Assyrian antiquities obtained by Mr. Layard and others, and the sculptures and other antiquities obtained from the mausoleum of Halicarnassus. The sculptures are on the ground floor, and consist of Egyptian, Assyrian, Greek, and Roman remains. The Egyptian sculptures are of basalt and granite, and some of them date from 2,000 years before Christ. They represent human and allegorical figures, usually of colossal size, and inscribed with hieroglyphics. The smaller Egyptian remains are in a gallery on the upper floor. The Assyrian antiquities were obtained by a series of excavations conducted by Mr. Layard during 1847-50, and more recently by Messrs. Rassam and Loftus, at Nimroud, Koyanjik, Korsabad, &c. The monuments consist chiefly of slabs sculptured in slight relief, exhibiting warlike encounters, triumphal marches, &c., and frequently covered with canciform characters (which These monuments are exhibited in a suite of three long narrow rooms, recently erected, together with a large apartment on the basement. The Grecian antiquities are contained in three apartments communicating with the Egyptian gallery, known as the Lycian, Elgin, and Phigalian galleries. The Lycian apartment Eigin, and Phigalian galleries. The Lycian apartment contains sculptures brought from Lycia, 1842-46, by Sir C. Fellowes, and ranging in date from the subjugation of the country by the Persians, B.C. 545, to the period of the Brzantine empire. The Klgin and the Phigalian galleries are so called from containing the Elgin and Phigalian marbles, which constitute the most important part of their contents. The collection of Roman antiquities embraces an interesting series of busts of various dates, arranged in chronological order, running down one side of the gallery; while, on the other, are mosaics and other remains discovered in this country. In the Graco-Roman saloon are antiquities found in Italy, but which bear unmistakable evidence of Greek origin. Among the smaller collections is that of vases, comprising numerous appoint mens of Phonician, Etruscan, Greek, and Roman

## British Museum

workmanship. The bronzes are numerous, comprising a great variety of articles of Greek, Etcuscan, and Roman manufacture. The British and Mediswal col-lection illustrates the condition of the arts in our own were made of flint, through the Anglo-Saxon and Norman periods, down to the Middle Ages, when works of art were produced which excite wonder and admiration even in the present day. The Ethnographical collection embraces articles now, or formerly, in use among nations other than European. The Ethno-Connected with the Antiquity department is the col-lection of coins and medals, which is very rich and valuable. They are arranged into ancient, mediæval, modern, and oriental, and are kept in one room, called the "Medal-room," no space having yet been found for exhibiting any of them to the public. Of the Zoological department it is almost impossible to say anything without being led into details, which our limits strictly forbid. According to the statement submitted to her Majesty's commissioners of inquiry in 1849 by Dr. Gray, after visiting the continental collections, he believes that the Museum collections of mammalia, birds, shells, and lepidopterous insects, are much more extensive than any other public collection, and superior to all the public collections together. This is certainly the case with the first and last-mentioned groups, and he believes also with the other two. The collections of reptiles, fish, and crustaces, are second only to those at Paris, if at all below them;" but "the Museum collection in each of these classes contains many species which the Paris collection wants. The Museum collection of insects, taken as a whole, is much larger and better arranged than that of Paris... The collections of corals, sea-eggs, and starffshes, are very large, far larger than those of all the other European collections together." Since that time the various collections have been largely increased. The Botanical callection is very extensive. The nucleus of this de-partment was formed by the herbarium collected by Sir Hans Sloane, bound in 262 volumes, and comprising about 8,000 specimens collected in Jamaica and else-In 1827 it received, as an addition, the magnificent collection of Sir Joseph Banks, at one time the most valuable assemblage of dried plants in Europe. Since that time the additions to this department have been numerous, so that it now contains upwards of 50,000 species of plants, and in point of value to the botanist is second to no other collection in the world. Since 1858 a portion of this collection has been exhibited to the public. The Geological or Palacontological department contains an extensive series of fossil remains of plants and animals from the various fossiliferous strata. It has been mostly formed within the last quarter of a century, the first great contribution to it being the celebrated collection of Dr. Mantell, in 1839. It has since received large additions. The fossils and minerals together occupy six rooms of the north gallery of the Museum, the fossils being mostly disposed in wall-cases around the rooms, and the minerals in table-cases in the centre. The mineralogical collection, which is large and is rapidly increasing, is arranged according to a chemical classification, which, however, is not fully up to the present state of the science, and a re-arrangement is in contemplation. The management of the Museum is vested in a body of trustees amounting to forty-nine in number. The three principal trustees are the archlishop of Canterbury, the lord chancellor, and the speaker of the House of Commons, in whom is vested the patronage to the various offices, except that of principal librarian. There are twenty-two other official trustees; nine are representatives of the families of distinguished donors; and lifteen are elected by the other trustees. At first, the admission to the Museum was by means of printed tickets after written application; and the visitors were hurried through the several departments by attendants, not more than fortylive visitors being admitted per day. From time to time more liberal measures have been adopted, and now all who present themselves are freely admitted. The Museum is open daily during Easter, Whitsun, and Christmaa weeks, and on Mondays, Wednesdays, and Fridays, in every other week, except the first week of January, of May, and of September, when it is closed. In summer, it is open from 10 to 6, in winter from 10

## Broad-sword

to 4; and during the months of March, April, Se to 4; and during the months of March, April, September, and October, from 10 to 5 o'clock. The satisfact and October, from 10 to 5 o'clock. The satisfact and the satisfact and the satisfact and the satisfact and taxes, £520; fact and light, £1,300; stationers, £300; purchases and acquisitions, £22,330; bookbinding, £00, £10,910; printing catalogues, &c., £4,400, buildings, repairs, &c., £10,331; furniture and fittings, £8,131; incidental expenses, £1,020. The expenditure of the financial year 1369-70 was £13,823 in excess of the preceding year.

BRITISH NAYY. (See NAYY.)

BRITISH NAVY. (See NAVY.)
BRITISH NAVY. (See NAVY.)
BRITISHNES, brit'-tl-ness (Ang.-Sax.), a property
possessed by some bodies, which, although solid, have
their component particles so arranged, that the ophesive force which holds them together is overcome by com-paratively small mechanical force. They can easily be reduced to powder. Britteness is the reverse of mal-leability: as an instance, lead is malleable and glass is brittle.

(See DIATOMACEE.) BRITTLEWORTS.

BRITLEWORTS. (See DIATOMACEE.):
BRIZA, bri'.za' (Fr. brizo, I nod, on account of the quaking character of the spikelets), in Bot., a gen. of grasses, commonly known as Quaking-grass, or Maideniar. Two species are natives of Britain, the B. major and minor. Their dense clusters of flowers hang upon the ends of very delicate filamentous pedundes, forming elegant panicles, which shake with the slightest breath of air

BRIZURE, briz'-ure (Fr. briser, to break), an expi sion in Her., used in reference to any charge that is in a broken condition, or bruised. The terms brize and

brief are used synonymously.

Broach, or Broche, bruche (Fr. broche, a spit), a name given in Arch. to a small steeple or spire that is built on the top of a tower, rising immediately on the summit of its walls, without being surrounded at the base by a parapet or battlements.

Broad Arrow, broad-ar'-ro, in Her., a charge repre-enting an old-fashioned arrow-lead, consisting of a hollow central spike from which side-pieces diverge in monow central spike from which ands-pieces diverge in the form of the letter V, the outer edges of which are perfectly straight, and the inner engraised. In heraldic phraseology, the broad arrow is commonly called a

Pheon.

BROAD ARROW, in Mar., a mark formed by three lines broader at one end than the other, meeting together in a point. It is stamped or cut on all timber or metal used in her Majesty's dockyards, and on all or ment used in her algesty a lockyards, and on mand stores that will bear incision or impress, belonging to the crown, that they may be identified if stolen. Sails and ropes are marked by the intermixture of a coloured thread or yarn. Thread of

a different colour is used in each of her Majesty's dockyards; so that any storekeeper can not only tell that the material is the pro-

ARROW.

BROAD

perty of government, but also say in what dockyardit was made. It is unlawful for any one to have stores bearing the broad arrow, or any other govern-ment mark, in his possession; and an act was passed in 1698 by which a fine of £200 and costs is inflicted on any one on whose premises property so marked may be found.

IROADSIDE, broad side (Ang.-Sax.), in Mar., is precisely the same as would be called by soldiers a volley, i.e., the discharging of the whole of the guns contained in one side of a ship at the same moment. The weight of shot and shell that can be delivered by the broadside of a line of buttle ship is very great. the broadside of a line-of-battle ship is very great; the Duke of Wellington, of 131 guns, can fire off at one broadside a weight of metal amounting to 2,400 lbs. When a vessel is pressed down on one side in the water by the wind, she is said to be on her broadside. the

Broad-sworn, broad-sord, a sword with a broad blade, designed chiefly for cutting, but capable of being used, like the rapier, for thrusting. When made so as to be employed in the latter way, as well as for cutting, it is called a sabre, and forms one of the weapons of the English and continental cavalry soldier. The modern representatives of the old English broad-sword is the clavingre, with which the Highland regiments in the English service are still armed. The English became more and more skilful in the use of the broad-sword, according as the wearing of suits of mail began to grow out. It was a common weapon in the

\* 61

days of Queen Elizabeth, and the "swash-bucklers or "bullies," of that period achieved on unenviable notoristy for their skill in it. The buckler, or shield, a nedgraty for their skill in it. The buckler, or shield, a very ancient article of smour, generally accompanied the broad-sword, forming as it did the principal means of defence against it. At the close of the 16th century, award-and-buckler flekting began to grow out of use, having been superseded by the continental mode of flekting with the rapier, or thrusting sword, and the dagger. The Highlanders, however, continued to us the weapon, as well as the larget or buckler, until they were disarred after the right of 1745. With the Scotch Highlander and was termed the clay. Highland Clans the broad-sword was termed the claymore, and it was their national weapon. Sir Walter Scott, in the "Ludy of the Luke," gives several spiritairing descriptions of combats with the claymore and tanget. As has been stated, the sabre used in the cavalry regiments at the present time is a broad-sword with a point sharpened for thrusting. Every recruit is taught to use the weapon so as to make it a formidable instrument of destruction in warfare. In the accompanying illustration is shown a reduced model of the sabre-



BROADSWORD TARGET.

target. The lines within the circle denote direction the in which the cuts" are to be made. Cut1 is directed diagonally through the target, coming out at 4; 2 is the cut same, only from left to right; wards, diagon-ally, and 4 is the same, only in the opposite

direction: cut 5 is horizontally through the target, from right to left, and 6 from left to right; out 7 is perpendicularly downwards. All these cuts are fairly given with the edge of the broad-sword. The swords drawn upon the target represent the guards. There

are seven cuts, seven guards, and three points.

BEOCADE, bro-kaid' (Sp. brocado), a stout siken, variegated with gold and silver, raised and enriched with foliage, flowers, and other ornaments, and used for the dresses of both sexes during the 17th and 18th centuries. In an inventory of the wardrobe of Charles II., in the Harleian library, is mentioned white and gold brocade at two pounds three and sixpenns per yard, and collere-du-prince brocade at two pounds three shillings per yard." Brocade was not known in England till after the 13th century, and was a great rarity and luxury upon the continent in the

BROCAGE, broe'-dj (Ang.-Sax.), is the hire or com-mission due to a broker or agent, for managing a transaction frequently of a mean or unlawful nature.

BROCAGE CONTRACTS FOR MARRIAGE, are contracts by which a reward is stipulated for the promotion of a particular marriage by means of exerting an influence over one of the parties. These contracts are in law held to be contra bonos mores, and can afford no ground of action.

BEOCARDS, BROCARDICS, OF BROCARDICA, bro'-kards Besockers, properly, maxims or principles in law, as the Becommics Juris of Azo; but it has come to be applied to maxims or proverbs generally. It is said by Vossius to be derived from the Greek term protrachia, first elements; but others, with more probability, derive it from Burchard, or Brocard, bishop of Worms, who ande a collection of canons, called from him Brocur-dies; and as they shounded in short sententious sayings and proverbs, the name came to be applied to works of that description.

Buccoon, brok o-te (Ital., spronts), the name given to one of the many cultivated varieties of the Brassica oleraces. It is a common garden vegetable, and differs from the carliflower only in having coloured instead of white heads. (See Brassica.)

Brown us, bro-shure' (Fr. brocher, to stitch), in a

term taken from the French, and used in the same sense as pamplifet; properly a stitched book.

Brochus, or Brochus, bro'-kus (Gr., a snars).

medical term, denoting a noose, or a particular kind of bandage. It is also used to signify a person having inordinately thick lips, or whose teeth project for-

BROGUE, or BROG, brogue (Irish), was a sort of rude, clumsy shoe, formerly worn by the native Irish and the Scotch Highlanders. From the manner in which the wearers of brogues pronounced the English language, the term came to be applied to their pronunciation.

Broken-backen, bro'-kn-bak'-ed, in Mar., a term

applied to the state of a ship so loosened in her frame, either by age, weakness, or some great strain, as to droop at each end.

BROKEN-WIND, a disease or unsoundness in borses, caused by a morbid secretion from the mucous mem-brane lining the laryux and the windpipe, with its many ramifications. The nature of the disease is not well understood, and the present mode of treating it is very unsatisfactory. Broken-wind is in reality curable; and all that a veterinary surgeon can do is to Low-bred horses, which do not mitirate the disease. thrive, are most liable to broken-wind. While the horse is being exercised, the symptoms can be best observed. The eyes become suffused with blood, which is mostly inpure, the postrils are distended, and the breathing becomes very laboured. Horse-dealers some times try to conceal the defects of a broken-winded horse by making him swallow grease. The effect. however, soon passes away, and it is therefore only the very ignorant and unwary who are thus deceived. A broken-winded horse has always a hollow cough, and, if watched while at work, the ribs are noticed to be actively moved, and after the air is expelled from the lungs they are depressed with a sudden jerk, produced by the abdominal muscles. When employed on hard work, broken-winded herses often drop down and die from exhaustion or from suffication, internal hemorrhage, or congestion of the lungs. The disease of broken-wind was much more common in former times than at the present day; it is now found principally in those countries where horses are budly managed and coarsely fed.

BRORER, bro'-ker (Ang. Sax.), is a person employed as an agent to transact business between merchants or others, usually in the interest of either the buver or seller, but sometimes acting for both parties. Generally, brokers confine themselves to the purchase and sale of some particular articles, or class of articles, by which means the; obtain a more intimate knowledge of their qualities, market value, &c., and are thus able to negotiate on more favourable terms for their employers. A merchant trading in a variety of articles cannot have the same intimate knowledge for his guidance; and bence generally finds it for his advantage to effect his purchases and sales by means of brokers. Brokers are of different kinds, according to the branches of business to which they devote themselves; as bill-brokers, exchange-brokers, insurance-brokers, ship-brokers, pawubrokers; all of whom will be found noticed under their special heads in other parts of this work. In London, every person desirous of acting as a broker must be licensed by the lord mayor and aldermen for that purpose, under such restrictions and limitations as they may think fit to enact. When admitted, he must give bond, under a penalty of £500. for the faithful discharge of his duties, without fraud or collusion, and to the utmost of his skill and knowledge. He is further bound not to deal in goods on his own account—a stipulation which is very commonly broken. Each broker pays on admission a fee of £2. and a like sum annually, so long as he continues to act.

Any person acting as a broker without being duly licensed, is liable to a penalty of £100 for each transac tion; but the law is frequently evaded. Every broker is bound to register regularly in a book all the contracts which he has entered into. The term broker is also usually applied to persons who buy and selisecond-hand household furniture, though such as occupation bears little analogy to that which we have been describing, as these parties generally buy and sell, not as scents, but on their own account. Such persons irequently superaid to their business the appraising

#### Brokerage

and reling of goods distrained for rent; for the per-formance of which functions, however, they must prowide themselves with an excise license, and conform to the regulations enacted by 57 Geo. III, c. 93.—Ref. Macculloch's Commercial Dictionary; English Cyclo-

Pediu-Arts and Sciences.

BROWREAGE, bro'-ker-ij, is the pencentage or commission charged by brokers for the sale or purchase of

Brown, bro'ma (Gr. broke, I eat), denotes food of any kind that is masticated; and hence bromatology is

a discourse on food, bromography a treatise on food.

Browal, bro'mül, in Chem., a compound formed by the action of bromine upon alcohol. It is a colouriess oil, of spec. grav. 3:35, and is analogous in its composition and properties to the corresponding compound of chlorine,—chloral (which see).

Brown-Grass. (See Brown's.)

BROWNELGARS. (ore Discounts.)
BROWNELLS, bro-me'-b'-a (numed after Bromel, a Swedish hotenist), in Bot., the typical genus of the nat, ord. Bromeliscew. The green fruit of B. pingnin is used as an anthelmintic and a diuretic in the West Indies: the prickly leaves yield strong fibres, which are twisted into ropes, and woven into coarse cloth.

BROMELIACEM, bro-me-li-ai'-se-e, in Bot., the Bromelia or the Pine-apple fam., a nat. ord. of monocotyledonous plants, sub-class Petaloidea. They are herbs or somewhat woody plants commonly epiphytical. Leaves persistent, crowded, channelled, rigid, sheathing at base, and frequently scurly and with spiny margins; flowers showy; perianth superior, or nearly or quite inferior, arranged in two whorls, the outer of which has its parts commonly united into a tube, while the inner has its parts distinct, imbricated, and of a different colour; stamens 6; anthers introrse; ovary 3ceiled, with a single style; fruit enpsular or indehiscent, and 3-celled; embryo minute, in the base of mealy albumen, with the radicle next the hilum. There are 29 genera and about 175 species, which are dis-tributed through the tropical regions of America, West Africa, and the East Indies. They are chiefly important for yielding edible fruits and useful fibres. Some have anthelmintic properties, and others contain colouring matters. (See Ananassa, Brownlia, Bill-

BERGIA, TILLANDSIA.)
BROMIC ACID, bro'-mik, symbol BrO, equivalent 120, the only known compound of bromine and oxygen. It corresponds in composition to chloric acid, but has never been obtained in an auhydrous condition. combination with water it forms a colourless liquid, which first reddens and then blesches litmus. bases it forms bromates, which are similar in their

properties to chlorates.

BROMINE, bro'-mine (Gr. bromos, a stench), symbol Br, equivalent 80, spec. grav. 2:908. Bromine is an elementary substance, consisting of a heavy mobile fluid of a deep brownish-red colour. When exposed to the air, it volatilizes rapidly, and boils at 145° Fahr. Its smell is disagreeably pungent, giving rise to a painful spasm of the glottis, if breathed. It acts energeticaily on the skin, producing a sore immediately on contact. At -7° Fahr, it solidifies into a yellowish-brown crystalline mass. It was discovered in 1826, by Balard, in minute quantities in sea-water, in which it exists as bromide of magnesium. It also occurs in a native bromide of silver found in Chili, and in union with various alkalies in certain mineral waters. It is prepared by passing chlorine through a solution of alkaline bromides, until the yellow colour produced remains uniform. Ether is added, which isolates the bromine. This is separated from the saline solution and shaken up with a solution of caustic potash. The solution is then evaporated to dry-ness, and the residue distilled with binoxide of mangenese and suphuric acid. Bromine is the only element that is liquid at ordinary temperatures, except mercury. The properties of bromme resemble those of chlorine; but they are somewhat less strongly developed. It bleaches regetable colour, and is a nondeveloped. It beaches regenence colour, and is a non-supporter of combustion. It is slightly soluble in water, giving to it a vellow colour. It combines with water and forms a hydrate, which crystallizes in actahedra at 32° Fahr. The principal compounds of bromine are hydrohromic acid, a compound of one diluent drinks, as barley-water or linesed tes, given, squiralent each of hydrogen and bromine. The action it is frequently necessary to have recourse to blood.

## Bronchitis

of hydrobremie sold on metallic exides is p similar to that exerted on them by hydrocaler. Thus, hydrobromic acid and potests combine, if bromide of phiassium and water. Hydrobrom bromide of potassium and water. Hydrotromac sure is soluble in water to a considerable extent. It is colourless, strongly acid, and suffers no charge on corposure to the sir. On the addition of nitrio seid, decomposition takes place, and a bromic squa resist in formed, which, like the chloric squa regist in the charge of the compound, bromic acid (which see). With chloring, bromic forms a chloride, a reddish, vellow rotation to the chloride. bromine forms a chloride, a reddish yellow rotallishiquid, soluble in water, and possessing bleaching properties. It also unites in the account of the control of the contr perties. It also unites, in two proportions, with phosphorus and iodine. With sulphur, it forms a single bromide. None of these compounds merit notice. Bromine and its compounds are extensively employed in the daquerective and collection processes. In the in the daguerrectype and collection processes. former, it reduces the time of exposure from minute to seconds. Bromide of potassium is also used in medicine.

BROMORORM, bro'-mo-form, a compound of bro-mine and formyl, corresponding to chloroform, which is a compound of the latter radical with chlorine,

BROMUS, bro-mas (Gr. hromos, wild oat), in Bot, Brome-grass, a gen. of plants belonging to the nat, ord. Graminacea, characterized by the flowers being in lax panicles; the glumes many-flowered; the outer pales bifid at the extremity and awned beneath; and by the very short stigma growing from the face of the germen beneath its apex. Many of the species are very common British grasses. Some have erroneously

been reputed to be purgative.

BEONCHI, bron'-ke (Gr. bronches, the windpipe), Dancest, oron-ke (or. oroncoo, the windsper, in Anat., is the name given to the subdivisions of the trachen, or windpipe, which proceed to the lungs. The trachen divides into the two bronch opposite the third dorsal vertebra. The right bronchus is larger than the left, and is shorter, reaching the lung on a line with the fourth dorsal vertebra. The left bronchus passes under the arch of the aorta. The structure of the bronchi is similar to that of the traches, being round and cartilaginous in front, and flat, with mus cular and fibrous tissue, behind. On entering the substance of a lung, the bronchi divide and subdivide into numerous branches, till they terminate in very minute air-cells.

BRONCHITIS, bron-ki'-tis, or inflammation of the lining membrane of the bronchial tubes, is one of the most prevalent and fatal diseases in this country. great exciting cause is cold, especially when combined with moisture; but whatever tends to diminish the general vigour of the system, and excesses of every kind, predispose to it. Any sudden change of ten-perature is apt to produce it. It is especially preva-ient during the spring months. Its first symptoms are generally those of a common cold, accompanied with an occasional cough and a sense of weariness and headache. The cough increases, and there is a feeling of oppression in the chest, and the breathing produces a kind of wheezing noise. The pulse is rapid and weak, and there is extreme lassitude, with pain in the limbs, mental heaviness, &c. If the feverish symptoms increase, the breathing becomes difficult from the clog-ging of the tubes with mucus, which is, to some extent, expectorated during the cough. In severe cases, the symptoms become more and more alarming; the breathing becomes so emburrassed that the patient can no longer lie down, but requires to maintain an upright posture and use all his muscles in respiration. At last, he is so exhausted that he ceases to expectorate, and dies of suffication from the accumulated mucus, usually in from five to seven days. Even in less severe cases, the delicate respiratory tubes are frequently permanently injured; so that the proper acrasica of the blood is interfered with. The treatment of this disease will vary, according to its nature and the constitution of the patient; and the necessity of always having recourse to a medical man cannot be too strongly insisted upon. The great object of the treatment is to reduce and remove the inflammatory condition of the organs: hence a mustard poultice should be applied to the chest, the feet bathed in hot water, and warm

#### Bronchocele

letting and to administer emetics, in order to remove ieting and to administer emetics, in order to remove the accumulations of mueus. The howels should be kept moderately open during the whole course of the disease. (See Cataram, Course.) BRONGHOUSE. (See GOTTE.) BRONGHOUSE. (See GOTTE.) BRONGHOUSE. drive ET.), an alloy of copper and tin, to which are sometimes added small portions of zinc and lead. Got hell seed.

lead. Gun, bell, and speculum metal partake much of the nature of bronze. The manufacture of bronze is very ancient, having been brought to a considerable state of refinement 700 years before the Christian era. The ancients used it for weapons and tools, on account of its great hardness; but it was at length superseded for these purposes by steel, and is now only employed for statuary and medals. For the former purpose, bronze is particularly well fitted, being tough, hard, little affected by atmospheric influence, besides possessing the valuable property of flowing freely v melted, and expanding when solidifying; by which means the most intricate detail in the mould is copied with sharpness. Bronze may be tempered in an ex-actly contrary manner to steel. If cooled suddenly, it becomes so soft that it may be hammered and turned in the lathe; but if allowed to cool slowly, it becomes brittle, hard, and clastic. In casting large statues or other works, the greatest skill and care are necessary, from the circumstance that alloys of copper and tin have a tendency, when melted, to separate, the tin rising to the top of the melted mass, and forming a more fusible mixture. From the following analyses, it will be seen that bronze differs greatly in composition: Anient bronze from Celtie antiquities,—tin, 12; copper, 88. Egyptian bronze,—tin, 22; copper, 78. Chinese bronze,—tin, 20; copper, 80. Roman bronze,—tin, 15; copper, 85. Modern bronze from the statue of Louis XV.—copper, 82:45; zinc, 10:30; tin, 4:10; of Louis XV.,—copper, 82:45; zinc, 10:30; tin, 4:10; lead, 3:15. (See also Bell, Speculum, and Gun-METAL.)

BRONZE, ALUMINIUM, is the name given by its discoverer, Dr. John Percy, F.R.S., to an alloy which promises to become of great value in the manufacturing arts. Mr. I. L. Bell, who has manufactured a large quantity of this metal, thus describes its composition:— Copper is melted in a plumbago crucible, and, after being removed from the furnace, the solid aluminium is added. The union of the two metals is attended with such an increase of temperature that the whole Decomes white-hot; and unless the crucible con-taining the mixture is of a refractory material, it is fused by the intensity of the heat. A vessel which has remisted a heat sufficient to effect the fusion of copper has been melted when the aluminium has been added. In a statement communicated by Lieut, Col. Strauge to the Astronomical Society, the following facts were put forth, which, in their condensed form, we borrow from the last edition of Ure's Dictionary of Arts, Manufactures, and Mines :- Regarding the most Arts. Manufactures, and Mines:—Regarding the most important qualities of the alloy as—1. Tensile strength; 2. Besiatance to compression; 3. Malleability; 4. Transverse strength or rigidity; 5. Expansive ratio; 6. Founding qualities; 7. Behaviour under files, cutting tools, &c.; S. Resistance to atmospheric influences; 6. Fitness to receive graduation; 10. Elasticity; 11. Fitness for being made into tubes; 12. Specific ir. Risess for being made ind to determine each of those conditions. Tensile strength.—The result of those conditions. Tensile strength.—The result of trials made by Mr. Anderson, of Woolwich, was—the average tensity of this metal proved to be 22 tons 12 owt. (50,624 lb. breaking weight per square inch. Blongation did not take place until 4,300 lb. in the one case, and 3,600 lb. in the other, had been applied, when a permanent elongation was noticed of '009 of an inch in the first specimen, and '034 of an inch in the last. Resistance to compression.—The ultimate amount of compression applied was upwards of 59 tons, under which the specimen became much distons, under which the specimen became much dis-terted. Compression was not perceptible until up-wards of 9 tons per square inch was applied, when the specimen gave way, but in the very slightest degree. On the weights being removed, a certain amount of elasticity was ramarked. Malleability.— The quality of this metal for forging purposes would appear to be stoclent. There were specimens in the International Exhibition of 1863, showing that the

### Bronze-Powders

alloy could be drawn out under the hammer almost to a needle-point. Transverse strength.—These experiments were made by Messre. Simms. The same weight applied to these bars altered the index of the instrument as under: Brass, 2:22 divisions; gun-metal, 0:15 of a division; aluminium bronze, 0:05 ditto. Heuce aluminium bronze is three times more rigid than gun-metal, and 44 times more rigid than brass, Expansive ratio.—Aluminium bronze is affected by change of temperature a little less than gun-metal, and much less than brass. Founding qualities. The alloy produces admirable castings of any size. Bekaviour under files, cutting-tools, &c.—In this respect it leaves nothing to be desired. It does not cleg the file; and in the lathe and planing-machine the tool removes long clastic shavings, leaving a fine, bright, smooth surface. Resistance to atmospheric influences, -This alloy tarnishes much less readily than any metal usually employed; viz., gun-metal, brasa, silver, cast iron, or seed. Fitness to receive graduation. -The lines are remarkably pure and equable, and very distinet under the microscope, notwithstanding the yellow colour of the metal. Elasticity.—No wires tried for the suspension of Foucault's pendulum for illustrating the rotation of the earth were so durable-not even, those of steel-under that severe ordeal, as wires of aluminium bronze. Fitness for being made into tubes .-It admits of every process necessary for the purpose. Specific gravity.—The specific gravities of alloys of aluminium and copper are,—3 per cent. of aluminium, 8:601; 4 per cent., 8:369; 10 per cent., 7:689. At the Elswick Works, Captain Noble, R. A. goodfrand tracking are consistent and specific and sp R.A., confirmed previous experiments on the capability of aluminium bronze to resist longitudinal and transverse fracture; and, in addition to this, he ascer-tained that its position to withstand compression stood halfway between that of the finest steel and the best iron. The bronze containing 10 parts of aluminium and 90 of copper affords an alloy endowed with the greatest strength, malleability, and ductility. The colour of the copper is affected by a very trifling addition of the other constituent, and the alloy gradually improves in those valuable qualities just mentioned until the proportions given above are reached. After this—that is to say when more than 10 per cent. of aluminium enters into the composition of the bronze -the alloy gradually becomes weaker and less malleable, and at length so brittle that it is easily pounded in a mortar.—Ref. Ure's Dict. of Arts, Manufactures, and Mines, 6th edition.

BRONZE-PAINT, which in Commerce is generally called gold-paint, is a preparation of gold-coloured bronze-powder and turpentine. The turnentine employed in the macufacture of bronze-paint is mixed with lime to neutralize an acid reaction which it usually has

BRONZE-POWDERS are made from an alloy of copper and zinc, in varying proportions, according to the shade required. In the preparation of the green bronze there is an admixture of verdigris. The alloy, after being laminated into very thin leaves and carefully unnealed, is levigated into an impalpable powder with fine oil. Mr. Brandeis, a large American manufacturer of bronze-powders, states that bronze, or, more correctly, metallic powders resembling gold dust, were invented, in 1648, by a monk at Furth, in Bavaria, named Theophrastus Allis Bombergensis. He took the scraps, or cuttings, of the metallic leaves, then known as "Dutch leaf," and ground them with then known as "Dutch leat," and ground them when honey. This roughly-made bronze-powder was used for ornamenting parchments, capital letters in bibles, choral books, &c. Until the American firm of Messra. Brandeis took up the manufacture of bronze-powders by a patent scientific process, and on a large scale, the markets of the world were principally supplied from Furth, in Bavaria, where the manufacture was from Furth, in Bavaria, where the innaulacture was carried on in the primitive way in which its inventor had left it. When it is remembered that bronze-powders are largely used in bronzing iron and tin ware, in japanning, as well as in the embellishment of ornamental works in leather, oil-cloth, wood, paper, &c., we may observe why the demand for them is so large and so steadily increasing. "There are four sorts of Dutch leaf:—Common leaf, soft and of reddish cast, is composed of 25 to 30 per cent. of zinc to 75 "There are four

## Bronzite

or 70 per cent. of copper. French leaf contains more zinc, is harder, less ductile, and has a purer yellow colour. Florence leaf has a larger proportion of zinc, and is a greenish god-colour. Lastly, White leaf is composed of tin. The more zinc these alloys contain, the more zinc these alloys contain, somposed of tin. The more zinc these shows contain, the harder, the more brittle, and more difficult are they to work into perfect leaves. The manner of beating is similar to the mode of producing gold leaves. The acrupa, buttings, and fragments of these leaves are the materials for the German bronze. leaves are the materials for the German bronze-powders: first brushed through a sieve and ground with gum-water on marble slabs for six hours, the gum washed out, the powders sorted, dried, and a coating of pure grease given to make them appear more brilliant, and to protect them from oxidatios. Varieties of colour, such as orange, &c., are produced by a film of sub-oxide upon the surface of the particles."—Ure's Dict. of Arts, 4c. An analysis of the best European bronze-powders has been given by Dr. Konig in the following table:—

	Copper per Cent.	Zine per Cent.	Iron per Cent.	Tin per Cent.
1. Light yellow	52:38	16-69	0-16	0
2. Gold-yellow	84:50	15:30	0.07	0
yellow	90.60	9.61	0.20	0
4. Copper-bronze orange 5. Copper-red high shade	98:93	0.73	0.08	0
of purple colour	99-90	0.00	trace	0
6. Purple-violet	98.23	0.2	0.30	trace
7. Light green	84.32	15.02	0.02	trace
grey	0-00	2.30	0.56	97:46

BRONZITE, bron'-zite, a variety of dialtage occurring in serpentine and greenstone. It is found in dark green foliated masses, with a pearly metallic lustre resembling bronze; whence its name. Chemically it is a silicate of magnesia, containing small portions of lime, protoxide of iron, manganese, alumina, and water.

BROOKITE, brook'-ite, oxide of titanium, crystallizing in thin hair-brown masses; found on Snowdon and in Dauphiny.

BROOM. (See Crrisus.)

BROOM-RAPE. (See OROBANCHACER.)

BROSIMUM, bra'-si-mum (Gr. brosimos, estable), in Bot., a gen. of plauts belonging to the nat. ord. Artocarpacea, or Bread-fruit family. The species B. ntile, sometimes called Galactodendron utile, is the celebrated pale de vaca, or cow-tree, of South America. It yields a milky juice, said to be almost as nutritious as milk from the cow. From the bark of B. namagna strong fibres are obtained, which are much used in Panama for making sail-cloth and ropes.

BROTHER, bruth'er (Lat. Frater: Ger. bruder), is a term denoting the relationship between a male and a male or female born of the same father and mother. male or female born of the same father and mother. When the relationship is only by one of the parents, the term half-brother, or brother of the half blood, is frequently used. A brother-german is a brother both by the father's and mother's side; a brother-uterine, only by the mother's side. A foster-brother is one suckled by the same nurse, but not born of the same parents. A brother-in-law is a relationship by marriage,—the brother of one's wife, or the husband of one's sister. In Scripture, the term brother is used in a wider sense, as in the case of Abraham and Lot. one's sister. In Scripture, the term brother is used in a wider sense, as in the case of Abraham and Lot, Jacob and Laban, &c. It is customary for kings to style each other brother; and persons in the same profession, as judges, bishops, priests, &c., not unfrequently do so. The primitive Christians called each other brothers, and monks of the same convent usually adopt the same phraseology. Certain classes of monks were particularly called Brothers; as the monks of St. Dominic, Presching Brothers; those of St. Francis, Minor Brothers. (See Bekthern) Lay brothers were an inferior class of monks, not in holy orders, but bound by monastic rules, and usually employed as ser-

### Brucite

vants in the monasteries. They were sometimes called outer brothers. In the Middle Age writers, brother sometimes denotes a comes, or governor of a previous. In a more general sense, brother or brethres is used for mankind in general; all the human race being descended from the same parents.

BROUSSONETIA, broc-so-net ti-d (in honour of M. BROUSSONETIA, 6706-80-ne-si-a (in noneur on man Broussonet, a French naturalist and traveller), in Both, a gen. of plants belonging to the nat. ord. Moracce. There is but one species, B. papyrifera, the paper nulberry, the bark of which is used in Chira and Japan as paper material, and in the South-See Islands. for making a kind of cloth. The plant forms a small tree, with soft, brittle, woolly branches, and large, hairy, rough leaves, either heart-shaped and undivided, or cut into deep irregular lobes. It is not uncommon in British shrubberies. BROWN COAL, broun-kole, a name used for lignite, in contradistinction to fine coal, which is black. (See

LIGNITE.)

BROWNIE, brou'-ne, the name of a kind of fairy formerly believed in in the Hebrides and North of Scotland. He was an obliging sort of elf, that used to come into houses by night, and perform lastily any piece of work that might remain to be done. At one time every family of importance believed that they had a special brownie, and they gave him offerings of the various products of the place. Thus some, when they churned their milk, or brewed, poured some of the milk or wort through the hole of a stone called the brownie's stone. The brownie of Scotland bore a very striking resemblance to the Robin Goodfellow of England.

BROWNING, broun'-ing (Ang.-Sax.), a process by which the barrels of muskets and rifles are partially which the parties of makers and rines are partiesly oxidized and sulphur nized, and so prevented from being easily rusted. The barrel being brightened and cleaned thoroughly from oil, a mixture of nitric acid, chloride of iron, sal namoniac, and sulphate of copper, is laid on, and allowed to remain several hours. The process is repeated several times, and the barrel is cleaned

ultimately with alkaline water, and polished.

Browners, bround ists, a sect of Christians which arose in England towards the end of the 16th century, and took their name from their founder, Robert Brown, a man of some learning, but of an impetuous and fiery temper. He began to inveigh against the ceremonies of the Church of England in 1580, and zealously diffused his sentiments by preaching from Place to place, principally in the county of Norfolk. Being greatly opposed, he left England with a congregation which he had collected, and settled at Middleburg, in Zealand; but, quarrelling with his flock, he, three years afterwards, left them, and returned to England. He again itinerated through the country, and preached with considerable success; but he afterwards conformed to the established church, and obwards conformed to the established church, and obtained the rectory of Oundle. His followers, however, continued to increase, so that Sir Walter Raleigh, in 1692, estimated their number at upwards of 20,000, exclusive of women and children. They were treated with great rigour, and several of them were executed in the reign of Elizabeth. Many fied to Holland, where several churches were established; as in Amsterdam, Rotterdam, and Levden. This sect subsequently dam, Rotterdam, and Levden. This sect subsequently merged in the Independents, of whom Mr. Robinson, pastor of the Brownist church at Leyden, is regarded as the real founder. The Brownists differed from the Episcopalians mainly regarding ecclesiastical order and discipline, for their theological opinions were generally conformable to the Articles of the Church. Their doctrines and church government very much resemble those of the English Independents of the

resemble those of the English Independents of the present day. (See INDEPENDENTS.)

BRUCIA, or BRUCINE, bru'-se-d, an alkaloid coourring in large quantities in conjunction with strychnis in the strychnes nur vomica. It is less marked in its 
properties than strychnis, which it closely resembles, 
It crystallizes in colourlesss transparent rhombio 
prisms, which are insoluble in other. Its poisonous 
properties are less active than those of strychnis. By 
the action of nitric sold of brucia, compounds are abproperties are less active than those of stryohnis. By the action of nitric acid of brucia, compounds are abtained which render it probable that methyl enters into the composition of this alkaloid. (See STRYGENIA)

BRUCITE, bru-site, a fibrous hydrate of magnesia,

#### Brumaire

converting in allky greyich or bluish-white masses. A name given to choodrodite or chrysolite.

Barnann, bru-massy (Fr. brume, 10g), the name given to the second mouth of the year in the French resolutionary calender. It commenced on the 23rd of October and ended on the 21st of November, thus comprising thirty days. It received its name from the forsitat usually prevail about this time. The 18th of Brumpire, VIII. year (9th of November, 1799), is cele-

brated for the overthrow of the Directory and the stabilishment of the sway of Napoleon.

Burning of the sway of Napoleon.

Lauring of the sway of Napoleon.

anat. ord. of directledonous plants in the sub-class control for the sway of Napoleon.

They are small heath-like shruhs, found Colpeifore. They are small heath-like shrubs, found at the Cape of Good Hope and in Madaguscar. Their

properties and uses are unknown.

Bernorian Streem of Medicine, bru-no'-ni-da,
was founded by Dr. John Brown, a Scottish physician,
was founded towards the end of last century. His
system is explained at large in his "Elementa Medicina," published in 1780. It found numerous supporters, and gave rise to much opposition. According to him, the characteristics of life are sensation and motion; the capability of being affected by external powers is termed excitability; the agents are simil, or excitage powers; the result is excitement. When the affinable act upon the excitability with a sufficient stimule act upon the excitainty with a sufficient degree of power, there is a pleasant sensation of health; when they raise the excitement above this point, or depress it below it, disease takes place; and when the stimule cease to act, or the system to feel their power, death ensues. The stimuli are of two external and internal; the external being heat, light, air, food, medicines; the internal, the functions of the body, muscular exertion, powers of the mind. Exotement is life, and the body has an uncessing tendency to dissolution, which is only opposed by the societant application of excitement. All stimuli, by a sting upon the excitability, tend to exhaust it. Our asting upon the excitability, tend to exhaust it. Our our excitability,-of wasting it by day in labour and enjoyment, of recruiting it by day in labour and enjoyment, of recruiting it by night by the abstraction of all stimulating powers. All diseases are of two kinds—astkenic, or diseases of weakness, or debility; and sthenic, or diseases of excess of strength. His mode of treatment of treatment of the strength of the state of the strength of the strength. mode of treating diseases, therefore, had for its object morely the increasing or diminishing of excitement, without regard to their particular symptoms. The doctrine, in its original form, may be considered as exploded; but more recently a sect has arisen, principally in Rally, who profess a modification of the Brunomian system, and who are known as Modern Brunomians. They advocate what is known as the contra-stimulant mode of treatment of disease.

BEDEAFWICK GREEN, brand-wik, a pigment con-sisting of oxychloride of copper, formed by exposing supper dippings to the action of hydrochloric acid, or astrong solution of sal-ammoniac, in the open air.

BRUSHES, BRUSHMAKING, brush'-es (Fr. brosses; ex. bursten), instruments used for painting or for removing dirt by light rubbing, from floors, furniture, &c.
They are generally made of hair, bristles, or whalebors,
and are divided into two chases,—simple and compound
Simple brushes are composed of a single tult, and
compound brushes consist of several tufts inserted in c handle. Painters brushes are examples of the after kinds of simple brushes are known by the name of pencils, and are made of camel or sable-hair, in-acreed in quills of different sizes. When coarser and stronger material is used, they are generally mounted in the tabes, and known by the name of tools, the larger these being bound round sticks with string or copper Linds being bound round sticks with string or copper wire. After these come whitewash brushes, which consist of two or more large tufts fixed side by side on a disk handle, and secured firmly with string or wire. Company of the same of the same that a number of tufts are inserted into holes perforated at regular distances in making brushes to the description, the workman takes a tuft of a size corresponding to the hole; holding it compactly tocorresponding to the hole; holding it compactly to-getter, he dies it into a mixture of melted pitch and bellow, and then binds that end firmly with a piece of atrong thread called a thrum. He then dips the bound and take the pitch and tallow again, and inserts it with

## Bryonia

a peculiar twist into one of the holes. The pitel mixture sets rapidly, and the tuff is very firmly secured Hearth-brushes, bunister-brushes, and other bouse brooms, are all made in this manner; the lighte kind of dusting-brushes are also made equilarly. most important substances used in making brushes are bogs' bristles. In the brushes above mentioned the bristles are used the full length, but when brushes are wanted for hard rubbing or sambling, they are est short. In these short-baired brushes the tuite are generally inserted by the druwn method. In this process the back of the brush is bored in a similar manner to that described, after which a smaller bores manner to that described, after which a smaller beyer is used, and the perforation carried right through the stock. The brushmaker then takes a smaller number of bristles than will fill the hole, and attaches their ends to a fine wire, which is passed through the hole in the stock and drawn tight up to a knot. He then passes this wire, which is very flexible, through another hole, and forms another knot, and so on till a row is completed, when he cuts off the ends with a strong pair of shears furnished with a gange, which regulates pair of shears furnished with a gauge, which regulates the length of the tuft. The back of the brush is then covered with a thin piece of wood as a veneer. Toothbrushes and ivory brushes are often made with silver wire which is left visible; and sometimes the tufts are held in their places by a process called trepanning, The ends of the wires in trepanned work are secured the ends of the wires in trepanned work are secured laterally. For making soft brushes, such as hatbrushes, goal's-hair, and other kinds of hair, are much used. The process of drawing in the coarser description of brushmaking is performed by men, but women are largely employed in the manufacture of fancy brushes, and the selecting and cleaning of the bristles. The value of the brushes and brooms exported from this country in 1956 was £37,041.

BEUSH-TURKEY (Tolegalla Lathomi). called also the wattled tailegalla, inhabits New South Wales, from Cape Horu to Moreton Bay. It is about the size of a common turkey three parts grown. The whole of the upper surface is of a blackish-brown, the feathers of the chest edged with silvery grey. The skin of the head and neck is of a deep red, and the neck is ornamented with a bright yellow wattle. The most curious circumstance connected with the brush-turkey is, that it does not, like other birds, hatch its eggs by sitting on them, but collects together an immense heap of decaying vegetable matter as a depository for its eggs, and trusts to the heat evolved during the process of decomposition for the development of its young. This heap is gradually collected by the bird for several weeks previous to the period of laying, and is sometimes so large as to contain two or three curtleads. Savs Mr. Gould: "The mode in which the materials composing these mounds are accumulated is singular; the bird never uses its beak, but, grasping a quantity in its foot, throws it backwards to one common centre; thus clearing the surface of the ground completely for a considerable distance round. The heap being accumulated, and time allowed for a sufficient heat to be engendered, the eggs are deposited, not side by side, as is ordinarily the case, but planted at the distance of nine or twelve inches from each other, and buried, at nearly an arm's depth, perfectly upright, with the large end upwards. They are covered up as they are laid, and allowed to remain till hatched. I have been credibly informed, both by natives and settlers living near their hounts, that it is not unusual to obtain no bushel of eggs at one time from a single heap; and as

they are delicious cating, they are eagerly sought after."

BRUTE, brute (Lat. brutus), a term applied to those animals which act by instinct only, in order to distinguish them from men, who act by reason. It is synonymous with the word beast.

BRYACKE, bry'-ai-se-e (ir. brac, I sprout), in Bot., Urn-mosses, a sub-ord, of the Moss fame, distinguished by the sporangium dehiscing transversely, either from the separation of the operculum or in an irregular manuer. (See Musci.)

BRYGAUSS, brig'mate (Gr. brucke, I grind my testh), in Med., is the grinding of the teeth, or that grashing and chattering of the teeth which takes place in egelepsy and other convulsive disorders.

BRYONIA, bri-o'-ne-a (Gr. brue, I sprout), in Bet . e

## Brypm

gen. of plants belonging to the nat. ord. Cocurbitaces. The most interesting species is B. dioloa, the red-berried bryony, or wild vine, as indigenous perennial, growing in hedges and thickets, and blossoming during the month of May. The flowers are yellowish-white, with green streaks, and are discious; that is, the male and ismale flowers are borne by distinct plants. The stems are put forth annually, and climb by means of tendrils. The root is large, white, and is cold by her balists under the names of white bryony and mandrake-root. (For the true mandrake, see MANDRAGORA) The root contains a peculiar bitter principle, termed Bryonia. It is u violent emetic and purgative, and is highly poisonous, giving rise to symptoms much resembling those of cholers. It is stated to be frequently used by quack doctors in the country, and is employed as a topical doctors in the country, and is employed as a topical application to bruises. B. alba, Americana, and Afria, have similar properties.

BRYUM, brit-was, in Bot., a gen. of Mosses in the sub-ord. Bryaces. The species are very numerous, and many of them are natives of Britain. Their stems are short, and their leaves form tiny rosettes, from the

centre of which the fruit-stalks spring.

Buses, but-size, a South-African plant, found growing in the Maravi country by Dr. Livingstone. It affords a remarkably strong fibre, which is used by the natives for stringing beads upon. The botanical characters and relations of the plant have not yet been ascertained.

BUBBLE, bub'-bl (Du. bobbel), a small vescicle or bladder of water, or any other fluid inflated with air or

BURBLE, is a cant name for a strong bubbling male liquor.

BUBBLES, a name given to fraudulent or unsubstantial commercial projects, which hold out prospects of speedy gain, for the purpose of enriching the originators at the expense of ignorant and sanguine speculators. The term is generally applied to those schemes in which the funds are raised by the sale of shares, or by a subscription to a transferable stock. The name was first given to undertakings of this kind at the time of the South-Sea project. By this notorious scheme, capital to the amount of three hundred millions was involved. The Bubble Act (6 Geo, I. c. 15) entirely prohibited, the formation of companies by gambling in transferable stocks, or by the sale of shares, stating that they had "manifestly tended to the common grievance prejudice, and inconvenience of great numbers of his Majesty's subjects in their trade and commerce." The Bubble Act was repeated by the stat. 6 Geo. IV. c. 91; and the projectors of bubble companies are now only punishable, when they can be found guilty of fraud and conspiracy, at common law.

Buno, beer bo (Gr. boulon, the groin), in Med., de-notes a swelling of a lymphatic gland, particularly those of the groin or armpit. It may arise from mere irritation or some local disorder, in which case the bube is termed sympathetic; or it may arise from the absorption of some irritating matter, or from con-stitutional causes.

BUBONOCKLE, in Med., is a term applied to inguinal hernia. (See HERNIA.)

Brocat, buk'-kil (int. bucca, the check), in Med. denotes of or belonging to the check; as, the buccal arters, which is a branch of the internal maxillary; the buccal glandules, small mucous glands, or follicles, situated within the cheek, under its lining membrane.

BUCCANELES, but uners, a class of pirates who infested the coasts of the West Indies and South America in the 16th and 17th centuries. The term is The term is derived from a Caribbee word, bonean, which was applied to the flesh of cattle cured in a particular manner. The natives taught the process to the colonists, and the French, who adopted the word, formed from it the verb boscaner, and the noun boscanier; whence our term buccaneer. The buccaneers owed their origin to term buccaneer. The buccaneers owed their origin to the jealousy of the Spaniards, who refused to allow any other nation to settle or trade in that part of the world. Enterprising adventurers of other countries worm. Enterprising accenturers of other countries were naturally averse to submit to this, and the cruelties that were practised against those that dared to make their appearance there, were such that the adventurers formed themselves, about 15% into an association, not merely for natural defence, but for car-

#### Buchanites

rving out aggressive operations against the f fact were principally English and Prench. n a state of constant warfare, carrying on ho independently of peace or war at hom frequent descents on the coasts, pundering stroying the weaker towns and settlements. their principal settlement for some time on th of St. Kitts, and afterwards on Tortuga, near St. mingo; and, when not engaged in traffic with Indians, or in excursions against the Spaniards principal occupation was the hunting of wild ea which they made boucan. At a later period, man them became logwood-cutters in the Bay of Camp The Spaniards, however, continued to harass and most der them wherever they were to be found, and the enmity between them, instead of subsiding, only became more intense. By degrees, many men of good birth joined them, usually under an assumed name. The history of these men abounds in deeds of daring and high valour, but is also marked by deeds of reing crucity. Among the great leaders whose names figure in the history of buccaneering are the Franchman Monthars, called the "Exterminator;" Peter of Dieppe, called "Peter the Great;" and Henry Morgan, a Welshman, afterwards knighted by Charles II. and made deputy-governor of Jamaica. A high s and made deputy-governor of Jamaica. A high states of honour seems to have existed among them, and it is said that holts, locks, and all kinds of fastenings, were prohibited among them, as implying a suspicion of their honour. In 1670 a treaty of peace was consciuded between England and Spain, which provided for the extinction of the buccauser warfare, but with little success. The war between France and Britsin, after the accession of William III. in 1698, affected what treaty could not accomplish by causive a disacafter the accession of William III. in 1688, affected what treaty could not accomplish, by causing a dissociation of the ancient alliance, and a war between the two parties. The treaty of Ryawick, in 1897, and the accession of a French Bourbon prince to the throne of Spain four years later, brought about the final suppression of the buccaneers. After their appression, a race of pirates, of a much more dangerous and desperate character, arose, and for a number of years preyed upon the commerce of all nations, until stilling the state of the state length they were hunted down and exterminated. The name given to the buccaneers by the French is generally filbustiers, apparently a corruption of the English word freebooters, and whence the Americans have their term Filbusters—Ref. Burney's History of the Buccaneers; Dampier's Foyagas; and the Narrotices of Water, Ringrove, and Sharp.

Buccinaton, buk-si-nai-tor (Lat. buccina, a trumpet), in Anat, is a muscle of the cheek, so called from history brought much into play by trumpeters.

being brought much into play by trumpeters.

BUCCINUM. (See WHELE.)
BUCCINUM. (See WHELE.)
BUCCINUM, bu-sen'-taur (Gr. bons, an ox, and
entauros, a centaur), was the name of the state galley an ox, and of the republic of Venice, in which the doges annually, on Ascension-day, "married the Adriatic." This our



RUCKSTAME.

tom is traced to a naval victory gained on Assensionday, 1177, by Doge Sebastiano Ziani over the emperor Frederick Barbarosas. The pope presented Ziani with a gold ring as a sign that on that day the Advistic had been subjugated to Venice, "as a spouse to her husband." Annually, on Ascension-day, the degs, with great pomp and ceremony, and with a numerous attendance, proceeded in the Bucentaur, and deopped a gold ring into the Advistic, with these words. "We wed thee with this ring, in token of our true and perpetual sovereignty." When the French took Venice, what is said to have been the ancient Bucentaur was what is said to have been the ancient Bucestaur

BUOMANITES, buk'-da-ifee, the name of a sect of rall-

gious fanstics which sprang up in the west of Scotland shout the year 1783. The iounder of the sect was a Mrs. Elizabeth Buchan, the wife of a potter in Glasgow, who, from slight sherrations, at length gave herself out to be the woman spoken of in Bevelstion with the sained over to her behief the Rev. Mr. White, minister of a Belief congregation in Irvine, and many of the inhabitants of Irvine were induced to become followers. White was represented as the man child born of the woman. They went from house to house explaining the Surptures, praying, and testifying that the end of the world was at hand, and that it was the dusy of every Christian to abandon the concerns of time, and to prepare for the reception of Christ. Such proceedings led to popular turnilts, and she and many of her followers were expelled from the town in May, 1783. They found a settlement at Clesetown in May, 1784. They found a settlement at Close-burn, Dumfriesshire, where they remained for some time living in daily expectation of being translated to heaven; and on one occasion their leader conducted them to the top of a hill, from which they were going to be taken up to heaven; but, after waiting for a con-siderable time, they had to return disappointed. After siderable time, they had to return disappointed. After this many of them left the society, and Mrs. Buchan herself died in 1792; but there still remained a few survivors, the last of whom died in 1846.

BUCSU LEAVES. (See Barosma.)

BUCS, but (Sax. bucca), the male of the fallow deer. A buck is called a fawn in his first year; a

pricket in his second; a sorel in his third; a sore in his fourth; a buck of the first head in his fifth; and a great buck in his sixth. The female of the buck is termed a doe. The term buck is also applied to the male of the goat, sheep, rabbit, and hure. The male of the red deer is termed a stag, or hart, and never called

a buck. (See DEER, STAG.)

Bucknown, buk'-hound, a kind of dog formerly very common in England, but comparatively rare now. It was used exclusively for buck-hunting, and closely resembles the staghound (which see). Many varieties

of bounds, beside the buckhound, are now used for deerhunting.

BUCKER, buk-ing (Ang.-Sax.), in Min., is a term applied to crushing ore by hand on a plate called a bucking-plate, by means of a flat-headed hammer.

BUCKLER, buk-ler (Fr. boucier), a shield or weapout of defence worn on the left arm. It was of dif-

ferent sizes, and made of different materials. It was attached to the arm by two straps, one of which passed over the fleshy



BUCKLER

part of the forearm below elbow, and the other was grasp-ed in the haud. The Roman spearmen wore bucklers about four feet long by two in breadth, slightly curved in form, behind which they crouched before or after hurling the javelin: it WAS made

wood, strengthened with leather and metal plates and bosses. In medieval times the buckler was a generally round or oval. The Scotch target was a mokler of bull's-hide, ornamented with a rim, boss, ad stads of metal: it was used to catch and turn away the blow of a sword or lance, and always formed part of the equipment of a Highlander.

Bycsaan, but a nignander.

Bycsaan, but am (Fr. bongram), a sort of strong, coarse lines cloth, gummed, calandered, and dyed several colours. It is employed in drapery, garments, &c., when they are required to be kept stiff in a particular form, and also for making wrappers to cover beles of merchandise.

Browsers, buk-kin, a name given to a strong, twilled woollen cloth, generally used for making trousers. It is highly milled to the width of twenty-seven inches, and the pile or map is so finished as to show the taxture through it. It has doubtless obtained its name from its strength and toughness, and its resem-blance in these respects to leather made from the skin of a buck.

BUCKTHORN. (See RHAMNUS.)

BUCKTROEN. (See RHAMNUS.)
BUCKWHEAT. (See RHAMNUS.)
BUCKWHEAT. (See FAGOFIEUR.)
BUCKULCS, Jew-kol-lks (Gr. houkelika), properlymeans pastoral, pertaining to cattle, and is the name
given to a species of poetry which was common among
the ancient Greeks, but has been little cultivated by
the moderns. It represented rural affairs, and the life
and manners of shepherds. The prema of Theooritus,
Bion, and Moschus, and the Ecloques of Virgil, are of
this class. The metre employed is the hexameter, or
heroic; but the lines flow more easily here than in
epic poetry.

epic poetry.

Bro, bud (Du. bot.), in Bot., the organized rudiment of a branch or a flower. Buds which produce leaves, and have the power of extending into branches, are called leaf-bude; while those which produce flowers only, and are ordinarily destitute of this power of extension. receive the distinctive appellation of flower-buds. Theoretically considered, however, a flower-bud is merely a modified leaf-bud; for all the different parts of a flower may be regarded as altered leaves. A leaf-bud usually originates in the axil of a previously-formed leaf, the terminal bud of a branch being no exception to this rule. Every leaf has one or more of these organs in its axil, either in a rudimentary or perfect Whether lateral or terminal, each bud consists at first of a minute conical cellular mass, which com-municates with the cellular tissue of the stem or branch. Around this, spiral and other vessels and wood-cells are soon developed, and these are also connected with similar parts of the wood. Outside all, in a cellular substance, which ultimately becomes the bark, the rudimentary leaves are developed. By the growth of these parts, a little conical body is produced, which, under favourable circumstances, develops into a branch resembling in every respect the parent axis. In temperate and cold climates, the buds, which remain dormant during the winter, are generally covered with modified leaves, called scales. These protective organs are usually of a hardened texture; sometimes they are covered with a resinous secretion, as in the borsechestnut and several species of poplar; and sometime. they have a dense coating of soft hairs, or down, as in some of the willows. Buds thus protected are said to be saily. In the buds of tropical regions, and those of herbaceous plants which are never exposed to the cold of winter, such protective organs would be useless, and are accordingly absent. These buds are distinguished as naked. In a few instances, even buds of perennial plants growing it cold climates are maked, like those of tropical plants; such is the case with the alder, and with the buckthorn. Within the leaf-bud the future leaves are often very curiously folded, or rolled up, and the different positions which they assume are highly characteristic of different kinds of plants. The arrangement of the leaves in the bud must not, therefore, be overlooked by the practical botanist. (See VERNATION.) A leaf-bud may be removed when young from one plant and grafted upon another, by the process of badding, so as to continue to form its different parts: indeed, in some instances, it may even be made to grow in the soil immediately after removal. In certain cases, moreover, leaf-buds are naturally detached during the life of the parent, so as to form independent plants, and thus propagate the species.
On this account they have been called fixed embryos by some botanists. They are, in fact, embryo plants fixed to the axis, capable of sending stems and leaves in an upward direction, and woody fibres, which may be considered as roots, downwards. A tree may second ingly, be said to consist of a series of leaf-buds attached to a common axis, or trunk. In ordinary trees, in to a common axis, or irunk. In ordinary trees, in which there is provision made for the formation of numerous lateral leaf-buds, any injury done to a few branches is easily repaired; but in palms, which only form central leaf-buds, and have no provision for a lateral formation of them, any injury inflicted on the bud in the axis is extremely likely to have a prejudicial effect on the future life of the plant. Leaf-buds are sometimes extra-axillary; that is to say, they are occasionally developed in other positions besides: the axil of leaves. Such buds are somed admirity. the axil of leaves. Such buds are termed adventitions

or abnormet. The woody nodules, called embryo-buds, seen in the bark of the beach, alm, and other trees, are looked upon as partially-developed abnormal buds, in which the woody matter has been hardened by the in which the woody matter has been hardened by the pressure of the surrounding tissue. The nodules sometimes form knots on the surface of the stem; at other times they appear as large excrescences; and in some cases twigs and leaves are produced by them. Adventitious buds are produced naturally on the edges of certain leaves, and on the surfaces of others. These are capable of forming independent plants. Similar bads may be made to appear on the leaves of General, Oldering, and Achimens he wanning various care. Ends may be made to appear on the loaves of Genera, Glazinia, and Achimenes, by wounding various parts of them, and placing them in moist soil: this is the method often pursued by gardeners in their propagation. Flower-buds, like lest-buds, are ordinarily axillary, being produced in the axil of floral leaves or bracts. They cannot be used for budding, for they always die when removed from the parent stem. (See LEAP, FLOWER BULE.)

BUDDINGS, bud'-dizm, a religious system which prevails over a great part of Asia, and is said to have a greater number of adherents than any other religious system among mankind, amounting, according to some goographers, to four hundred millions, or about a third part of the human race. The system is said to have originated in India, about 600 years before the Chris-tian era; but in the land of its birth almost all traces of it have now disappeared. It is the prevailing religion, however, of the inhabitants of the high table-land north of the Himalayas to Siberia, of China, Japan, India beyond the Ganges, Ceylon, and several islands of the Indian archipelago. The founder of the system is said to have been a prince of the name of Siddhartha, son of Suddhodana, king of Kapalavastu, which was somewhere on the confines of Nepaul. He is called by numerous names, but the principal, that of Buddhs, is the wise or suligitated does not seem to have i.e. the wise or colightened, does not seem to have been given to him till after he appeared as a teacher of been given to him till after he appeared as a teacher of religion. In China, Buddiha has been corrupted into Pu-ta and Fo. He is said to have been equally distinguished for great beauty of person and high mental endowments. He early gave evidence of a serious and contemptative disposition, and in order to drive away this, his father surrounded him with all the pleasures of a gay and luxurious court. At the age of twenty he married a charming princess, by whom he had two children, a son and a daughter. Earnest thoughts of the depreciate and misery of human life. however, conthe depravity and misery of human life, however, continue to engage his attention, and he conceives the idea of retiring from society and living in solitude; guards are set over him to prevent his escape; but he tallength succeeds, and takes up his abode on the banks of a river called Arnasara, or Narasara. He was now about thirty years of age, and he remained therefor six years, spending his time in devout meditations. He would, it is said, remain for weeks plunged in deep abstraction, attempting to solve the mysteries of life, death, sin, goodness, wisdom, and such-like.

At length he is enlightened, and comes forth as a religious teacher of others. He first appears at Warnashi (Benares), to propound his new doctrines; and for upwards of forty years he continued to preach his system, traversing a great part of northern India, combating the Brahmins, and making numerous converts. He died in the eightieth year of his age, after making lived to see his doctrine spread all over India. For several centuries Buddhism seems to have continued to flourish in that country, and to have been tolerated by the Brahmins. At length, it seems to have contributed a long-continued persecution, which ultimately had the effect of entirely expelling it from the country where it had originated. What was the cause or the nature of these persecutions is turknown; but the ast traces of the system disappear about the 11th or 12th century; but by this time it had taken firm root in other parts, where it still continues to flourish. Numerous remains of Buddhist temples are scattered over India; and, during the period of persecution, when they were driven from the cities, they retired among the hills of the west, and there constructed stands are seasing the period of persecution, when they were driven from the cities, they retired over India; and, during the period of persecution, when they were driven from the cities, they retired over India; and, during the period of persecution, when they were driven from the cities, they retired over India; and, during the period of persecution, when they were driven from the cities, they retired over India; and, during the period of persecution, when they were drived and period of the containing water in which the ore is washed.

Buddied (Ang.-Sax.), in Min., a trough or blants belonging to the nat. ord. Serophularinovez over India; and, during the period of persecution, when they were drived in the containing water in which the ore is washed.

Burdley (Indiana and many there flower flower ing strubs, and the banding-knife has a point like a lancet, and the handle generally terminates in a thin invertible to be the other flower ing strubs. The budding-knife has a point like a lancet, and the handle generally terminates in a thin invertible to be decised for their graph of the other flower flower flower fruits in general; also for rose and many other flower fruits in gen verts. He died in the eightieth year of his age, after having lived to see his doctrine spread all over India. For several centuries Buddhism seems to have continued to flourish in that country, and to have been tolerated by the Brahmins. At length, it seems to have endured a long-continued persecution, which ultimately had the effect of entirely expelling it from the country where it had originated. What was the cause or the nature of these persecutions is unknown; but the sast traces of the system disappear about the 11th or 12th century; but by this time it had taken firm root in other parts, where it still continues to flourish. Numerous remains of Buddhist temules are anothered

the almost complete absence of dogmas or ritual is, or rather was,—for it has been much corrupted other creeds, an essentially moral system. Its objective other creece, an essentially moral system.

was to teach man how to attain to a pure and holy life in the case of Buddha admits and names a number of the Brahman cal gods, but he sets the Supreme Intelligence above them. The ritual or worship is extremely simple, consisting in offering flowers and perfume, the tepcat-ing of sacred formulas, and the singing of brains. The temples contain only an image of Buddha and a Dagoba, temples contain only an image of Buddha and a Dagoba; or shrine containing his relies. There are no priests or clergy properly so called, but only an order of monks, who have given themselves to a life of sanctity, and who are generally very numerous. They are obliged to live in celibacy; but they may retire from their order if they desire it, and are then permitted to marry. The four sublime verifies, or axioms, upon which the system of Buddhism is built, are—1, that there exists pain; 2, that the cause of pain is desire, are the attemption of the soul towards extrain objects. or the attachment of the soul towards certain objects; or the attachment of the soul towards certain objects;
3. that pain can be ended by Nirvana; and 4, the
way that leads to Nirvana. By the practice of six
transcendant perfections,—alms, morals, science, energy, patience, charity, a man might hope to arrive
at the state of Nirvana,—repose or annihilation. Existence is viewed as a curse rather than a blessing; and the endless transmigrations through other beings that had to be endured, were causes of suffering; and hence the highest object of desire was to be delivered from the necessity of being born again. There are trom the necessity of noing born again. Large are two words precepts of universal obligation; viz., not to kill, not to steal, not to commit adultery, not to list and not to be drunken. There are others for those entering upon a religious life. Ref. Manual of Buddhism, by R. S. Hardy; Introduction à l'Histoire du

sim, by R. S. Hardy; Introduction & l'Histoire du Buddhism Indien, by Burnout; Le Bouddh et ea Religion, by Saint-Hilbire; Edinburgh Review, April, 1862. BUDDING, bud-ing (from Du. bot, a bud), in Hort, a peculiar mode of grafting, in which a leaf-bud is used instead of a young twig or scion. The bud to be employed is cut out of the branch along with a small portion of the bark and young wood, and the woody part is then carefully separated. Two incisions are made in the bark of the stock intended to receive the bud, so as to form the letter T; the bark is raised on oud, so as to form the letter T; the bark is raised on both sides of the longitudinal cut, and the bud, with its shield of bark, is inserted in such a way that the upper edge of the shield joins exactly to the transverse cut in the bark of the stock. The leaf in the axil of which the bud grew is cut off, and the newly-inserted bud is for a while held in its place by strands of bass matting. If the bud is sufficiently matured, and if the bark at-If the bud is sumerency matures, and it are bud, at tached to it is properly fitted to that of the stock, the operation is almost sure to be successful. This is by far the most common method of budding. It is generally distinguished as shield-budding. Another method, raily distinguished as sneed-budding. Another method, called scallop-budding, consists in removing entirely a thin slip of bark from the stock, and fitting into the wound a similar slip bearing the bud. The proper time for budding is a little after midsummer, when the bud is perfectly formed. The process is particularly well adapted for trees which are apt to exude gum

## Bude Light

Buds Laure, buds, a very bright light, rivalling in brilliancy the electric and lime lights, made by arging a current of pure oxygen through the flame of an Argand gas-jet. It derives its name from the village of Buds, in Carawall, where it was first used by its

RUDGET, bud-jet (Fr. bougette), a bag or little sack, such as may be easily carried. It comprises also the contents of the bag or such, and hence has come to denote a stock or store of anything; as a budget of inventions. In parliamentary language, the budget is the financial statement laid annually by the chanreaction of the exchequer before parliament, of the esti-mated public income and expenditure for the follow-ing year, commencing on the 5th April, mentioning what taxes it is proposed to repeal, reduce, or aug-ment, and what new ones are to be imposed. In his speech on the occasion, the chancellor reviews the financial condition of the country, comparing the income and expenditure of the previous year with those of preceding years, justifying the changes that are proposed to be made, and estimating their probable effects. The statement of the chancellor is always looked forward to with great interest, and frequently gives rise to much excitement, as involving important

BUDNEANS, bud-ne'-due, in Eccl. Hist., a sect that arose in Poland towards the close of the 16th century, and took their name from their founder, Simon Bud-neus. They denied the divinity of Christ, and refused to worship him, adopting, also, many wild vagaries. Their founder was afterwards admitted into the communion of the Socinians, and his followers seem to have dispersed.

BUFF, or BUFFY COAT, buff, in Med., is a light yellow riscid substance, which is formed on the surface of blood drawn in certain states of disease.

BUFFALO, buf'-fa-to (Ital. and Span. bufalo; Bos bubulus).—This animal differs from the bison in having no hump on the back, and only a small dewlap on the no aump on the user, and only a man down, to breast. Besides this it carries no shock of hair about its neck and shoulders. They generally live in flocks of about a hundred, and affect marshy regions, both on account of the coarse but luxuriant vegetation there to be found, as well as the opportunity for a "mud bath, of which the buffalo is remarkably fond. The way he indulges this ugly predilection is singular: throwing himself flat upon his side in the mire, he shuffles round and round, the soil yielding to his immense weight the exudation of any moisture it may contain, morter covering him to his very eyes. When be emerges and has basked awhile in the sun, he looks like some hideous elack-baked clay image. This manouver, however, is not without purpose. Among the rank vegetation, and in the air, swarm millions of stinging Sies, and until the buffalo's mud coat peels off through long wear, he is as impregnable to their attacks as the slay image he represents. The buffalo is one among the very few animals who manifest no fear at the approach of the tiger; indeed, sportsmen concur that unless a tiger be full-grown and in possession of all his strength, will not venture to attack the bull buffalo. Should the tiger, made desperate by hunger, attack a herd of buffalces, his fate is certain. The whole herd will band segainst the common fee, and, assailing him with hoofs and horus, rend his striped hide to gory ribands, and trample him maimed and crushed into the mire.

Russes, buf fer, in Engin, a rod with an enlarged and attached to a spiral spring of great strength, fixed to the striking parts of locomotives and railway cariges, in order to diminish the shocks arising from

any sudden movement or stoppage.

Surveys, bog'-fai (Fr.), anciently denoted a small partment separated from the rest of a room, and need for containing china, glass-ware, &c. The name mass accountaining canal, glassware, ac. In the mine mass afterwards applied to a outpoard or set of shelves, which was used for a like purpose, but which has now been superseded by the modern sideboard. Buffet, or buffet stool, was also applied to a small wooden stool

American ozen and cows. They are dressed with oil

#### Buhr-stone

in the same manner as chamois leather. Buff teather is very plinble, and not liable to crack or rat. It is used for making bandolins, belts, pouches, gloves, and other articles.

Burra, Burra, boof fo, a term applied by the Italians to an octor and singer who takes the humorous and Indicrous parts in their operas. The epithet is also applied to the pieces themselves; as opera suffe, a comic opera

BUFFORT, buf-font', a projecting covering of gauze or linen for a lady's breast, an fashion in and after the year a period when English ladies' costume was very ungraceful. The buffont entirely concealed the neck and hosom, and stuck out from beneath the chin like the breast of a pigeon. It was generally accompanied by some other ugly articles of costume which were invented at that time. The figure in the illustration wears the buffont, the cumbrous head-dress, and the little frilled jacket, of that period. The buffont was worn in Paris as late as 1788.



BUFFORT.

Burroon, but foon' (Fr. bouffon; Ital. buffo), a low jester, a man who amuses others by rough tricks, antic gestures, broad jokes, and such-like. The name is said gestures, broad jokes, and such like. The name is said to be derived from the barbarous Latin word buff. (cheeked), a name given to those who appeared on the stage with their cheeks puffed up to receive blows on them, and thus to excite the laughter of the spectators. In Italy the term is not always used in a contemptuous sense: there there are two sorts of buffouns,—the buffo cautante, who has frequently an important part to play, requiring considerable musical talent, and the bidlo comico, whose part consists more in acting. In England the name was sometimes applied to those persons who were employed as fools at court or at the

tables of great men.

Bug, bay (probably Welsh bag). — This tiresome insect is too well known to need a devotion of space to its description. It is commonly asserted, though with what degree of truth it is hard to say, that before the year 1670 the insect in question was unknown in England, and that it was imported from America with the timber that country furnished for the rebuilding of London after its destruction by the great fire. Its blood-sucking propensitier, and the disgusting smell it emits when excited, are in these days no wonder amongst us. The female bug deposits her eggs at the beginning of summer: they are small, white, and of an oval shape, each being fixed to a hair-like giutinous stalk, ready to adhere to anything it touches.

Bugus, bu'-gl (Ang. Nor.), formerly a brass instru-ment without any keys, used only by hunters and for military purposes; within the last few years, however, it has been so much improved by the addition of six keys, that it now is of the greatest service both in solo and concerted music, and is very commonly found in orchestral and military bands. The bagle, when played with taste, forms a delightful accompaniment for the piauoforte, and possesses the advantage over most other horus, of a methodical fingering, by which the true tones can be produced without so much recourse to the car as would otherwise be necessary.

Bugloss. (See Archusa.)

BUHL-WORK, or, more properly, BOULE-WORK, bool, generally used as a footstool.

Bury Learnes, but lead or contracted from but for the lides of lead of leaster made from the hides of Boule, a famous French cabinetimeker of the time of lafficions, or from the salted and dried hides of South Louis XIV.

BURE-, BURER-, or BURE-STONE. boor a name often

#### Building

# Building en Pice

to certain quartrose rocks the worked surfaces of which possess the property of catting or grinding. They are used principally as millistones. The best kinds are creamy white, with a granular and somewhat cellular texture, and are obtained in the tertiary form-cities of the Paris basin and the surrounding district. They are cut into wedge-shaped parallelopipeds called anes, which are bound together with iron hoops to

form large milistones.

form large muscores.

Building, bit-ding (Sax. byldan, to build).—By this term is understood the art of putting together certain materials, such as stones, bricks, timbers, slates, &c., wrought into various necessary forms, for the purpose of constructing dwelling-houses and other editices required for public or private purposes. In building, the builder practically carries out the ideas of the architeet, who contrives the plan of the required edifice, that it may be well fitted for the purpose for which it is intended in every respect, and be suitable for the locality in which it may happen to he placed. architect also furnishes the builder with working drawings of the various elevations of the edifice and vertical sections of different parts, the form of the roof, ground-plans of the several floors, plans of the staircases, and drawings in detail of ornamental portions of the exterior and interior, drawn exactly to a certain scale. He also gives the builder specifications of the materials to be employed in the construction of the building, and the manner and form in which the materisls are to be applied; and to do this, it is necessary that the architect should have a practical as well as theoretical knowledge of the strength and durability of the different materials used in building, particularly timber, and the forms and arrangement in which their capability to resist pressure and tension can be employed to the greatest advantage. The builder, having carefully examined the plans and specifications provided by the architect, enters into an agreement to perform the work required for a certain sum, under-taking it by "contract," as it is termed; or he binds himself to execute it at certain valuations for different parts of the work; that is to say, at so much per perch for walling in stone; so much per rod for brickwork; so much per square for rooting, flooring, and paving; so much per foot for woodwork of different kinds, &c. charging for the work by what is called a "schedule of prices;" in which case it is measured after its completion by persons appointed by the architect to value what the builder has done, and it is paid for according to their valuation. During the progress of the building, the work is superintended by a "clerk of the a competent person acting under the architect's orders, to see that the builder faithfully follows the specifications; using good materials, and applying good workmanship, through the agency of mechanics in his employ who are well skilled in the different branches of constructive building. In building, particularly with reference to dwelling houses, great attention should be paid to the following points :- The situation should be such as will insure freedom from damp, and protection from north-easterly and easterly winds; the principal apartments should have, if possible, a western or southern aspect; the ground on which the house is built should be of a nature to secure a good supply of water, and a sufficient fall for drainage; and the posi-tion of the doors and windows should be regulated in a manner relculated to secure freedom from draughts manner rescansed to secure precion from arranging said emoky chimneys, which is to be obtained by ascertaining the direction of the winds to which the dwelling will be chiefly exposed. The method of construction adopted in the various component parts of buildings of a public and private nature, will be found on reference to their respective headings, as well as notices of the various styles of architecture and ornsmental details, and plans resorted to in building with mental debats, and plans resorted to in building with different kinds of material. (See the articles Auch, Architecture, Arrival, (See the articles Auch, Brown, Brickwork, Building en Pisk, Building-Grone, Carbenter, Cellar, Chimney, Coping, Derige, Architectural, Done, Door, Fireproof Buildings, Fide, Foundation, Gallery, House, Johnson, Tarway, Marshey, Massager, Massager, Massager, Parsware, Parsware ERBS, FIDER, FOUNDATION, GARDINEY, PAINTENS, PAPER-TAMBUNGS, PLASTERING, ROOF, RUSTICATED WORK, SCAPPOLBING, STATE, STATECASE, STUCCO, SMOKE, SEWER, TIMBER, TILING, WALL-PLATE, WINDOW, &c.,

&c.) The large contractors, as the late Mr. T. Cabits, Messus; Lucae & Kell, the contractors for the great Exhibition building of 1982, and others of equal adob-rity, employ machinery worked by steam power in the manufacture of various ports of buildings, which to to insure great accuracy of fitting when the part which tond are put together; and, indeed, there are certain particularly in the metropolitan districts, who emp thomselves entirely in the manufacture of parts parts of a house, such as doors, windows, &c., by my chinery, which greatly facilitates the operations of the builder, particularly if they he on a small scale, cost him considerably less than they would if he had purchased the material and employed artisans to execute the material and employed artisans are material artisans are material and employed artisans are material and employed artisans are material artisans are ma cute the required work. The more machinery can be brought into operation, the chapper buildings can be raised; and hence the advantage and greatly increased rate of profit that accrue to contractors whose espital rate of profit that accrue to contractors whose cepitas; enables them to exect machinery to accomplish the construction of different parts of their work. It is said that progress in the art of building, in different localities, is always controlled by the material that can be most readily procured in the neighbourhood, said that greater architectural beauty, convenience, and elegance, are attained and shown in cities where stone, the contractor of the property of the contractor of the profit of the contractor of the contractor of the profit of the contractor of the contractor of the profit of the contractor of the co that can be easily worked, can be had in the immediate vicinity. The truth of this is certainly evinced in the numerous magnificent structures in stone that are to be seen at Rome, St. Petersburg, Paris, Vienna, Brussels, Edinburgh, Glasgow, New York, and other European and American cities; but, in the present day, it has been shown that much can be effected in brickwork in every way, as exemplified in the buildings lately erected in that material in and around London, Manchester, and Liverpool; and a still higher degree of perfection will be obtained when more attention is paid to the production of coloured or polychrome bricks, and the brickwork is so arranged as to obtain the juxtaposition of broader masses of colour, that will present a more pleasing effect of contrast or harmony than can be found in the intersection of walls of one colour by single stretching-courses of another, few and far between, or the formation of the straight or camlar between, or the formation of the straight or cambered arches above doors and windows by alternative wedges of colour, just the thickness of a brick. The most beautiful and pleasing buildings in the world may be produced in brickwork, if the dressings, coins, and ornamental details, be formed of clay, coloured and moulded to suit their position in the building, and this architect be animated by the taste and feeling of an artist in consume the coloured materials to require the coloured and the coloured materials to require the coloured and the coloured materials to require the coloured and t artist in grouping his coloured materials together.

BUILDING ACT FOR LONDON AND ITS NERGEROUS-HOOD. (See METBOPOLITAN BUILDING ACT.)

BUILDING EN PISE, a method of building walls with compressed earth, which has been practised in France for a long period of time, perticularly in the southern part of the country, about Lyons. Walls built or this plan somewhat resemble the old "cob" walls of mud and straw, of which barns, cottages, and garden-walls were sometimes made in agricultural districts in various parts of England; but they are more durable, more finished in appearance, and better calculated to withstead the weather from the matter durable. which the weather, from the method adopted in raising them. The foundations of the walls are made of stone or brick, and are raised a short distance above the level of the ground. Earth is then procured, which is neither too hight from containing too much sand, nor too heavy from the presence of clay in gre sand, nor too neavy from the presence of casy in green quantities, but which consists of rich soil, sufficiently moist, with a little fine gravel in it. This is rammed into a solid mass on the top of the foundation, being kept in the proper shape and position by a sort of mould formed of two boards, that are held apart by iron bolts and screws to the extent required for the thickness of the wall, and are removed as soon as the portion of wall hatween them is completed. The wall portion of wall between them is completed. portion of wall between them is completed. The waith is made in courses a few inches in depth, and the earth is added in smul quantities at a time, that every portion of the wall may be well bestes together. The face of the well on the exterior, and the interior as well, if required, is thus formed:—the earth that is next the boards forming the mould, is taken out, and a space left, about an inch or two in depth, between the board and the main part of the wall, which is filled.

## Building Leases

with a facing composition formed of three parts of earth and one part of lime, mixed together with water like morter, but showed to dry, and reduced to powder before it is rammed in. It hardens and forms a solid coating, which keeps the core of the wall free from moisture. To avoid settlement from shrinking of material, all the bond timbers and pieces of wood placed in the walls are made as thin as possible, and the openings for doorways and windows are formed by inserting frames of thick plants in the required posi-tions and resuming the activities. meeting frames of thick planks in the required posi-tions, and ramning the earth closely against them as against the sides of the moulds. The walls may be whitewested or coloured, and smoothed by a wooden instrument used by plasterers, which gives them a very next appearance. They are very durable if protected from damp as much as possible, as walls of this descrip-tion have stood in France for more than a hundred and appears a sound as when they were first years, and appear as sound as when they were first built; and the durability of the cob-wall, without any external facing, is well known. As the material costs nothing but the expense of bringing it to the spot where it is to be used, the cost of buildings constructed in this way is very low in comparison with that of houses of stone and brick. Mr. Robert Salmon, of Moburn, Bedfordshire, who has creeted many buildings in this way, found that the cost of a square yard of wall built en pise was only one fourth of that of a square yard of brickwork in that locality, if finished with facing composition on one side only, and onethird, if fluished on both sides.—Ref. Transactions of the Society of Arts, vol. xxvii.; English Cyclopadia— Arts and Sciences.

BUILDING LEASES. (See LEASE.)

BUILDING SOCIETIES are in the nature of a jointstock company, established to raise a subscription-fund by advances, from which the members shall be compled to build or purchase dwelling-houses, or to purchase land; such advances being secured to the society by mortgage of the premises so built or purchased. They are established upon the basis of rules provided, to be sanctioned under the provisions of the acts relating to friendly societies, and they are made subject in general to those acts. The members become shareholders by The members become shareholders by paying an entrance-fee and binding themselves to make a periodical subscription, for the most part, by monthly a periodical succerption, for the most part, by monthly payments. The non-payment subjects the member to a fine limited by the rules. The members are either investers or borrowers. When the fund ruised is large enough to let out, loans are made to the borrowers, and so from time to time, as subscriptions are paid in, fresh advances are made. The borrowers thus anticipate what they would otherwise receive on the termination of the society. In general, the money borrowed cannot be repaid in one sum, but only by the periodical subscriptions, the mortgage remaining a security for the payment thereof, and of the flues incurred through default of, or irregularity in, paying such subscriptions.

The loan and use of the money advanced being upon the
principle of compound interest, it follows that the term of the mortgage by repayment of the money, and, con-sequently, the duration of the company, must be limited to a given number of years. This term varies in different societies in proportion as the amount of subscriptions is greater or smaller, and generally ranges from ten to fourteen years. A society may, however, become permanent by the successive issuing of fresh shares; but the interest in and liability under, each share must terminate when the time arrives for the investing member to be paid the sum fixed by the rules in respect of it, or when the borrowing member has fully paid up his subscriptions. If the security taken by the society be good and ample, the invester would obtain his money at the expiration of the calculated time; but it frequently happens that losses arise on the calculated of the property under the mortgage, and the term between to the investers is postponed, and their interinguated benefit much reduced. If the society be rainable, it must follow, that as the time runs out, une of the investers must be paid off. The persons to be paid are determined by lot, or some other mode provided by the rules. The rules are settled and approved by a barrister, who is appointed to revise the rules of, and register, all benefit and riendly societies.

There are many kinds of stone

nd register, all benefit and friendly societies.

BULLIMIA, bul-i'-mi-i (Gr. bons, an or, and times, sed for building purposes, differing greatly in quality bunger), in Med., denotes an insatir us graving for

#### Bulimia

and durability. That which at present appears to be considered the best for buildings in which the stone is required to be wrought by the mallet and chisel into various ornamental forms, and retains, its marpness after exposure to the weather, is a magnesian limestone, a stone which consists of earboarde of limeatone, which was used for the new Houses of Par-A stone much used for the dressings and coins of buildings, as well as many other ornamental purposes, is an colitic limestone of a rich cream-colour; known as Bath-stone or freestone, which is quarried in the vicinity of Bath and the Isle of Portland. Dartmoor, in Devenshire, and in Scotland, in the neighbourhood of Aberdeen and to the north of that town, granite is obtained, which is hard and difficult to work, but which is well calculated for paving stresss and building bridges, and for the basements of public buildings, from its great durability. Sandstones of various kinds, such as the old and new red sandstone, green-stone, and basalt, are also used, and the lime-stone found at Purbeck, in Dorsetshire, on the coast of Devonshire, and in other parts of Great Britain, which furnishes handsome slabs of black, red, and grey marble, veined with white, which are cut and polished for mantelpieces, &c. The chemical composition of the various kinds of building-stone, the causes which lead to their deem, and the vergesses well is prefert lead to their decay, and the processes used to protect them from the action of the weather, will be found under their respective headings. (See Basalt, Gram-ite, Limestone, Oolite, &c.; Stone, Perservation

BUKKUM-WOOD. (See Creatrinia.)

Bull, bulb (Lat. bulbus), in Bot., a shortened stem or branch, usually subterranean, bearing on its surface a number of fleshy scales, which are modified leaves. It is only found in monocotyledenous plants, and is seen in the byacinth, bly, and onton. The built may be looked upon as a subterranean leaf-bud, arising from a shortened axis. From its centre an herbaceous stem arises, and from the subterranean axis new bulbs, or cloves, as they are cailed, are produced. Every new

bulb is formed in the axil of a scale, like a bud (which see); sometimes it remains attached to the parent bulb, and sends up an axis and leaves; at other times, it is detached in the course of growth, and forms an inde-pendent plant. The new bulls feed on the parent one, and uitimately cause its complete absorption. The scales are generally thickened by the deposition of nutritive matters, in-In the onion, equill, and leck, these scales are covered externally by thin membrancus coats or tunics; hence the bulbs are said to be tunicated. When the membranous coats are ab-



BULD OF

When the membranous coars are absent, the build is said to be maked or acaly, as in the white high. The colid rounded underground stem, called by botanists a corm, is commonly regarded as a bulb. (See Court.)
Bellius, or Bullius, half-bils, in Bot., small conical or rounded bodies produced in the axil of the leaves of some monocotyledonous plants, and which are of the nature of build. They can be readily disare of the nature of buibs. They can be readily distinguished from ordinary leaf-bads by their fleshy character. They are easily detached from the perent stem, and, when placed in favourable circumstances, they produce new individuals. They may be seen in Lilium bulbiferum, Dentaria bulbifera (corai-wort), and

Bulgarian Language, bulgai'-ri-da, is a branch of the Sclavonic, and is divided into two dislects,—the old and new Bulgarian. The old Bulgarian is the richest in inflections, and its literature is the oldest of any of the Sclavonic tongues. The new Bulgarian has arisen since the destruction of the kingdom in 1392, when the language came to be mixed with those of neighbouring nations, particularly of Wallachia and Albania. The new Bulgarian can scarcely be said to possess any literature; but it has a large collection of ropular acres.

#### Bulkhoad

food. Persons labouring under this disease feel all the effects of hunger, even when the stomach is full and the stories that are told of the quantities of food consumed in such cases are scarcely credible. The real consumed in such cases are scarcely creatible. The resi-nature of this disease is very imperfectly known. In some cases, the health appears to be otherwise good; but usually bulimis is a concomitant of other dis-cases. Its consequences are learness, pulmonary fevers, consumption, dropsy. Sometimes there exists are extended and residually appears to the system has been much exhausted, or from a certain condition of the stomach, which causes it to digest the food with too great rapidity; but these do not indicate disease,

but only excessive appetite.

Bukuran, bulk-hed, in Mar., a name given to certain partitions built up in several parts of a should between two decks, either lengthways or across, to form and separate the various apartments. Some of those which are built across the ship are remarkably strong. Those which inclose the magazine are of oak plank, and rabbeted, as are those of the spirituous-liquor room. Others in the hold are generally oak plank, cyphered, to keep the gravel or dirt of the sulfast from getting into the storerooms, or into the well to damage the pumps. Water-tight bulkheads well to damage the pumps. Water-tight bulkheads are iron partitions running athwart the hold. By means of these, the body of the vessel is divided into several water-tight divisions. Hence, if the vessel is leaking in one part, the rest may remain dry till the injury is repaired. Nearly all large vessels are now injury is repaired. Nearly all large vessels are now made with these buikheads. The Great Bustern has ten of them, reaching nearly to the level of the upper deck.

BULL, bull, a term applied on the Stock Exchange to those brokers who contract to buy any quantity of stock or shares, without having the intention or ability to pay for them, and who are, therefore, obliged to sell again, either at a profit or a loss, before the time at which they have contracted to take it. It is the consents of lear facility.

it. It is the opposite of bear (which see).

Bull (Du. bulle), in Zool., the male of the Bos or hoving gen. of quadrupeds, of which the cow is the

female.

Bult, in Lit., denotes an equivocal expression, a blunder, a contradiction, errors to which the Irish are particularly liable. "I confess it is what the English call a bull, in the expression, though the sense be

manifest enough. — Pope.

Bull, Golden, is the name given to an edict or imperial constitution granted by the emperor Charles IV., and regarded as the Magoa Charta of the German empire. It received its name from the scal attached to it being in a gold box, and was granted by the emperor at an imperial diet held at Nürnberg in 1356. This bull regulated the form and ceremony in the This bull regulated the form and ceredinally in the election of emperors, determined the number of electors, with their functions, rights, privileges, &c., all of which were previously undetermined. It comprised thirty articles, and the original is still preserved at Frankfort-on-the-Maine.

BULL, PARIL (Lat. bulla, a seal), is a written letter issued from the Roman chancery by order of the pope, and scaled with lead. The bull is, strictly speaking, only the seal or pendent lead, which alone gives the document its authority. It is impressed on the one side with the heads of St. Peter and St. Paul, and on the other with the name of the pope and the year of his pontificate. Bulls are written in old Gothic characters, upon stout and coarse parchment, and are granted for the consecration of bishops, the promotion to benefices, celebration of jubilees, &c. They are either bulls of grace or bulls of justice; in the former the seal is attached by a cord of silk, in the latter by a cord of hemp. Bulls are distinguished from brieves both in form and character. The latter are more abcool in form and cuaracter. The latter are more abbreviated in their form, are written upon flue parchiment in Boman characters, are issued by the apostolic secretary, and sealed with red wax. Brieves are of the same authority as bulls, though issuing from different same suttoons as ourself and the government, both being equally re-departments of the government, both being equally re-garded as acts of the pope. The Bull in Carna Domini is a particular bull which was read every year on the day of the Lord's Supper, or Maundy-Thursday, in the presence of the pope, containing excommunications and anothernes sgainst heretics and all who disturbs

### Bull-dog

oppose, or disobey the Roman pontiff. After the bull was read, the pope three down a burning torch in the public place, to denote the thunder of this austhema. The reading of this bull was discontinued by Chement XIV. In the Middle Ages bulls were also used by kings and emperors in great affairs of state. In affairs of the greatest importance, golden bulls were employed; silver, leaden, and waxen ones being made use of in matters of less moment.

BULLA (Lat. bulla, a round boss or stud), a small round ornament made of gold or silver, worn by the children of the ancient Roman nobility. The bulls was work until they arrived at the age of fourteen, and was placed upon the neck or breast. It was a distinctive

mark of free birth.

Bulla, a genus of molluscous animals with univalve shells, whose general characteristics are,—that the shell is sub-oval, that the aperture is oblong and shell is all the conselled. The smooth, and that one cud is a little convoluted. The animal breathes by gills, but has no respiratory tube, and consequently the margin of the aperture of the shell is entire. Most of this genus, especially of the larger sizes, are furnished with an organ succely re-

larger sizes, are furnished with an organ exactly resembling the gizzard of a fowl, and which they appear to use for the purpose of masticating their food.

BULLAGE, bull-laise, the English name of a kind of plum, the Prunus institute of botanists. (See PRUNES.)

BULL-BATTING, bull-built-ing (Du. bulls, bull; Gotts, bull; Gotts, bulls, bull; Gotts, bull; Gotts, bulls, bulls, bull; Gotts, bull; Gotts, bulls, bull; Gotts, bulls, bull; Gotts, bulls, bull; Gotts, bull; Gotts, bulls, bull; Gotts, bull; bull; Gotts, bull; bull; Gotts, bull; bull; Gotts, bull; bull

beitan, to bait), is the harbarous sport of bailing bulls with dogs. The animal was usually tied to a stake, with the points of his horns muffled, and then attacked by the dogs, who tore him to death for the amasement of the spectators. It is said to have been introduced as an amusement into England about the year 1209.

BULL-DOG, bull'-dog (Canis molosous), a variety of the dog, remarkable for its broad, short muzzle. It is generally looked upon as an essentially English dog; hut there is a doubt as to whether it has not existed as a definite race since the time of the Romans, or whether it is not a recently-formed variety. of mastiff. It is smaller than the mastiff, and has a massive head; the forehead sinks between the eyes, and the nose-line rises again at a considerable angle; the lower jaw projects in a remarkable manuer beyond the upper, continually showing the teeth; the lips are thick and pendulous, the neck strong and thick,



BULL-DOG.

and the legs short. The projection of the under-jaw and the livid redness of its eyes give the buil-dog a fierce and forbidding aspect, often heightened by a designing leer, which seems natural to the animal. The strength and courage of bull-dogs are proverbial. They will attack any animal, utterly regardless of its strength and size. They were formerly much used for bull-builing; since the abolition of which sport, the breed has decreased in numbers. One of these dogs will seize an ox by the nose, and, with apparent case, hold him still, or throw him on his side, as he is ordered by his masters When trained for the purpose, they fight very savagely with one another; and in cert in of the mining and manufacturing districts of

#### Bullet

England this sport is still carried on. On growing old, the bull-dog becomes very vicious and dangerous, often inflicting severe bites on the slightest provocation. The bull-terrier is a cross between the dog and the terrier. It is, if possible, more closs than the bull-dog itself. It is, if possible, more fero-

BULLET, bull-let (Fr. boulet), the name given to sany kind of leaden missile which is discharged from a ride, fowling-piece, or pistol. Prior to the introduc-tion of the various kinds of modern rifles with barrels furnished with numerous spiral grooves, the bullet a molten state into a mould, the diameter corresponded with the calibre of the weapon for which it was intended. For the old rifle with two deep grooves in the interior of the barrel, the bullet was carronaded with a projecting rib, and was made by casting the lead in a grooved mould. Builets of all chapes are now made by compression, a method inflartely superior to that of casting them, as there can be no irregular cavity or air-hole in any bullet formed by pressure, a thing which would seriously affect the fight of any projectile, and cause it to fall wide of the mark, on account of the eccentricity of motion that would be imparted to it, arising from the vavity causing it to be lighter on one side than on the other. The first attempt to form bullets by compression was made about 1840, by Mr. Napier, whose machine was adopted by the government and used at Woodwich. It by the government and used at Woodwien. It was worked by steam power. Strips of lead, first subjected to heavy pressure under rollers to produce condensation of the metal, were passed under a machine by which they were pressed into longths resembling. strings of nearly round pieces of lead. These lengths vere then passed between hemispherical dies, or plungers, which closed on each piece with great force; when the dies receded from each other, the bullets were ejected by springs, which noted on plugs in the dies, and came out in the form of a perfect sphere, connected, however, by a small piece of metal, which was removed by the action of a punch worked by a treadle, under which the bullets passed in succession. The old round bullets were from 14 to 20 to the pound; the calibre of the weapons for which they were in-tended varying from 60 or \$ of an inch to 68 or \$7 of an inch. The spherical bullet is now entirely superseded by conical clongated projectiles of various forms, the principal of which is that used for the Enfield-Pritchett rifle. This bullet is spherical at one end and remonet the. I'ms others spherical at one and and hollow at the other, which is next the powder when the musket is loaded. The cavity is in the form of a fruncated cone, and extends into the bullet pretty nearly half its length. A little boxwood plug, about half the depth of the cavity in height, is fitted into the end of the bullet, leaving a small hollow space in its interior between the ping and the bottom of the cavity. When the powder explodes, this wooden ping is driven deeper into the cavity, and causes the lead, which presents the form of a tolerably thin ring at the flat presents the strike of expand and fit tightly into the grooves of the rifle, by which windage is prevented, and the securate flight of the missile towards the mark insured. There are many kinds of bullets of the concal form, with numerous contrivances for obtaining expansion at the moment of discharge, but they are too numerous to mention here in detail. The principal are those made by Minie, Delvigne, Norton, Robins, Beaufoy, Manton, and Greener. The Minió bullet somewhat rescribes the Enfield; but it is pointed at the upper ends and of being hemispherical, and the cavity at the legislation of the being hemispherical, and the cavity at the legislation of the lower end, which answers the same purpose as the wooden plug in the Enfield bullet, causing the expension of the lead into the grooves of the rife. Mr. Greener was the first who made a bullet on this principle, in 1833, and received a reward of £1,000 premapes, in 1853, and received a reward of £1,000 from government for his invention in 1857. The Enfeld bullets are made by compression in machines which draw the lead into them in the form of rods and ent them into pieces of the proper length, which are stamped or pressed into the required form by four steel dies with which each machine is furnished. Each machine will furn out about 190 bullets nos miner. ent them into pieces of the proper length, which are black predominates; the back is achievey; breast and stamped or pressed into the required form by four belly dusky red; wings and tail black; upper tail steel dies with which each machine is furnished. Each machine will turn out about 120 bullets per minute. resembles the male, except that her colours are less

#### Bullanen

The boxwood pluge, which are inserted into the cavities of these projectiles, are also cut by machinery.—Ref. Busk's Rifle and does to use it, and Mandbook to Hythe; Coles's Catechiem of Masketry.

Bullett's, bull-let-in, is a term derived from the French, where it originally signified a ballot used in

elections; and hence a small piece of paper on which one gave his vote. Alterwards it came to signify an official report, giving an account of the actual con-dition of some important affair intended for the information of the public. When kings or other persons of high rank are dangerously ill, daily bulletins are issued by the physicians respecting the state of the patient. In time of war, builetins are issued by the generals, announcing the state of an army or the result of a battle. This practice became common in the French army under the first Napoleon.

BULLET-THEE, or BULLY-THEE, a tree supposed to belong to the gen. Mimusops, in the nat. ord. Supotaceae. It is a native of Guiana, and much valued for its tim-ber, which is hard and durable. It yields a delicious

fruit about the size of a cherry.

BULL-FIGHTS, or combats between men and bulls, are a very ancient kind of amusement, and were common in Greece several centuries before the Christian era. In Rome, under the emperors, they were also common, and alterwards they became popular in many of the other countries of Europe. At present Spain is the only country in Europe where they are still held. In Madrid and all the larger towns of Spain bull-fights In Madrid and an the mager common open are frequent. In Madrid the season lasts from April to November, during which time bull-lights take place at least once a week. The combats are held in a large at least once a week. The combats are held in a large amphitheatre called the Plaza de toros, open at the top, and with sents rising one above another round the circle, and capable of accommodating from 10,000 to 12,000 spectators. The area is divided into an outer and an inner circle, separated from each other by a strong fence, the latter being the place where the combats take place, the former affording shelter to the men on foot when hard pressed by the bull, in order to which there are a series of openings in the fence just large enough to allow a man to pass through. The actors on the arena are the bull, usually of the fierce Andalusian or Castilian breed; the picadores, or combutants on horseback; the landeritleros, who are armed with sharp goods with coloured attenuers; the childs, who weat very bright-coloured clocks; and the matador, who dispatches the buil. The contest begins with the picadores, who are each around with a lance, and mounted usually on a very worthless horse. Their object is to wound the bull with the lance, and then to avoid his onset. The horse is frequently gored in the encounter, and when a picador is closely pressed, the banderilleros and chulos rush in and withdraw the bull's attention by pricking him with their darks and waving their clouks. When the bull begins to flag, the picadores withdraw, and are succeeded by the banderilleros, who are armed with banderillas, or darts, about two feet long, ornamented with a coloured flag. the banderillero sticks into the bull be and the horns when it is preparing to toss him. After a time the third act of the play commences, and the manador enters upon the stage, attended by some chalos as assistants. Over his left arm he has a red mantle, behind which is concealed a sword which he has in his right hand. He awaits the charge of the bull, and, if well skilled, dexterously plunges the sword between the shoulder and the blade, and the animal drops dend at his feet. Twenty minutes is the time usually taken to terminate the contest, and eight or ten bulls are often dispatched in a single day.—Ref. Ford's Handbook of Spain.

BULFINER, bull'finsh (Ang.-Sax.), (Loxia, pyrrhula), a song-bird common to all parts of England
and Europe generally. It is about the size of the common hedge-aperow, but of bulkier build, and rather
more than a third of its length is monopolized by its tail.
The bill is short, strong, and of a blue-black colony.
On the upper part of the head, round the base of the
beak, and forming a chin-shaped patch beneath, jet
black predominates: the back is ash-crey: breast and

## Bull-Frog

distinctly marked, and her under perts are rather russet than red. The builfinch has acquired considerable calebrity from the facility with which it learns to whistle airs. Training builfinches to "pipe" is a mode of making money frequently practised in Germany: considerable pains are requisite. There was one Ger-man bullfinch-teacher, named Lewis de Berg, whose



BULLFINCH.

turds were sold for their weight in gold. "I feed the wrote he; "I give "maller birds with rape-seed." them likewise, at times, a little bruised rice soaked in comary wine, and afterwards dried carefully for use. Though giving the hird a few grains while wet with this

excellent liquor does mighty well, yet it does not do to be constantly practised. — Ref. Beeton's Home Pets.

Bull-Frac (Rana nipicus), the largest of the species Rana, or Frags. It is generally six to eight inches long, exclusive of the feet, and four inches broad. is an inhabitant of North America, particularly of the southern states. At a distance, its voice resembles the lowing of a bull; hence its name. The fore feet of the bull-frog are unwebbed, and have only four toes; but the hind feet, which are long, are webbed very widely. Its colour is a dull olive, marked irregularly with dark stains; the belly, however, is of a pule green colour, thickly spotted. The bull-frog frequents green colour, thesity spotted. The building frequents springs only where the constant running of water has made a deep pool. Scarcely a spring of this description is without a pair of these frogs. When surprised, with a spring or two they leap into their retreat. They prey on young ducks and geese, which they swallow whole; it is also believed that they keep the springs in which the resident and the springs in

which they reside wholesome.

Bullhard, or Miller's-revens, bull-hed (Cattus golio), a small fish, common to our brooks and rivers. It is about four inches long, with a large roundish head, and a capacious mouth, formidably filled with teeth. It is generally found under loose stones at the bed of the stream, and is seemingly so insensible to danger, that, should half a dozen of them be lying together, the invenile angler may capture the whole by continuing to drop in his bait till they are all hooked. The term bullhead is considered to refer to the large size of the head, and the name of miller's-thumb is doubtless applied because of the resemblance of the same part to the thumb of a miller, which, like this fish's head, is smooth, and broad, and rounded, a form produced by a peculiar and constant action of the muscles in the exercise of his occupation. The miller's hand is constantly pisced under the meal-spout, to ascertain the quality of the grinding. The thumb, by a particular movement, spreads the sample over the fingers, and serves as a gange of the value of the produce.—Ref. Yarrell's British Fishes.

BULLION, bull-yon, properly signifies uncoined gold and sliver, or, more strictly, refined gold and sliver in bars or other masses; but in political economy the term is frequently used to denote the precious metals both coined and uncoined. The word is said to be derived from the French billow, base coin, from the currency in France having been much debased by the sings. There are numerous interesting quill be found needed with the subject of bullion, which will be found treated of in different parts offenis work (as Bankino, 1 treated of in different parts of the still an open question CURRENCY, MONKY, &c.). It is still an open question what effect a great increase in the supply of the presions metals would have upon the value of money.

## Bungalow

The great increase in late years of gold, brought in America and Australia, has at least had no percept effect in that respect. At the Bank of Engls all builion of the standard fineness offered for must be bought at the uniform price of 43.474.04 an ounce; at the Mint it is bought at the rate of 43.174.104d; but the seller must wait for payment until the bullion can be converted into money; and hence the former mode of disposing of it is the preferred.

BULL's-EXE, the black or gold mark in the centre

BULL-BYE, the black or gold BRIE in the country of a target. (See TARGET.)

BULL-TROUT, bull'-trout (Salmo Erioz, or Salmo priseus).—This fish, which is often called the Grey Trout in England, and the Sowen in Wales, is nearly allied to the salmon. It generally lives in the sea, but deposits that the country is not as elegant as that its spawn in rivers. Its form is not so elegant as that of the salmon; its head and neck are thicker, and its tail more bulky in proportion. The colour of the male is reddish brown,

and that of the female dark grey; their scales are smaller than those a salmon of of equal size. Anglers look upon the bull-



RULL-TROUT.

trout as ranking next to the salmon as regards sport. It is usually under 15 lbs. weight, but some attain a weight of 20 lbs. The flesh, which is lighter coloured than that of the salmon, is coarser, and has not so delicate a flavour.

BULRUSH, bull'-rush, the popular English name for any large rush-like plant growing in marshes. (See

BULWARK, bull-wurk, in a man-of-war, the bearding above the upper deck fastened to the outside of the timber-heads and stanctions. They protect the men in action from the fire of the enemy. In ordinary vessels they are simply a protection from the waves. and prevent articles from being washed overboard. If a sailing vessel has to be converted into a man-of-war, the bulwarks require to be greatly strengthened. The name of bulwark was formerly applied in mili-tary art to ramparts and bastions.

BUMASTUS, bu-mas'-tus, in Geol., a gen. of Silurian trilobites, remarkable for their oblong-oval or grapelike form. They occur in lerge numbers in the lime-stone of Barr, in Sialfordshire, and on this account are commonly called the "Barr trilobites."

BUMBOAT, bum'-bote, a kind of wherry, used in and about harbours, for carrying provisions for sale to ships lying at a distance from the coast. Bumboats are frequently called shore-boats, to distinguish them from those belonging to the vessels.

Buncu, bunch, in Min., a mass of ore too small and irregular to constitute a vem. When a mine is full of such masses, to the exclusion of regular veius, it is said to be buncky.

Bunganow, bun'-qd-lo, an East-Indian term for a sort of house or villa, with a thatched roof. They are occupied by Europeans, and very in size and accom-modation, according to the fancy or requirements of their owner. They generally consist of a ground-floor,



BUNGALOW.

surrounded by a verandale, but some are of two ste ries. In the principal cities of Bombsy, Madras, and Calentta, the bungalows of the wealther class of Europeans are spacious and nugnificent: the large

#### Bundon

number of demestic servants required by European residents are accommodated in affuoent offices. Public bungalows are for the reception of travellers, and are maintained by government. They are fitted up with rooms, beechambers, bath-rooms, tables, chairs, &c., for the use of which the traveller pays a ruper, that is two shillings, per day. The traveller himself is expected to come provided with food, drink, cooking utensils, bedding, and servants; but, in some of the better sort of hungalows, the khitmutgar supplies those necessary articles. The distance between the public bungalows is usually from twelve to fifteen miles, which is a good Indian day's journey. The introducwhich is a good Indian day's journey. The introduc-tion of railways will most probably effect a conversion in the public bungalow, and make it, in some measure, approximate to the English botel. Military bungalows for the accommodation of soldiers in cantonments,

and are on the same extensive scale as barracks.

Buylon, bun-yun (Gr. bounos, an eminence), in Surg.,
is a painful inflammatory swelling of the foot, most commonly about the root of the great toe. The pressure of tight shoes is usually the exciting cause; and, in order to remedy it, all such pressure upon the part should be avoided. Bleeding by leeches, warm fomen-

tations, or positives, should be resorted to, in order to remove the inflammation. The swelling may sometimes be considerably reduced by caustic.

BUNIUM, bu'-ni-um, in Bot., a gen. of plants belonging to the nat. ord, Umbelliferæ. The species are perennial herbs, with usually taberose and globose roots, square stems, compound leaves, and white flowers. B. flexuosum and bulbocastonum, both growing wild in this country, have edible tubers, which are commonly known as earth-nuts or pig-nuts. B. ferulaceum, a native of Greece, has also edible tubers, which are termed topana.

BUNKUM, bunk-um, is an Americanism, applied to speech delivered merely for the purpose of conciliating popular favour, or gaining popular applause; a species of oratory more commonly to be met with in erica than in most other countries.

Bunt, bunt, a disease of wheat and other grains,

BUNT, ount, a cisease of wheat and other grains, caused by a parasitic fungus. (See Unedo.)

BUNTER, ban-ter (Ger., variegated), in Geol., the term applied by the Germans to the new red sandstone of English geologists, in allusion to its variegated colours. (See Transsic System.)

BUNTING, or BUNTINE, bun-ting, a thin woollen

fabric, of which ships' flags are made.

Bunting (Emberiza), an interesting group of passerine birds, whose chief characteristic is a bill very strong, short, conical, and compressed laterally, but without any tooth or notch; the upper mandible is state palatal end, forming, as a whole, an instrument admirably adapted for breaking the rinds or shells of seeds, and ejecting them without losing any of the kernel. The Common, the Yellow, the Cirl, the Ortolan, the Snow, the Reed, and the Lapland, are the various distinguishing names of the British members of this family. Besides these there are the Painted bunting of South America, and the Yellow-shouldered bunting of the Cape. When the female of this last-mentioned species loses, through age, the faculty of propagating her kind, she throws off her comparatively modest attre, and appears, for the rest of her life, as splendidly plumed as her mate; and so exactly like, that it is simply impossible to tell one from the other without the minutest examination.

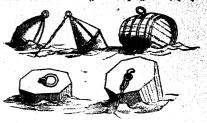
BUNTLINE, bunt'-lines, in Mar., are ropes fastened to cringles (small holes formed in the bolt-ropes of easils) on the boltcome of the square sails, to draw them up to their yards. They are inserted through sertiain blocks above or on the upper portion of the yard; whence, passing downwards on the fore part of the sails, they are secured below to the lower edge, in several places to the bolt-rope.

Brox. bof (Fr. bouts) in Mar. floating bodies con-

Buox, bot (Fr. bonée), in Mar., floating bodies con-tracted of any light buoyant substance, and used either to mark some danger (such as sauds and shoals) or to denote the position of a ship's anchor, &c. They gratitude; but, in addition, it does him the favour of see made in a great variety of shapes. Several of the varning him of the approach of the hunter. With its most ordinary forms are represented in the illustration. Brioge are sometimes placed so as to mark the after off, and at once shoots up in the air, uttering a sharp and peculiar note, which the rhivocerus is use

## Buphaga Africana

cases, as at Spithead, being put in a double line, so us to show the only safe course that a vessel can take. The principal buoys of this kind are under the superintendence of the Trinity House. This corporation has lately adopted a buoy invented by Mr. Harbert, which has the advantage of keeping nearly perpen-



THOUSE.

dicular in all kinds of weather. The bell-buoy is in-geniously arranged, so that any tide or current passing where it is floating moves an under-shot wheel, which rings a bell. It is thus rendered useful in a fog or at

BUOY DUES .- On recount of the importance of buoys in navigation, they are placed under several strict regulations. The Trinity House, under whose ju-risdiction most of the warning and directing buoys are distributed, claims certain dues from all ships entering ports where they are placed. These buoy dues are ports where they are placed. sometimes collected as a tonnage, varying from \$d. to 2d. per ton; sometimes as a payment on entering or leaving the port, and in some cases as a rate on the vessel. Many coasting ressels pay a yearly sum, whatever number of voyages they make. The buoys in the Thames alone bring in an annual rerenue of £11,000 to the corporation of the Trinity House. Buoy, Life. (See Life Buoy.)

BUPRAGA APRICANA, bu-fait-qu, a curious bird, about the size of a full-grown blackbird, distributed throughout Southern Africa, and likewise found in Senegal. Its common habit is to search for its food in the infested hides of wild animals of the ox genus, as well as the rhinoceros, though its vulgar name, rhinoceros-bird, would imply that it was exclusively at-



BUPHAGA APRICANA.

tached to that animal. Its clave are well adapted for holding on securely to its hairy and snimsted pasturage, and its bill is shaped like a pair of wire-drawer's pliers; so that the parasite, although, as is frequently the case so that the parasite, attnough, as in requesting the control buried in the skin, is easily extracted. "If it rendered the rhinoceros no further service than ridding it of these biting pests, it would deserve the saimal's gratitude; but, in addition, it does him the favour of warning him of the approach of the hunter. With its

# Buprestide

slow to understand and take advantage of. Cumming save to uncorretand and take advantage of. Oursming saverts, that when the rhimoseros is saleep and the buphage falls to wake him with its voice, it will peak the inside of his ear, and otherwise ever itself to rouse its thick-headed friend."—Wild Sports of the World.

Burnserns, bu-prestide (Gr.), a gen. of hard-shelled bestles, generally very beautiful in appearance. Green would seem to be their most ordinary colour, but many are of the richest azure, spangled with goldcolors; some are vivid red, and others of a glowing copper has. They are found on the trunks and branches of stees, and, when disturbed, will fall to the ground seemingly without life, and by this means frequently escape. There exist nearly five hundred of this genus, escape. There exist nearly five hundred of this geous, but not more than twenty are commonly met with in

this country.

Bur, Burr, or Barr, ber (Ang.-Sax.), a very small ridge raised on the edges of lines that have been cut on a plate of metal by the action of the graving tool or dry-point. It is generally removed by a tool called a scraper, as it gives a somewhat smeared appearance to impressions taken from the plate if it be allowed to remain. In plates engraved by Rembrandt the bur was not removed, and he managed to take

advantage of it to give additional effect to his etchings.

BURATITE, bu'-rd-file, a hydrated carbonate of copper, containing also sine and lime, occurring in the radiating needles at Chesey in France, and in the

Altai Mountains.

BURBOT, ber'-bat (Gadus lota), an eel-like fish found in many northern English lakes and rivers. It is said however, to attain greatest perfection in the Lake of

Geneva.

BURDEN, ber'-den, in Mus., is that portion of a song which is repeated at the close of every verse or stanza. It is derived from the French bourdon, a drone bass; because the one, like the other, is characterized by the same unchangeable tone, and bears upon the cur with the same monotony. The adoption of a burden with the same monotony. The adoption of a burden in youl music is very ancient, and it is still occasionally introduced with very pleasing effects.

BUEDEN, in Mar., denotes the contents of a vessel,

or the number of tons she will carry.

BURDEN (Ang. Sax. byrden, something borne), in Scots Law, denotes generally any restriction, limitation, or incumbrance, affecting either person or pro-perty. Burdens are thus either personal or real, personal when imposed on a person, real when imposed directly and specifically on heritable property. A proprietor may create a real burden by reservation in parting with lands; but it is essential that it be pro-perly expressed and declared to be a burden on the lands themselves.

BURDENSACK, bur'-den-sak, was a provision in the old law of Scotland, by which a man could not be punished for theft if he took as much meat as he could carry on his back, provided it was to satisfy the gravings of hunger. It is not now recognized in law.

Burry, bu-ro', is a term derived from the French,

and signifying a writing-table or desk; also an office denotes a department of government, and the term bureaueracy is applied to a government, and the term bureaueracy is applied to a government conducted by a series of independent departments, each under the apperintendence of a chief, to whom alone the officials responsible.

BURETTE, bu-ret (Fr.), a vessel used by che-mists for pouring out small and exact quantities of mints for pouring our small and exact quantities on solutions. Burettes are of various shapes, and are generally graduated. They consist essentially of a tube with a fine spout and an opening, which may be closed at pleasure with the thumb.—Ref. C. G. Williams's Chemical Manipulation.

BURGAGE TENURE, ber'-gatj, in Law, is an ancient tenure proper to boroughs, whereby the inhabitants, by custom, hold their lands or tenements of the queen, or other person, by a reat certain. It is, in-deed, only a kind of town-socage, as a common socage, by which other lands are holden, is usually of a rural mature. By the operation of the Enfranchisement

hature. By the operation of the intrancusement, Acts, this species of tenure is gradually diminishing. Bungues, beri-jes (Lat. burgeri). — Burgeses are properly men of trade, or the inhabitants of a borough or walled town; but the term is usually applied to the 377

Burgh Royal

maghtrates of such a town ; as the build and b of Leominster, &c. Before the statute 5 & 6 W; c. 76 (commonly called the Municipal Corpo 6. 26 (commonly cause the municipes approximately deliberated by the four-set for the precion, as there was generally acquired by birth, marriage, or stude, that is, by being born of a freeman, by mythe daughter or widow of a freeman, or by myproximate daughter or widow of a freeman, or by myproximately deliberated by myproximatel ship for seven years within the borough to a treem It might also be obtained by gift or purchase. In boroughs comprised in the act, the definition of a s gess (that is, a burgess entitled to such new rights as the act for the first time confers on these boroughs) is a male person of full age, not an alien, nor having re-ceived within the last twelve months perceival relief. ceived within the last tweive months paroccusar raise; or alms, or pension, or charitable allowance from the charitable trustees of the borough, who, on the last day of August in any year, shall have excupied any house, warehouse, counting-house, or shop, within the borough, during that year and the whole of the two preceding years; and, during such occupation, shall also have been an inhabitant householder within the borough, or within seven miles thereof; and shall, during such time, have been rated in respect of such premises to all rates for relief of the poor, and have paid all such rates, and all borough rates in respect of the all such rates, and all borough rates in respect of this same premises, except those payable for the last six calendar months; and shall be duly enrolled in that year as a burgess on the burgess-roll. Which definition, however, is to be understood as subject to the following rule,—that when the premises come to the party by descent, marriage, settlement, devise, or promotion to any benefice or office, he shall be critical to recken in the occurance and rating of be entitled to reckon in the occupancy and rating of be entitled to recken in the occupancy and rating the former party from whom they were so derived. (See 6 & 7 Wm. IV. c. 104, s. 7; 7 Wm. IV. & I Vect. c. 78, ss. 4 to 9, and 24; and Bosougn in loco. And as to the burgees-roll, see E. v. Hardwich (mayor), 19 Ad. & E. 60; R. v. Eye (mayor), 9 Ad. & E. 670.)
Burgen (Goth. bourge, a city), is a general name given to certain towns and cities in Scotland, and

corresponding to borough (which see) in England. There are royal burghs, burghs of barony, parliamentary

burghs.

burghs.
BURGH ACERS, in Scotland, are acres or small patches
of land lying in the neighbourhood of royal burghs,
usually feued out to, and occupied by burgesses, or
persons resident within the burgh. Statute 1935,
c. 23, concerning runridge lands, exempts burgh acres from division; but the exemption is confined to royal

BURGHERS, ber'-gers, in the ecclesiastical history of Scotland was the name of one of the two bodies into which the Secession church was divided in 1747. which the Secession cutren was divided in 1737. The cause of division was,—Whether it was lawful for seceders to take the burgess eath, professing the established religion and promising to maintain the same. The one party, the Burghers, held that their creed was identical in all material points with that of the established church, and that professing their belief in the one was the same as professing their belief in the other. The Antiburghers, on the other hand, maintained that the oath could only be received in the sense intended by those who administered it. The dispute was carried on with great acrimony for two years, and resulted in a separation. After the separation both sections rapidly increased, and though the animosity was maintained with great bitterness for some time, it began gradually to subside, and at length, in 1820, the two became again united under the name of the United Associate Synod of the Secession Church.
More recently they have become united with several
other bodies into the United Presbyterian Church (which see)

BURGH LAWS (Leges Burgorum), an ancient collection of laws relating to burghs in Scotland, now more

valuable to the archicologist than the lawyer.

BURGH OF BARONY, or BURGH OF REGALITY, is a corporation analogous to a royal burgh, consisting of the inhabitants of a determinate tract of ground within the barony, erected by the king and subject to the government of magistrates. The right of electing magistrates is vested by the charter of erection, sometimes in the baron or logd of the regality, and sometimes in the inhabitants themselves.

Buggu Royaz, a corporate body erected by charter

from the crown, conferring upon it certain powers and privileges. The corporation consists of the magistrates and burgesses of the farritory erected into a burgh. The magistrates are generally a provest and bulks, desi of guild, tressurer, and common conneil. There are 68 royal burghs in Scotland; and under the Reform Act, 23 of the 53 M.P.'s for Scotland are returned by the royal burghs. The election of magistrates is now regulated by 2 & 3 Will. IV. c. 76, and in burghs not royal burghs. royal, but contributing to return members to parliament, by 3.2.4 Will. IV. c. 77, and 4 & 5 Will. IV. e. 86. The act 16 & 17 Vict. c. 28, provides for the supplying of racancies in town councils of burghs conint on null and irregular elections. The police of Sequent on and and irregular electrons. The poince of burghs and other populous places, and the paving, drawing, cleaning, lighting, and improving the same, are regulated by 13 & 14 Vict. c. 33; and the 16 & 17 Vict. c. 38, enables burghs to maintain and improve their harbours. The exclusive privilege of trading in burghs is abolished by 9 & 10 Vict. c. 93. The transferior of recovery within burghs is resulted. mission of property within burghs is regulated by 30 & 11 Vict. c. 49. A convention, composed of commissions from each of the royal burghs, meets unmally at Edinburgh, with power to make regulations for promoting the trade and commonweal of the tracels. burghs.

Turgus.

BUBGLAEY, ber'-gld-re(Lat.burgi latrocinium), in Law,
mocturnal housebreaking, which, by our ancient law, was
called hamesecken, as it is in Scotland to this day. The definition of a burglar, as given by Sir Edward Coke is, "he that by night breaketh and entereth into a mausion-house with intent to commit a felony." The breaking and entering a dwelling-house by day, to steal property therein, amounts, however, to a felony. As regards the offence of burglary, by the 7 Wm. IV. & 1 Viet. 886, t.e. 4, the night is considered as commencing at nine in the evening, and concluding at six in the morning. It is generally applied to breaking into a mansion or dwelling-house; for no distant barn, warehouse, or the like, is under the same privileges; nor is a house in which no one resides, unless the inhabitant has only left it for a short season, animo revertendi. If the building broken into communicates with the dwelling-house. either immediate or by means of a covered and inclosed passage leading from the one to the other, the breaking into it is burglary. The offence extends to breaking into a room or lodging in any private house, the mantion for the time being of the lodger, if the owner doth not himself dwell in the house, or if he and his lodger enter by different outward doors; but if the owner himself lies in the house, and has but one outward door at which he and his lodgers enter, such longers seem only to be inmates, and all their apartments to be parcel of the one dwelling-house of the owner. There must be both a breaking and entry to complete the offence, but they need not be done at once. The breaking extends to taking out the glass of, or otherwise opening a window, picking a lock or opening it with a key, lifting up the latch of a door, or unloosening any other fastening which the owner has provided; or the introduction of any part of the body, or the insertion of an instrument, or stepping over the threshold, or putting in a hook to draw out goods, or a pistol to demand one'r money. If a person leave his door or window open, the entering is not a burglary; but if an inner or chamber door be also constitute the offence ; viz .- to come down a chimney, to knock at a door, and, on its being opened, to rush in with a felonious intent, or, under pretence of taking lodgings, or otherwise, to fall upon an inmate and rob him; a servant to open his master's chamber door with a felonious design, or any other person design in the same house, or in a public inn, to open him deather another's door with such evil intent; or a servent to conspire with a robber and let him into the house by night. There must be a felonious intent, while wise the entry, actual or constructive, will amount only to a trespare. The intent is a question for the jury Whosoever shall burglariously break and enter into any dwelling-house, and shall assault with intent to murder

than three years; and in case of imprisonment, hard labour and solitary confluenced may be apperaided. BURGOMASTER, OF BURGERMETERM, best-go-secr-ter, is the title of the chief magistrate in a municipal term in Holland and Germany, corresponding to the English mayor and the French maire.

BURGORET, 'bur'-go-net, a helmet which formed part of the armour worn at the close of the 17th century.

It was invented by the Burgundians, and from them received its name. All the armour of that period was richly decorated and fluted. The burgonet took the form of the head more closely than the helmets in previous use, and frequently had overlapping plates of steel that protected the neck. There There s a resemblance between the burgonet in the accompanying illustration and the singular helmet worn in the reign of Richard II. A serrated ridge usually ran from the summit, and a plume of feathers either stood up from the apex of the helmet, or one long flow-ing plume was inserted in



DURGONET.

the pipe at the back. This plume streamed behind the wearer, frequently descending lower than the waist.

BURGON LUSTRE, boor'-gos lus-ter, a certain method of gilding ceramic ware by the double sulphide of gold and potassium, prepared by heating gold in a fine state of division with sulphur and carbonate of potash.

BURGUNDIANS, BURGUNDI, or BURGUNDIONES, bur-

gun'-di-ons, an ancient Germanic race, originally in-habiting the country between the Oder and Vistola, about the present New Mark and the southern part of West Prussia. They were distinguished from the other Germansby living together in villages - burgens (whence perhaps, their name). Afterwards they were driven out of their territory by the Gepide, when they passed westward and settled in the region of the Upper Rhine. In the beginning of the 5th century they seitled, with other German nations, in Gaul, and established themselves between the Aar and the Rhone. They are said to have been converted to Christianity in seven days. From 407 to 534, the kingdom of Burgundy was barassed by internal as well as external dissensions, being sometimes under one king, sometimes under several. In 451, one of their kings, Gundicar, engaged Attila, but was defeated and slam. In 534, King Godemar was slain in battle, and Burgundy became a Frankish province. In consequence of the weakness of the later Carlovingian kings, the country, in the latter part of the 9th century, became once more independent; and from being the residential city of Boso, the first king, it took the name of the kingdom of Arles. After various changes, Burgundy became finally united to France, on the death of Charles the Bold without male issue, in 1477.

BUBGUNDY PITCH, bur'-gundy, a resinous substance used for making plasters. It is prepared from common frankincense, the resin of the spruce fir (Abies excelse), by melting it in hot water immediately after it has been scraped from the tree, and then straining it through a cloth. The resin is thus freed straining it through a cloth. The resin is thus freed from mechanical impurities, while it loses some of its volatile oil. The substance sold as Burgundy pitch is often a factitious compound, consisting of resur ren-dered opaque by the incorporation of water, and coloured by palm oil, or else a cheap preparation of concrete American turpentine.

BURIAL, ber'-ri-al (Ang. Saz. birgan, to conceal), the act of interring the body of a deceased person. Of the various modes of disposing of the dead, that of inhitdwelling-house, and shall assault with intent to murder mation appears to have been the most amoient, as it is any person being therein, or shall stab, cut, wound, best, or strike any such person, shall be guilty of felowy, and shall suffer death. For common burglary, the punishment is transportation for life, or not less than commonly practised among the Greeks and Romans, and appears to have derived its origin from the

dread of inhuman treatment to them after death; but the practice appears to have gone out of use during the Empire. Almost every nation has manifested a certain degree of solicitude and care in the disposal of their dead; and both in sacred and profane history we find that burial was regarded as a matter of the highest importance. Among the Jews the deprivation of burial was looked upon as one of the most disgraceful things that could befall a man; and the ancient Greeks and Remans believed that their souls would not be admitted into the Elviain fields till their ancient Greeks and Romans betieved that their souls would not be admitted into the Elysian fields till their bodies were committed to the earth. Among the meients burials seem to have generally taken place without the cities, and this practice was followed by the early Christians. At first they had no separate burying-places, but in the time of Gregory the Greet, who was bithop of Rome anno 590, inclosures arourd churches began to be employed for that purpose, at first exclusively for ecolesisatical dimitaries pose, at first exclusively for ecclesisatical dignitaries, but afterwards for any who died in communion with the Church. There is no instance on record of a formal consecration of a burial-ground before the 6th century; and burial within charches does not appear to have taken place previous to the 7th. Monuments with inscriptions in memory of the dead were early adopted. Rxcept in times of persecution, the Christians conducted their funeral ceremonies during the day; but in imitation of the heathens, they adopted the custom of carrying torches at their funeral processions. The body was conducted to the grave smid the singing of hymns, and the practice of singing on such occasions was thus defended by Chrysostom: "What mean our hymns? Do we not glorify God and give him thanks, that he hath crowned him that is departed, that he hath delihath crowned him that is departed, that he hath denivered him from trouble, and hath set him free from all fear?" "If thou believest the things which thou sayest to be true, why dost thou weep and lament, and make a mere mock and pageantry of thy singing?" It was usual to carry in the procession palm and olive branches, as symbols of victory and joy, and to burn incense. Laurel and ivy leaves were sometimes put into the coffin; but express was rejected, as being emblematical of sorrow and mourning. It was also customary to strew flowers on the grave. It was not unusual to celebrate the Lord's Supper at the grave; and they also fell into the error of commending the soul of the deceased to God in prayer. During the procession, the taba, or trumpet, was employed, or, in some cases, rattles of wood or iron. In the 8th century the toiling of bells was introduced. The distribution of alms at funerals was not uncommon. From an early period it was customary to deliver funeral orations in praise of the decessed. The primitive Church denied the more solemn rites of burial only to unbaptized persons, self-murderers, and the excommunicated, who con-tinued obstinate and impenitent, in manifest contempt of the church censures. In the same way the burial service of the Church of England is to be read over all but such as die unbaptized, or have committed suicide, or have been excommunicated. Funeral services, as remarked by St. Augustine, are designed rather for the comfort and benefit of the living than for the dead; and hence, when denied to any, it is chiefly with the view of testifying the Church's abborrence of certain offences and of inducing others to avoid falling into them. "This office is also denied to infants not yet admitted into the Church by baptism; not so much to punish the infants, who have done no crime, as the punish the initians, who have done no crime, as we parents, by whose neglect this too often happens."—(Hock's Church Dictionary.) The burial service of the Church of England is singularly appropriate and impressive. The rubric directs that the priests and clerks, meeting the corpse at the entrance of the churchyard, and going before it, either into the church or towards the grave, shall say or sing as is there suppointed. In Scotland there is no religious service

appointed. In Scotland there is no religious service at the grave, but usually a short service is held in the house of the deceased before the body is removed.

BURIAL ACTS.—In consequence of the overcrowded state of graveyards in the metropolis, an act was passed, called the Motropolitan Interments Act, 1850. This was repealed by the 15 & 16 Vict. c. 85, 1852. The object of the legislature was to effect a disconsinuate of interments and to empower

enforce regulations of a southery character. Several other acts relating to the subject have been agree passed, whereby the objects proposed to be carried out in the city of London were extended to the provinces. These sots are the 16 & 17 Vict. c. 134, the 17 & 12 Vict. c. 87, and the 18 & 19 Vict. cc. 79 & 128, and the whole are amended by the 20 & 21 Vict. c. 81, 12 Vict. c. 1, and the 23 & 24 Vict. c. 64. These are carried into effect by burial boards, which appointed in the manner prescribed by the leading statutes, and they are subject to the control of the secretary of state for the Home department and orders. of council.

BURIAL SOCIETIES. (See FRIENDLY SOCIETIES.) RUBIALS, REGISTRATION OF. (See REGISTRATION.) BURIN, but-rin (Fr. burin, a graving-tool), the na given to the instruments or gravers with which the engraver cuts lines on a steel, copper, or zinc plate in engraver cuts lines on a steel, copper, or zinc place in making an engraving. The size and shape of gravers vary according to the breadth and depth of the lines they are intended to produce. They are made of well-tempered steel, and are generally shaped like a four-sided prism, with the lower end ground obliquely to apoint; but for very fine lines a lozenge-shaped graver is used. The steel end is attached to a handle, and thus forms a food shout flar or six inches in length. In our terms a collabor flar or six inches in length. forms a tool about five or six inches in length. In cut-ting a line, the graver is pushed gently, but fixely, in the required direction, being held in such a position that it forms a small angle with the surface of the metal.

BURITI PALM. (See MAURITIA.)

BURKINO, burk-ing, murdering a person with the intention of selling the body for dissection. Before the year 1832 there were not sufficient legal means by which bodies could be procured for anatomical pur-poses. Previous to that time the prices for subjects became very high, and tempted men to commit some horrible crimes. Among these were two nen named Burke and Hare, who, as associates, are believed to have murdored no less than sixteen persons solely for the purpose of handing their bodies over to the surgeons. Burke was tried in 1823, at Edinburgh, Hare being received as king's evidence against him. Their practice was to decoy poor people, usually strangers, into their houses, and there smother them after making them drunk. Burke was convicted and hanged, and his name has ever since been given to the inhuman crime of which he was guilty. In 1832 au not was passed (2 & 3 Will. IV. c. 75), by which the supply of bodies for dissecting purposes was put under legal superintendence, and inspectors were appointed legal superintendence, and inspectors were appended to the various schools of anatomy. This act has proved sufficient to meet the evil for which it was intended. To burke a project or a speech comes from this word, and means bringing to a sudden end.

BURLESQUE, bur-lesk' (Ital. burlers, to jest, mock), denotes a style of composition in which the humour consists in a ludicrous mixture of things high and

low, of high thoughts clothed in low expressions, or vice versa, of ordinary or base topics invested in artificial dignity. The burlesque style may exist in conversation as well as written composition, and in acting and drawing. It is, however, most common in poetry. Burlesque appears to have been unknown among the ancients; but specimens of it are found in most modern languages, particularly the Italian. Butler's "Hudibras" is a well-known example in English of literary burlesque, and "Bombastes Furioso" of dramatic burlesque. In the composition of the burdramatic burlesque. In the composition of the burlesque-acting pieces which at the present time enjoy so large a share of popularity, a great decadence is exhibited when they are compared with the classical extravaganzas of Planché, and the smart burlesques of A Beckett, Albert Smith, and Robert Brough, which deserved popularity for their literary merits alone. The apparent aim of the modern burlesque writer is to succeed by means of female attractions and "breakdowns."

BURMANNIACER, bur-man'-mi-ai'-se-e, in Bot., the Burmannia fam., a nat. ord. of monocetyledonous plants in the sub-class Pataloideæ. This order is said. This was repealed by the 15 & 16 Vict. c. 85, 1852.

The object of the legislature was to effect a discontinuance of internural internents, and to empower are herbaceous plants, without true leaves, or with restrict to establish burial-grounds for parishes, and perianth tubular, regular, superior, usually with aix divisions; stamens inserted into the tube of the calyx, 3 or 6, distinct; ovary inferior, I celled with three pariets; placentus, or 3-celled with axile placentas; seeds numerous, very minute; embryo solid.
species have no important properties.

Bunnert Frizzs, Tru, bur-set, were founded by Mr. Burnett, a merchant in Aberdeen, who, dying in 1765, left a part of his fortune to found these prizes. The interest was to accumulate for forty years at a time, and was then to be divided and given, as two springs (of not less than £1,200 and £100), to the authors of the best two essays on "The evidence that there is a Being, all-powerful, wise, and good, by whom everything exists; and particularly to obviate difficulties regarding the wisdom and goodness of the Deity; and this, in the first place, from considerations independent of written revelation; and, in the second place, from the revelation of the Lord Jesus; and from the whole to point out the inferences most necessary and useful to mankind." On the first competition, in 1815, the first prize, of £1,200, was awarded to Dr. W. Laurence Brown, principal of Marischal College, and the second, of £400, to the Rev. J. Bird Sumner, afterwards second, of £300, to the Rev. J. Bird Summer, afterwards archbishop of Canterbury. On the second competition, in 1855, 208 essays were given in, the judges being the Rev. Baden Powell, Henry Rogers, and Isaac Taylor. The first prize, of £1,800, was adjudged to the Rev. Robert Anchor Thompson, master of the hospital of St. Mary the Virgin at Newenstle-upon-Tyne, and the second, of £600, to Dr. John Tulloch, principal of St. Mary's College, St. Andrew's.

Bunning, turn'ing (Sax. byrnan, to burn), the action of fire or heat upon any combustible matter, by means of which the constituent natticles of the sub-

means of which the constituent particles of the sub-stance acted upon are rapidly oxidized and converted

into vapour and ashes, or into calx.

BURENG-GLASS, a glass lens employed to refract the heat-rays of the sun into a focus. Dr. Young, in his lectures on Natural Philosophy, describes some remarkable experiments performed with Parker's burning also which the ing-glass, which was presented to the emperor of China when Lord Macartney visited Pekin. This instrument was a double convex lens, three feet in diameter, three rais a double cover less, three leef in diameter, three inches thick in the centre, and weighing 212 pounds. Its focal distance was 6 feet 8 inches; but this was generally shortened by a smaller lens. The most refractory substance fused was a cornelian, which required 75 seconds for its fusion; a crystal pebble was fused in 6 seconds, and a piece of white gate in 30 seconds. The solar rays may also be brought to a focus by reflection from a concave mirror, or from a combination of mirrors. With a machine composed combination of mirrors. With a machine composed of 109 small plane metallic mirrors, so arranged that they all reflected radiant heat to the same spot, Buffon found that he was able to set wood on fire at the dis-tance of 209 feet, to melt lead at 100 feet and silver at rance of 2025 reet, to melt lead at 100 feet and silver at 50 feet. A glass globe filled with water will collect the rays of the sun into a focus: hence there is some danger in leaving a fish-globe or a decanter of water near a window, exposed to direct sunlight, during hot weather. (See LENS, MILEGOR, REFERCTION, REFLEC-TION.)

BURNISHER DEAD. (See BURIAL.)
BURNISHER, ber'nisher (Fr. Sp. brunir, to burnish), a tool made of agate, steel, or some other very hard highly-polished material, and used by silversmiths, bookbinders, and others, to give smoothness and lustre to rough surfaces.

Busss and Scalds, burns, skawlds, in Surg., are in-turies done to the body through excessive heat; burns being produced by fire or heated solids, scalds by heated fluids. Scalds seldom penetrate deeper than the cutis; burns, on the contrary, may penetrate to any depth. Burns are more fatal in the young and old than in those of middle life, and are more dangerous on the head or trunk than on the extremities. A burn affecting an extensive surface is more to be dreaded anecting an extensive surface is more to be dreaded than one which penetrates deeper without extending over much surface. Where the skin is blistered, cold evaporating lotions should be applied; as, camphorated spirits of wine, sugar-of-lead lotion, or cold water, so as to prevent the blisters from bursting, and to lessen the agrammation. The blisters may be pricked with a tine needle, in order to allow the serum to escape; but

care is to be taken not to admit the sir, and on to secount is the raised cuticle to be removed. When the account is the raised cuticle to be removed. When the cuticle is destroyed, and the inflamed outle exposed, spirit of turpentine is the best application that can be used in the first instance. A mixture of line-water and milk, or of line-water and olive-oil, will also be found useful? In more serious cases of burning, arising from clothes taking fire, the explosion of guspowder, &o., the patient frequently, immediately after the accident, falls into a state of collapse, occasioned by the shock. He suffers no pain, and the pulse is quick, weak, and scarcely to be felt. Stimulants, as brandy, are to be freely administered, to prevent the patient from dying from the shock; and warm lime-water and oil or milk, or spirits of turpentine, are to be applied oil or milk, or spirits of turpentine, are to be applied to the parts: the collapse may last for several to the parts: the collapse may last for several hours, and, if not fatal, is succeeded by a stage of reaction: the patient becomes sensible, the pulse rises, pain begins to be felt, and, perhaps, vomiting takes piace. When the reaction has been established the stimulants should be laid saide; and now inflammation has to be guarded against. This stage is characterized by the usual local and constitutional symptoms attendant on inflammation. In the antiphlogistic treatment now adopted, much care has to be observed, as it is necessary to keep up the patient's strength. Poultices may be applied to the deeply-burnt parts, in order to expedite suppuration and the separation of the sloughs. When the sloughs have separation of the sloughs, when the sloughs have separated, and suppuration is established, icatrization commences. The poultices are now to be laid aside, and moderately stimulating continents to be applied. Great care is to be taken at this stage to preserve the parts in a proper position, as in cicatrization there is a great tendency to contraction, and naturally distant parts may be brought together, and much inconvenience or deformity may be the result. Extensive burns may prove fatal in any stage, and the patient, especially if young, or advanced in years, can seldom be pronounced free from danger until cicatrization has been completed. In the event of one's clothes taking fire, it is obvious that the upright posture is not only favourable to the spread of the flames, but allows them to reach the more important parts of the body, as the head and neck; while running about only tends to in-crease the power of the flames. The best thing, there-fore, to do, is to lie down and roll about on the floor, and, if possible, to seize the hearth-rug or table-cover, and envelop the body in it. The first thing for a person to do in being called to assist on such an occasion, is to snatch up a rug, blanket, or other woollen article, and envelop the body of the sufferer closely in it, which will have the effect of extinguishing the flames. In removing the clothes from the burnt parts great care is to be taken not to break any blisters that may be raised, as a great object is to exclude the air from raw or inflamed surfaces. A course frequently adopted in such cases is to cover the parts with flour, or to wrap them in wadding or cotton wool, so as to exclude the air; but the treatment indicated above is generally preferable.

BURNT-OFFERING. (See SACRIFICE.)

BURNT SIRNNA, burnt si-en'-nd, a transparent orange red pigment, used by oil and water-colour painters. It is made from burnt terra di Sienna, an ochreous ironearth. It mixes well with other pigments, and very fine greens are obtained by mixing it with Prussian blue. One of its chief advantages is that it dries quickly.

BURNT UMBER, um'-ber, a semi-transparent russet-brown pigment. It is made from umber, an nebreous earth containing manganese, found near Umbris, in Italy. It mixes well with other pigments and dries Italy.

quickly.

BURSE MUCOSE, bir'-se mu-co'-se (Lat., muons-bags), in Anat., are small membranous sacs, situated about the joints of the bones, and containing a kind of mucous fat, which serves to lubricate the joints, in order to render their motion easy. They are of different sizes and firmness. *Bursalogy* is the name given to a descrip-

tion of the burse mucosa.

BURSARII, bur-sai'-ri-i (Lat. bursa, a purse), the receivers or accountants at the bursaria, or exchequer,

of collegiate or other conventual bodies.

Bussawy, ber'-sa-re (F., bourse; Lat. barsa, a purse.)

## Bursch

is a sum of money allowed to a student at a university to enable him to prosecute his studies. The money is usually the annual proceeds of a bequest left by some private individual for that purpose. To is said that the private individual for that purpose. It is said that the institution of bursaries originated with the Poles in institution or oursaires originated with the Foles in the 14th century, who were acoustomed to supply promising young men with the means of travelling to Germany, and there studying philosophy under the monks. This practice was soon adopted in other countries; and now there is, perhaps, no civilized country in which such endowments do not exist, under the name of bursaries, exhibitions, fellowships, scho-larships, &c. They are of two kinds,—either for fur-nishing the student with the means of prosecuting his studies during the academical curriculum, or to devote himself to literary pursuits after that period. It is to the former of these that the term bursary is applied. In the Scottish and continental universities the former is the mode in use, though recently, in Scotland at least, the latter method has been introduced; at Oxford and Cambridge both methods prevail. (See EXHIBITIONS, SCHOLARMHITS, FELLOWSHIPS.) As already stated, bursaries, at least in Scotland, have in almost every case been founded by the munificence of private individuals. and generally with a view to securing the benefits of a liberal education to those who would not otherwise have the means of obtaining it. Some were to be adjudged by public competition, others were to remain in the presentation of the heirs of the donor; some were restricted to persons of certain names, others to persons born in certain parts of the country. The bursaries connected with the Aberdeen university are more numerous than those of any other of the Scottish universities. The number of bursaries connected with the two colleges Marischal and King's was 253, of the annual value of £3,150; but, by ordinances of the University Commissioners in 1862, the number has been reduced to 189, and their annual value to £2,770. The number of prizes or scholarships, which were formerly of the annual value of £235, has been raised to 16, of the value of £925. The tendency of late years has been more and more to alienate the bursary funds from their original destination and to bestow them as prizes for superior scholarship, or as inducements to persons after completing their scademical curriculum, to devote themselves to literary pursuits. This, we think, is to be regretted; for, while there may be some truth in the assertion that, where numerous, as in Aberdeen, they tend to induce persons to enter the learned professions who are not naturally fitted for them, yet when disposed of solely for scholarship on entering the university, as the great majority of them are, -and when the examination is mainly or solely confined to one branch, as Latin version-writing, then, we believe, that in many cases persons of talent and ability who have an many cases persons of talent and annuly who have struggled through great hardships to attain a certain amount of education, are denied the means of pro-ceeding farther, and that it was such cases that the founders intended to meet. Such persons, who may have had to thank a country parish school for all the instruction they have received, cannot compete on equal terms with those who have enjoyed the advantages of a long and thorough training under the best masters. The bussaries, too, being bestowed for scho-larship, have come to be viewed in the light of prizes, larship, have come to be traved in the light of prices, and we believe, in the majority of cases, are held by persons whose parents are well able to pay for their education. While so much is done for scholarship, we confess we should like to see something done for young men of promise, desirous of obtaining a liberal educamen or promise, desirous of dotaming a liberal educa-tion, without the means of doing so, and who, we cannot help thinking, have the first claim to be considered in the disposal of the bursary funds.

BURSCH, or BURSCHE, boorsh (Ger.), is the desig-nation applied to a student at a university in Ger-

BURSCHENSCHAFT, boor shen-shoft, was the name of an association of the students in Germany, formed in 1815, and which had for its object the political regeneration of Germany.

Bursers, bir-eard (so named in honour of Burser, the naturalist), in Bot., a gen. of plants belonging to the nat. ord. Amyridaces. The species B. gummiferu pomene in the Vil and acuminata yield fragrant resinous substances, that buskin, and it form the former being termed Chibou, or Cachibou costume of Diana.

#### Buskin

esin, and that from the latter, resin of Cares genus, with some other genera of Ameridaces, cluded by many botanists in a nat. ord. termed I

BURYING-BERTLE (Necrophorus), a gen. of Cal-tera, found in Europe and North America. The ptere, jound in nurope and Norm America. They have received their name from a remarkable habit they have of burying the bodies of dead birds more, moles, and other small animals, in which they deposit their eggs. One of the species is a native of Britain, the Necrophorus Vespillo. It is a black-beetle about an inch in Land. inch in length, and has two bright orange bands acro the back. It has an intensely fortid door, and the hands smell for hours after touching it. In some parts of Russia, where poor people are buried only a lew inches beneath the surface of the ground, the burying-beeties pierce the graves in every direction. In this country they feed upon putrefying dead bodies and the garbage that is thrown out near towns, as soon as it begins to smell. They hunt in couples, and as soon as they find a dead bird or mouse, they alight upon



BURYING-BEETLE.

it, and, after feeding, the male commences his work of interment. This is done by digging with his head alone a trench round the dead object; a second trench is then dug within the first, and then another, until the earth is cultiely excavated. The dead bird or mouse then fails into the hole thus formed. Much time and labour are expended in this work. As soon as the corps is fairly dragged to the bottom of its grave, the beetle quickly throws back the removed earth, and both insects bury themselves in the body. After the female has deposited her eggs, the pair work their way female has deposited her eggs, the pair work their way out. The eggs are quickly hatched. The larvæ are whitish, with six feet and a brownish head. When perfect insects, they make holes in the ground, and

work their passage to the outer air.

Buskin, bus-kin (Ang.-Sax.), the English translation of the Latin word cothurnus, which was a kind of boot, covering the foot, and rising above the calf of the leg.

sometimes even reaching as high as the knee. It was principally worn by hunters, horsemen, and persons of rank and authority. The sole of the bus-kin was generally of an ordinary thickness, but ordinary thickness, sometimes it was made thicker than usual by the insertion of slices of cork. The object here was to add to the stature of the wearer; for which reason it was worn by the Greek and Roman tragedians, in order to give them a more heroic



BUSKIN.

carance, as the soccus, or low-heeled shoe, was worn by the comedians. Hence, in English, the buskin and suck have come to be synonymous with tragedy and comedy; as in Dryden,-

Great Fletcher never treads in buskins here, Nor greater Jonson dare in socks appear.

It was also worn by ladies for ornament. The Melponene in the Villa Borglesse is represented with the buskin, and it forms part of the recognized hanting

## Bush

Bran, seek (Dan bosch), in Bot., a low diminutive shrub, with numerous branches near the base.

Bushki, bush'el (Fr boissesse), an English measure of capacity for dry goods, as fruits, grain, &c., and constaining fear peaks, or eight gallons, or one-eighth of a quarter. Until the year 1826, from the reign of Henry VIII., a Winchester bushel was the legal measure of England; but by the 6 Geo. IV. c. 74, it was superseded by the imperial bushel. The imperial bushel is the standard measure of capacity for coals, lime, fish, metatose, or fruit as well as all other goods. lime, the potatoes, or fruit, as well as all other goods commonly sold by heaped measure. It should contain 90 lbs. workdupois of distilled water, should be made round, with a plain and even bottom, and be 194 inches from outside to outside. Du Cange derives the name from basselus, a corrupt Latin word for a measure of wine equal to eight gallons.

Buss, Palm. (See Manicaria.) Buss, bust (Ital. busto), a term in Soulp., by which is Box, sust (1tal. busto), a term in Soulp., by which is meant a representation of the head, neck, shoulders, and breast, with, most frequently, the arms cut off midway above the elbow. The derivation of the word is uncertain, as the lat. bustom first meant the place where dead bodies were burnt, then the grave, and lastly, in later ages, was taken to signify the dead body, or rather a body without the



head. The representation of the upper part of the human form, as shown in the bust of sculpture, is supposed to have originated with a custom in vogue among the ancient Greeks of placing heads of Mercury on pillars, whence they were called Herme, from Hermes, the Greek name of that divinity. Busts were first used as portraits of men of renown, as warriors, statesmen, poets, philosophers, &c., about 330 B.C. The method of taking a cast in plaster of Paris from the human body is said to have been first

practised by Andrea Veroc-chi, an Italian, about the middle of the 15th century. By the sid of the plaster cast the sculptor is enabled to produce a very accurate portrait of the original, and in this branch of art English sculptors have attained a high degree of excellence. Among sculptors that are famous for their portrait busts, Sir Francis Chantrey stands pre-eminent.

Chantrey stands pre-eminent.

BUSTARD, bus-tard (Fr. bistards).—This is the largest of European land birds. When full grown, the Great Bustard (Oits tards) weighs from twenty-five to thirty pounds. It is about four feet long, and across its extended wings measures three yards. The head and notes are ash-coloured, and there is a tuft of feathers about five inches long on each side of the lower mandible. The bustards generally live in open countries dotted with low bushes, a locality which gives them the advantage of a broad look-out and secures them from surprises by enemies. They are said seldom to use their wings for acrial locomotion, but as adjuncts to their long legs in running. The speed they make this way is considerable, and may be sustained a very long time. The bird is still found in parts of France and Germany, and is common in Russia and on the extensive plains of Tartary. In this country, however, it has long been rare. Yet that they were sometimes common as cortain, so common as to be a looked-for dish at feasts and banquets. A living and reliable naturalist speaks of the circumstance being in his remembrance, of seeing one, and sometimes two, bustards gracing the Christmas board of the Bush inn at Bristol. In 1799 a bustard was taken alive on Salis-In 1799 a bustard was taken alive on Salisbury Plain, and, according to Stanley, the latest au-thentic instance of a capture of this bird is that of a gamekeeper in Norfolk, who took a hen bustard in a rabbit-trap, in May, 1829. One of the bustard's chief peculiarities is a singular pouch, shaped like a modern base of the lower mandible. The real use of this pouch sare of the lower mandible. The real use of this pouch parts of its plumings; pair base of the lower mandible. Douglass supposes that the bird fills it with water in the midst of the arid plains over country is only a rare winter visitant. When contrad

## Butcher-bird

which it is accustomed to wander; but as the possib peculiar to the males, this would seem, at least, in probable. Bewick has his opinion on the subject, as Stanley has his; but what can be said when Mr. Ya one of our best and most paintsking naturalists, hints broadly that it is altogether a blunder—that he has dissected a male bustard, and dissevered no posset all. With regard to the food of the bustard, as great diversity of opinion exists. Pennent declares



food to consist of corn and other vegetables that grow in their neighbourhood; Brookes asserts that their proper food is frogs, mice, small birds, and various kinds of insects; and Montagu, that vegetables (especially turnip-tops) and earth-worms form the staple of the bustard's aliment. The Little Bustard (Otis Tetrao), though common in France, Sardinia, and Italy, is very rarely seen here: it is also found in North Africa, Turkey, and Greece. It is about eighteen inches in length. It is a very shy bird, and when disturbed, escapes by alternately running and flying.

BUTCHER, but'-cher (Fr. boucher), a slaughterer of cattle for the table; also a vendor or retailer of the same. The methods of killing cattle vary in different countries, as do the means by which the mean is disposed of to the cousumer. In London, the carcass-butchers kill the saimals, and sell the meat in large quantities to the retail butchers, who afterwards sell it to their customers. Napoleon I., in 1809, judiciously removed the slaughter houses, which were receptacles of fifth and injurious to health, to the outskirts of Paris. In all countries the Jews have their own butchers, who are licensed by the rabbis, and who, instead of knocking down the unimals, according to the usual practice, cut their throats. The method of killing cattle by cut their throats. penetrating the spinal marrow is practised in some countries; and it has even been suggested, by some bumane persons, that the animals should be subjected to the influence of chloroform, that they might die without pain or struggle.

BUTCHER-BIRD (Lanius excurbitor).—The sunguin-ary title of this member of the Shrike family, received from Gener two hundred and fifty years ago, arises not only from its savage and cruel disposition, which seems to lead it to kull for the pleasure of killing, but also from its singular habit of impaling its victime on thorns and twigs, and in that position tearing and devouring their carcasses piecemeal. birds have the strongest autipathy to the batcher-bird, and will express their rage and fear by the londest cries should one appear in their neighbourhood. It is about the size of the common thrush. Its bill is black, and furnished with bristles at the base; the upper parts of its plumage, pule blue, and its under-parts white. It is common all the year in Erance, but in this

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#### Butcher's Broom

in a cage, the same love of fixing its food before it tears it to pieces is discovered, and for this purpose the bird usually avails itself of the wires of its prison, to which it hangs its dead captive. A bird of this species remained in the possession of a friend of Mr. Yarall for trajler months; it hearns are the contractions of the contraction of th sell for twelve months; it became very tame, and



BUTCHER-BIRD.

would readily take food from its master's hands. When a bird was given to it invariably broke the skull and ate the brains first. It sometimes held its prey in its claws and pulled it to pieces in the manner of the hawks, but seemed prefer forcing part of it through the wires of its cage and pulling at it. It always hung what it could not eat to the sides of its cage. It would often eat three small birds in a day. Another of these shrikes (Lanius collaris), a nativo of

exhibits this carcass-suspending propensity in as marked a manner as the above. The Hottentots assured Le Vaillant that this bird does not prefer fresh food, and that its motive for hanging its carcasses was much the same as prompts some of us to hang venison and game. A curious result sometimes follows this habit of the African shrike. Beneath the scorehing sun of that region the process of decom-position does not always take place, from the rapid exhalation of the animal moisture; consequently, the trees and shrubs are sometimes found bearing amongst their fragrant buds and blossoms many ready-dried specimens of the small birds of the country. .

BUTCHER'S BROOM. (See RUSCUS.)

Burna, bu-te'-a (named after John, earl of Bute, great patron of botanists), in Bot., a gen. of plants belonging to the nat. ord. Legaminose, sub-ord. Papi-lionacea. The most important species is B. froncosa, s native of India. This tree yields an astringent gum called butea gum, which resembles kino in its properties, and is sometimes forwarded to this country under that name. It is used medicinally in India in rhoma and similar diseases; also for tunning. It is used medicinally in India in diardried flowers of this species and those of B. superba are known as Tisso and Kessaree flowers, and are extensively used by the Indians in the production of beautiful yellow and orange dyes. The fibres of the inner bark of B. frondosa are known under the name of Pulas cordage.

BUTOMACKE, bu-to-mai'-se-e, in Bot., the Butomus or Flowering Rush fam., a nat. ord. of monocotyledonous plants in the sub-class Pelaloidea,—aquatic plants with parallel-veined leaves, sometimes milky. Flowers perfect and showy, with inferior perianth of six pieces arranged in two whorls, the inner being coloured; oraries superior, 3-6, or more; ovules numerous, arranged all over the inner surface of the ovaries; fruit many-seeded, separating more or less into as many paris as there are component carpels; seeds without albumen. The Butomocess chiefly inhabit the northern parts of the world, but a few occur in tropical countries. There are four genera and seven apecies.

BUTONES, bu-to'-mus (Gr. bous, an ox; temmo, I out), in Bot., the typical gen. of the nat. ord. Ituto-masses. B. unbellatus, the common flowering rush, is frequent in ditches and ponds in England and Ireland, but is very rare in Scotland. The leuves, which spring from the crown of the root, are from two to three feet long and of a triangular shape. The scape or flowering stem is longer than the leaves, and terminates in a large umbel of rose-coloured flowers. The plant possesses

## Butterfly

norid and bitter properties, and was in medicine. The rotated thisome sharp leaves of the Butones were be mouths of the cattle that cropped it— Burres, but ter (Bax, buter, buters

Burres, but ber (Bax buter, buters ? Ger. but Lat. butyram).—Buter is the fatty part of the mill milks separated by the process of chuming. On milk is composed of three ingredients,—the cha-portion or curd, the when on milk is composed of three ingredients, the che portion or eard, the whey or watery part, and butter. Milk when examined by the microscop found to consist of a number of fatty globules float in the whey. These globules, which are little a containing the butter, are broken during the proof churning, which allows the liberated fatty matter agreement in which have the state of the proof of the pr aggregate in small masses and float on the top of t wher. These are generally united by pressure against the bottom of the churn, and the remaining butters milk is given as a drink to pigs. The butter is afterwards spread out in a thin layer in a shallow pau, and washed with clear spring water to free it from buttermilk that may remain in its pores. It is then formed into rolls if intended to be sold as fresh, but if it is to be kept for any length of time, it is mixed with salt, in the proportion of three or four pounds of salt to half a hundredweight of butter, and packed in casks for the market. The quality and quantity of butter contained in cowe milk depend materially on the nature of the pasture. Rich natural meadows afford the best food for cows intended to produce butter. Poor pastures are objectionable, not only from the quantity of butter contained in the milk being diminished, but from its receiving an unpleasant tast from certain plants or weeds growing on all unfertile or marshy soil. The amount of butter produced by a gailon of milk should be from three to four ounces. Butter is much adulterated with water, dripping, and mutton fat. The first may be detected by the wetness of the butter when squeezed, and the two last by small white particles being visible in the newly-cut surface of the butter. The consumption of butter in London is or the butter. Lie consumption of butter in London as estimated at about 15,000 tons annually. About 400,000 ewt. of foreign butter are annually imported from Holland, Belgium, and France, and from 100,000 to 120,000 ewt. of Irish butter are annually sent to Possible 120,000 ewt. of Irish butter are annually sent to Possible 120,000 ewt. tugal and Brazil.

BUTTER OF ANTIMONY, terchloride of antimony. See Antimony.)

BUTTER OF SULPHUR, an obsolete name for precipitated sulphur.

BUTTER OF TAN, bickloride of tin. (See Tin, Culo-

BUTTER OF ZINC, chloride of sinc. (See ZINC,

CHLORIDE OF.)

BUTTER, VEGETABLE, a name commonly given to any concrete oil of vegetable origin which at all resembles the butter obtained from soimal milk, or which is employed for similar purposes. The most important solid oils or fats procured from plants are,—Butter of solid oils or fats procured from plants are,—Butter of cacao, from Theobroma Cacao; of cinnamon, from Cinnamonum zeylunicum; of nutmer, from Myristica moechata; of cocoa-nut, from Cocos marifera; of laurel, from Lauran nobilis; Shea or Calam butter, from species of Bassia; palm-oil, from Elais ghimnensis; and vegetable tailow, from Stitlingia schifera in China, from Vateria indica in India, and from Pentadessabutyracea in Sierra Leone. All these oils contains alarge proportion of stearine, and many are used as substitutes for animal fat in candlemaking. The plants yielding them are frequently termed butter-trees. trees.

BUTTERCUP. (See HANUNCULUS.)
BUTTERFLY, bull-ter-fly (so hamed from the colour of the yellow species; Sax. butterfleye), the name of an extensive group of the ord. Lepidoptera which fly by day. They are distinguished from other insects by these generic characters:—The antenne are terminated by a knob, or at least are somewhat suddenly thicker at my a mon, or at seast are somewhat suddenly thicker at the extremity; by the beauty as well of the under as of the upper side of their wings, which are usually erect when the animal is in a state of repose. They possess four wings, covered with minute scales, which to the naked eye appear like powder. "If you divide the wing of any butterfly, which you may easily do by soraping is on both sides with a penkfife, you will be smused to trace the lines in which the scales were planted, con-

## Buttermilk

sisting of iunumerable minute dots; the lines of the under side, in some cases, so out those of the upper side as by their intersection to form lozenges. With regard to the position of the scales on the wing, they rangally lie flat, but cometimes their extremity is in-curred."—(Airly and Spence.) The number of British Papilionida is not more than seventy, and at least two-thirds of this number are to be met within five-andtwenty miles of London; and it singularly happens, that some of these affect particular localities, sometimes of an area of but a few acres, and are never elsewhere seen. Even on such favourable spots their appearance is limited to a few days in a certain season of the year.

Another neculiar circumstance in the history of these insects is, that several species appear in certain localisation. ties, at intervals of several years, when they will literally swarm; come the next season, and not a solitary one will reward the most diligent searcher. This might be attributed to the variable character of our climate, but it is well known that in tropical countries the same irregularities occur. The external form of the chry-salids varies according to the species of butterfly that inhabits them; in all, however, there are spertures opposite to the thorax, by which respiration is carried on during the whole period of their inactive state. When the entembed creature has acquired sufficient vigour, and the down already grown upon it has separated it on all sides from the shell, the latter is broken through by the insect's head, and it emerges a butterfirst, however, the wings are closely folded to its body; but they soon expand of themselves, and are sufficiently hardened by the sir to endure the effort of flying. It, however, is not every chrysalis that be-comes a butterfly, probably not a thousandth part of their number do. Both in a caterpillar and in a perfect state they are surrounded by ever-hungering enemies. state they are surrounded by ever-hungering enemies.

Many species of the Ichneumonide perforate the hody of the caterpillar and there deposit their eggs; and although the caterpillar continues to live, and is transformed into a chrysalid, no butterfly is produced from it, those internal parts which were essential to its perfection being consumed. Sparrows and other birds are mortal foes to butterflies, and a single pair will active the force of the part will be the part of the pair will be the part of th easily dispose of between three and four hundred in the course of a single week

BUTTERMILE, but'-ter-milk, the milk which is left after the butter has been separated by means of churning, or other processes. It is ordinarily procured from milk after it has been kept some time, and has become more or less acid; but it may be procured from new milk when it is not acid, and only differs from milk by the absence of its oily parts. In this state it is still tolerably nourishing, and, being easy of digestion, is toperacy noursaing, and, being easy of digestion, is employed in phthicial cases with greater advantage than either the entire milk or the watery parts of it in a more acid state. The acid of buttermilk does not increase the acescency of the stomach, or occasion the flattlency usually generated by vegetable acids.

BUTTERWORT. (See PINGUICULA.)

BUTTERWORT. (See PINGUICULA.)
BUTTORS but'-tons (Fr. boutons), articles of dress
sed either for fastening or for ornamental purposes. Buttons are made of an endless variety of materials, the processes employed in the manufacture varying secording to the substance used. Metal, wire, wood, bone, glass, shell, mother-of-pearl, precious stones, selvet, silk, and other substances are used. Birmingham is the place where they are most extensively manufactured. They are made in a great variety of chapes; but, at the present time, these may be classed under four heads, —buttons with shanks; buttons without shanks; buttons on rings or wire moulds; and bustons covered with cloth or other material. Buttons with slignly are usually made of brass, which is supplied to the manufacturer in sheets of the required thickness. By means of fly-presses and punches, circular disks sailed blanks, are cut out of these sheets. This is mostly performed by females, who can furnish about thirty blanks per minute, or twelve gross in an hour. Hand-punching is the general mode of cutting out blanks; but more complicated machines, which out out

#### Buttress

them to receive a sharp blow from a polished steel hammer. In this state they are ready to receive the shanks, or small metal loops by which they are attached to the dress. The shank manufacture is a distinct branch of trade in Birmingham. They are made by a machine in which a coil of wire is gradually advanced towards. machine in which is only wire in greaturery are received a pair of shears which outs off short pieces. A metal finger then presses against the middle of each piece, first bending it and then pressing it into a vice, where it is compressed so as to form a loop; a hammer then strikes the two ends, spreading them into a flat surface, and the shank is pushed out of the machine ready for use. The shanks are attached to the blanks by women, with iron wire, solder, and resin. They are then put into an oven, and, when firmly united, form plain buttons. If a crest or inscription is wanted, the button is placed in a die and stamped. After being cleaned, they can be silvered or gilt. (See GILDING.)
The manufacture of gilt buttons has fallen off greatly overed with cloth. Horn buttons are that of wire sure, the horn being previously setted by heat. In 1851, there were 6.938 persons employed in the button manufacture in England; of these, 4,980 were employed in Birmingham.

BUTTERSS, but'-tress (Fr. buttee, from aboutir, to abut), a piece of masonry or brickwork projecting from the face of a wall, and giving it support and increased strength and solidity. In Grecian and Roman architecture the buttress was not used, but its place was occupied by a pilaster, or some slight projection in that form. The buttress washirro-

duced with Gothic architecture in the Mediæval period, and, by degrees, it was formed into a very ornamental addition to the building to which it was attached. Norman buttress was a flat projection, fluished with a slanting coping, jutting slightly over the face only, and not over the sides; there was generally a band round the lower part, which formed a con-tinuation of the capping of the basement, and if the basement projected beyond the face of the wall, the face and sides of the bottom of the buttress projected to a similar extent, forming a sort of rediment on which the upper portion rested; with this exception, its depth was the same throughout from top to bottom, but never very great; its face was generally broad. Some-times the Norman buttress is found in a semicircular form. Good ex-amples of this style, from its earliest adoption to the Transition period, may be found at Fountain Abbey, the ruins of the abbey at Glustonbury, and Norwich Castle. The chief characteristic of the Early English buttress is, that it projects from the face of the wall to a much greater extent than the Norman buttress, its depth being equal to, and sometimes more than, its breadth. It generally consists of two or three divisions or stages, each division being less in depth



than the one immediately below it, and finished with a water-table, or stone bevelled to present a single incined enrince, or a series of site-iaces, like shallow steps, one above another. The tops are generally finished in a triangular or pointed form, resembling the gable-end of a house, and the roof pre-jecting over it. Examples will be found at Canterbury Cathedral and the majority of Euglish parish churches. The buttresses of the Decorated English style are simi-lar, in ganges forms to these of the present a single inclined surface, or a series of surregister ten blanks at a time, are in use. After being punched, the edges of the blank are very sharp, and requires to be smoothed and rounded. Their surfaces are then planished on the face by placing them see then planished on the face by placing them see them planished on the face by placing them see them planished on the face by placing them see them planished with proceedings of the better than the butters of the becomes the butters of the better than the butters of the better than the butters of the butters of

# Butta, Rifle

phuscle. The edges of buttresses of the Early Beglish and Decorated Rogish styles are offen chamfered. When they are built at the corner of a building, they project diagonally sometimes, but generally two are built, at right angles to each other, on either side of the angle. Examples of Decorated English buttresses will be found at Exeter Cathedral, York-Minister, and Waltham Gross. The Perpendicular English buttress differs from the buttresses already mentioned in being divided into a great number of stages, with panels in front and at the sides, filled with rich tracery. They are higher, and have small pieces, in the form of a breakes or capital of a column, rising from the wall-plate at the top of each stage, which serve as pedestals for small statues. King's Collego, Cambridge, and St. George's, Windsor, furnish good examples of this kind of buttress. Flying buttresses pre buttresses built against the walls of the side-sisles of cathedrals and large churches, and connected with others immediately in their rear, projecting from the walls of the nave, with stonework in the form of a semi-arch, which is sometimes plant. And sometimes chaborately carved and perforated with trace-y of rich design, as may be seen in those at King Henry the Seventh's Chapel, Westminster Abbey, the cathedrals at Salisbury and Chichester, and those at Amiens and Rheims, in France, which present extraordinary examples of stonework carved with skill and taste. Flying buttresses were carved with skill and taste. Flying buttresses were

Burrs, Rible, buts (Fr. but, a mark), a term applied to a screen, generally made of earth-work and masonry, for protecting the markers during rifle-practice at a target. It is placed about fifteen yards in front of and to one side of the target, and in such a position that the markers can easily see the face of the target from it. When the nature of the ground will permit, a trench is dug, and the earth excavated is thrown up on the side of the firing. The interior is lined with stonework, and there are two wings, or epaulements, which protect the markers not only from the shots but from any stones that may be thrown up them. About eighty yards in rear of the marker's butt, a smaller butt, capable of holding two men, is placed, wherever it is practicable. The markers in these butts note the ricochet shots. The bank, screen, or earth-work against which the target leans is also called a butt.

Butti, bu'-tile (C, H<sub>u</sub>).—Butyl is an organic radicle, discovered by Kolbe amongst the products obtained by electrolysis from valerate of potash. It may also be prepared by the action of sodium on iodine of butyl, in a vessel so arranged that the volatilized products may return into it as fast as they are volatilized and condensed. When the reaction has terminated, the butyl may be distilled off at a temperature not exceeding 300° Fahr. When pure, it is a limpid oil, with an agreeable ethereal odour. It boils at 220° Fahr, and may be distilled without alteration. It is one of the lightest known fluids, its spec. grav. being only 0.694. It is the radicle of a great number of very interesting organic compounds. It has been called valyl by certain chemists, from being formed from valeric acid, and by others tetryl, from being fourth in the series of hydrocarbon radicles:—

Methyl, C<sub>2</sub>H<sub>2</sub>.
 Ethyl, C<sub>4</sub>H<sub>5</sub>.
 Tetryl, C<sub>4</sub>H<sub>9</sub>.

BUTTLE ETHER, or Oxide of Butyl, bu-til'-ik (C, H, O), was first described by Kolbe as a product of the voltaic decomposition of valorate of potash. It is at present but little known. Butylic alcohol, or hydrated oxide of butyl (C, H, O, HO), was discovered by Wurtz in bestroot moisses. It is a colourless highly refractive liquid, boiling at 225°, and has a slightly vinous adour, somewhat resembling that of amylic alcohol. Its spec, grav. is 0.803. It is quite similar in properties to the other alcohols of the same group.

BUTTLINE, bu'-4t-line (O, H, s), butyl less one equiva-

BUTTLINE, but-ine (U.H.), buty less one equivalent of hydrogen. This compound was discovered by Faraday amongst the products of distillation of oil, und is frequently called oil-gas. It is a colourless gas, burning with a white inminous flume. It is one of the principal products of the distillation of india-rubber, is was afterwards obtained by Kolbe from valerate of potent, and by Wurts by acting on butylic alcohol.

#### Burns

with obloride of zinc. It is similar in its properties to ethyline  $(C_*H_*)$ , or olellant gas, the corresponding product of ethyl.

Buyrant of Livin, but e-rait, the source of tractyric acid, is made in the following manner:—Buyrant chalk, and cheese, are mixed with sufficient water to form a solution of spec, grav. 1-070, and exposed to temperature of 80° or 90° for some weeks. Buyring fermentation ensues, the liquid becoming ropy, and giving rise to lactic acid, which unites with the time and forms lactate of lime. The lactate of limes in turn becomes decomposed, giving rise to butyrise of lime is abundance. The compounds and derigatives of lime is abundance. The compounds and derigatives of lime is abundance. The compounds and derigatives of lime is abundance. The same relation to butyr that actic acid does to ethyl, and is, in fact, the hydrasted oxide of butyryl, as acetic acid is of acetyl. Butyric ether, a combination of ethyl and butyric scid, is a colourless inflammable liquid, with a peculiar door and taste of pincapples. Dissolved in alcohol, it is used in confectionery under the name of pincapples oil. The peculiar odour of old rum is due to the presence of a small quantity of this ether. It must not be confounded with huttlie ether. (See Buyrus).

confounded with butylic ether. (See BUTYL.)
BUTYLIC ACID, bu-tir-ik (from Lat. butyrsa; butter), (HOG,H,C).—Butyric acid is a liquid with a
sharp, acrid taste and a smell of rancid butter, having a
spec, grav. of 0.973, and boiling at 314° Fabr. It is prepared by distilling three parts of butyrate of lime
with twelve parts of water and one of hydrochloric
acid. Butyric acid exists ready-formed in certain
fruits, and is one of the products of oridization of
fibrin, or caseine. All substances which form lactioacid may be made to yield butyric. Its salts, when
dry, are incolorous, but when wetted, a strong smell,
resembling that of rancid butter, is perceptible.

BUTYLINE, but'e-rine, an oleaginous substance, discovered by Chevreul in butter. It is prepared by exposing purified butter to a temperature of 66° for several days. Stearine separates in grains, and one oily compound is obtained, which is mixed with alcohol and frequently shaken during twenty-four hours. The alcohol is then distilled off, carbonate of magnesia added to the oily residue, which is washed and treated with alcohol, which, on being once more distilled, leaves the butyrine behind.

BUTTRONE, but'-e-rone, a substance obtained by Chevreul amongst the products of distillation of butyrate of lime. It is similar in properties to acctone and propione.

BUXINE, buk'-sine, an alkaloid obtained from boxwood. It has a bitter taste, and is insoluble in water. It is soluble in a slight degree in alcohol and ether. It forms neutral salt with the noids, and note as an alkali on reddened litmus. Boxwood bark contains nearly one per cent. of buxine.

nearly one per cent. of buxine.

Buxom, buk-sum (Ang.-Sax. bucsum, easily bended to the will of another), originally signified obedient or obsequious; and in an old form of marriage, the bride promised to be obedient and buxom to her husband. At present it is used in the sense of gay, lively, brisk, associated with plumpness.

Buxus, buk-sus (supposed to be from Gr. puknos, dense, in reference to the wood), in Bot., the Box, a gen. of plants belonging to the nat, ord. Emphorbiscos, and consisting of evergreen shrubs or small trees with opposite leaves, entire at the margins, and easily split into two plates. The flowers, which are very small, grow in little axillary clusters, the male and female flowers being distinct, but borne on the same plant. There are only two species known; namely. B. semper-seriens and B. bulcarica. The former, which is the common box, is remarkable, botanically, for being the most northern arborescert species of Euphorbiscoca. In Britain, it seldom attains a height of more than twelve or fourteen feet; but, in the south of Europe, it is often twice that height. It grows wild in this country only on the dry chalky hills of the south. Many varieties are known in gardens, the most remarkable of which is the dwarf-box, so much used for the edgings of walks. The wood of the arborescent B. semperviens is heavier than that of any other European tree, and will sink when placed in water. It is of a beautiful pale-yellow colour, and of a fine regular and compact texture. It is preferred to every othes

## Busserd

kind of wood for the manufacture of flutes, flageolets and other wind instruments; of rules and mathematical instruments; and of the handles to most small tools. instruments; and of the handles to most small tools. Root the purposes of the turner, the wood-carryer, and especially of the wood-engraver, boxwood is invaluable. Most of the wood-engraver, boxwood is invaluable. Most of the engraving; printed in the illnerated papers are executed on blocks of this wood. Spain and Portugal export large quantities of boxwood; so also do Circassia and Georgia, through the port of Odessa. In 1815, the box-trees cut down on Box hill, meas Dorking, in Surrey, produced upwards of £10,000; but the tree is of such slow growth, that it is seldom cultivated in Britain, except for ornamental purposes. The lesses of the common box are purgative, and have been employed medicinally. An empyreumatic oil obtained from boxwood has been used successfully for the resief of toothache. B. balearica, the Turkey, Minorca, relief of toothache. B. balearica, the Turkey, Minorca, or Balearic box, forms a larger tree than the other spe s, and has leaves three times as large. It is much more impatient of cold, but is occasionally seen in shrub-beries in the south of England. The wood is of a bright reliow, and much inferior to the true boxwood, for country in large quantities from Constantinople, and

sold for wood-engraving.

Buzzard, buz'-zard (Du. buzaard; Buteo vulgaris), a predacious and carrion-feeding bird, common to the whole of Europe. It is a sluggish bird, and its courage is not nearly commensurate with its size; for, while it measures nearly two feet in length, and its extended wings cover a breadth of nearly five feet, it will flee from the attack of a magpie or jackdaw. Like the file, the raven, and all birds that feed much on car-rion, the buzzard has a lofty flight when in search of food. In colour it is reddish-brown above, and white or cream-colour beneath; the tail is barred with black and ash-colour, and has a white tip. The bird's beak is comparatively small and feeble. It breeds in extensive woods, builds a ragged nest, and lays two or three save woods, builds a ragged nest, and lays two or three eggs, which are either wholly white or white blurred with yellow. If during the period of incubation the hen should be killed, the male bird will take upon himself the business of hatching and rearing the brood. The young accompany the old birds for some time after quitting the nest; a circumstance unusual with most birds of prey, who drive off their young almost as soon as they can fig. "In the softness and fulness of the runners are furthered large and habits." as soon as they can fly. "In the softness and fulness of its plumage, its feathered legs, and habits," writes Dr. Richardson, "this bird bears some resemblance to the owis. It flies slowly, sits for a long time on the hough of a tree, watching for mice, frogs, &c." Wilson likewise observes, that in Penusylvanis it is in the habit of coursing over the meadows long after the sun has set. The honey-buzzard, or pern (Pernis opicorus, Cavier), is a little longer than the common buzzard, and not so builty. The crown of the head is of a ways and not so bulky. The crown of the head is of a pure bluish ash-colour; the upper surface deep brown, barred with deep brown. It is said to derive its name from the partiality it shows for bees, wasps, and their larve as food. "One of these birds was shot in Pendriag-Hall Park, Suffolk. The person who killed it, saw it on the ground near some wasps' nests. I found, on secting it, a quantity of wasps and nymphæ from the comb, both in its craw and stomach, with a few small beetles. It would be highly interesting could we be made aware of the manner in which this bird conducts the attacks on the wayse nest. The buzzard in order to get at the comb, must, in some way, enlarge the intrance; the legs and claws of the bird I have mentioned were very dirty, even to the knee, most likely brom searching much on the ground for food, and using them in making an entrance into the wasps' nests."

Linguishes of Natural History.) The hony-buzzard massite Bussia, Sweeden, and Norway, and is found generally in the south of Europe. It is rare in this suniter, though the has been known to theed here. Sie generally in the south of Europe. It is rare in this sountry, though it has been known to breed here. Sir William Jardine quotes a case, as does W. R. Fisher. (See the Zoologiet.) White, in his "Natural History of Selborne," tells of "a pair of honey buzzards that built them a large shallow next, composed of twigs and lined with dead beechen leaves, upon a small, slender besch, near to Selborne Ringer. In the middle of the month of June, a bold boy climbed this tree, though training on so deep and dizzy a situation, and brought

# Byzantine Architecture

down an egg, the only one in the next. The egg we amalier and not so round as the egg of the commo buzzard, and was dotted at each and with small re-spots, and surrounded in the middle with a broad an blood-red gore."

BY-LAW, bi-law, is a private law made by those win are duly authorized to do so by charter, act of partie ment, prescription, or custom, for the preservation a ment, prescription, or custom, for the preservations order and good government within some particular place or jurisdiction. If made under an act of partial ment, they must be sanctioned and approved by the secretary of state, or some public board to whom the act gives authority for the purpose, and they are the as binding as enacted laws. They must not be against the public policy of the law, and must be reasonable and other public policy of the law, and must be reasonable. Joint-stock companies and other such bodies are em powered by their charters or deeds of settlement to

make by-laws, which are binding on the shareholders.

BYERHUS, bir-rus, a gen. of the ord. Colonters. This insect is about the size of the lady-bird, is of a deep brown colour, with its wing-shells marked by blace

lines. It is commonly found in gardens.

BYRSONIMA, bir-so-ni'-ma, in Bot., a gen. of plants belonging to the nat. ord. Malpighiaccas, consisting of tropical trees, all remarkable for their astringency. Thus the bark of B. crassifolia is used internally as as antidote to the bite of the rattlesnake, and for other purposes where an astringent medicine is desirable The barks of other species are much employed in Brazil for tanning. American alcornoque bark, which is now largely imported into this country for the use of the tanner, is said to be the produce of B. laurifelia rhopalafolia, and coccolobafolia. Several species have racquarguin, and coccoionaristic. Several species navi-edible fruits. The fruit of B. spicate is used medici-nally in the treatment of dysentery. Byssolity, bis-so-lite (Gr. busses, fine flax, klades, a branch), a name applied to fibrous varieties of amian-

thus, tremolite, actinolite, and other minerals of a fliamentous nature.

absent, or having as many petals as there are lobes to the calvx; stamens hypogynous, equal in number to the petals, and opposite to them, or twice as numerous. or indefinite (when more numerous than the petals some are always sterile); filaments more or less united anthers 2-celled, introrse (turned inwards); over sessile or stalked, composed of 4—10 carpels, united seasue or stated, composed of \$\frac{1}{2}\$ to carpets, united round a centreal column; style simple; stigmas equal in number to the carpels; ovules 2 in each cell fruit usually capsular; embryo straight or somewhat curved, usually lying in a small quantity of fleshy ablumen, the cotyledons being plaited or spiral. There are 45 genera and 400 species, mostly tropical plants. In their properties they closely resemble the Maloncea and Sterculiacea; thus, many are mucilaginous, as the Watheria douvadinho, the species of Pteropernume, and the bark of Guazuma ulmifolia, Abroma angustum, and Dombeya specialitis. The fruit of Guazuma ulmifolia contains a sweetish pulp, which is eaten in Brazil.

The most important plant of the order is Theobroma Cucao, the cacao or cocoa-tree, from the seeds of which cocoa and chocolate are prepared. (See TREOSHOMA.)
The typical gen. Byttneria does not include any plant remarkable for useful products.

BYANTINE ARCHITECTURE, be-zan'-time.—After the division of the empire of Bome into the Eastern and Western empires, the latter of which retained Kome as its capital, while Constantinople, then known as Byzantium, became the seat of government of the former, new styles of architecture were gradually produced in each metropolic to sait the requirements and progress of the age, which aprung out of the forms that had been adopted for the temples of heather Rome and the Christian churches of the later period of the empire. From the classic architecture, therefore, of old Rome was derived the Romanesque, which gradually apread through Western Europe, and is one sidered by some to have passed through various phases, known as Lombardic, Norman, Saxon, &c., until it

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attained the full extent of its development in the Gothic exchitecture of different periods in the Medicaval ages; and the Byzantine, the parent stock of Arabian architecture, from which all public buildings of ancient date in northern Africa and Spain derive their principal characteristic features, the pointed arch excepted, which influenced the architecture of the East, excepted, which indusined the architecture of the East, and even spread westwards, as may be seen in many a noble structure in Venice, Italy, and southern France. In our own times, Bysantine architecture is the ecclesistical style of architecture in Russis, the prevailing style of the Grack church, as Gothic architecture is seculiar to the cathedrals and churches of Roman Catholic and Protestant countries in Western and Catholic and Protestant countries in Western and central Europe. Byzantine architecture may be con-sidered to have been originated by Constantine the Great, who commenced rebuilding Byzantium in the year 324, and gave the city the hame which it now years, removing the scat of government thither from bears, removing the scat of government thither from Rome about four years later. Constantine spared no expense to make his new city the most magnificent in the world; public works of all kinds were erected with marvellous rapidity, from the designs of architects who had followed the emperor from Rome, and adorned with sculpture gathered from the fallen cities of Greece and Asia Minor. At first, the palaces, temples, churches, baths, and basilicas, which were crected, were based on the plans, and embraced all the characteristic features of similar buildings at Rome: but, to carry out his grand designs, Constantine caused schools to be established for the study of architecture, in which men were trained for the profession, who gradually mingled new and original features with those of the mingled new and original features with those of the style that had been introduced from the West, and formed a style of architecture peculiar in itself, and eminently adapted to the requirements of the ritual of the Greek church, although bearing evident traces of the source from which it originally sprung. There are four periods of Byzantine architecture, including are non periods of Byzantine architecture, including that of its decline, from the conquest of Constantinople by the Venetians in 1204, to the overthrow of the Eastern empire by the Turks in 1453. The first, or transition period, in which it gradually lost its similarity to the architecture of Rome, then known as Romanesque, ranges from 325 to 525. The churches were then built in the form of the Roman basilication. (see Basilica), with a central nave and long sideaisles, a portico at the western end, and an apse at the east end. The second period, when it had at the east end. The second period, when it had assumed an entirely distinctive character, extends from 525, shortly after which Justinian assumed the purple, to the close of the 8th century; and the third from this epoch to 1204, when Baldwin, count of Flauders, and his Venetian allies, attacked the Greeks, and gained temporary possession of Constantinople. The prevalent form of the churches of the second period, or period of pure Byzantine architecture, is that of the Greek cross; the central square, formed by the intersection of the arms of the cross, is covered by a dome or cupola, and the spaces which represent the arms are also covered by semi-cupolas, or, in many cases, entire ones. The whole length of the interior, from east to west, is divided into five parts. At the east end is the apse, in which stood the altar, divided east end is the apse, in which stood the alter, divided from the next portion, called the bems, by a panelled acreen richly adorned with paintings and gilded carred work, in which were three doors of communication be-tween the bems and the apse, which was considered to be the holiest part of the church. The bems or sametiary, which lay immediately before the apse, sometimes contained the bishop's throne. The choir came next, extending from the bema to the nave, and was allotted to the priests and those who took part in the chord services of the church. The pare formed the body of the church, separated from the choir by a halustrade, and from the narthex, or large western ves-tibule. by a screen. The narthex was provided with tibule, by a screen. The narthex was provided with galleries in which the female catechumens sat, the gameries in which the related exceptances sut, the males coupying the ground-floor of that portion of the building. The Roman, or semicircular arch, is the only form of arch employed, and the great distinctive fea-ture of the style is the constant use of the cupols or

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pierced with lights, which gave a light and alegant as pearance to that part of the structure. The heads at the windows were sensitivous in form. The door sometimes had semicircular headings, but they were generally surraounted by the flat lintel; the pillars use and analysis are constant of the pillars use that the pillars use the generally surmounted by the first intest; the pulsar users generally square or otagonal in form, surmound by square capitals taporing downwards, with the iners of the lower part of the capital taken of whe surmounted an octagonal shaft, to give it a corresponding form below, although the upper part remains aquare. The capitals were adorned with foliage, go rally of a symmetrical pattern, in relief, on sanks, panels formed in the faces. The interior was right ornamented with soulpture, painting, and means work of most elaborate description. The cathedral of St. Sophia, now the principal mosque at Constantinople, built by Justinian in 532, is considered to be one of the inest existing specimens of Byzantine architecture; good examples of the style of the second period are also to be seen in the churches of St. Sergius and St. Irene, at Constantinople. The best examples of the third period are the churches of St. Mark at Venice, and St. period are the courons of st. mark at venues, and ex-Pantocrator at Constantinople: in this period greater attention was paid to external decoration, but the churches were much smaller in every respect. The church of St. Anthony at Padua, the extendral at Akt-la-Chapelle, the churches of Revenue and Prise, and that la-Chapelle, the churches of Havenna and Fras, and that of St. Frant at Périgeaux, in France, are also Byzantine in character. Noble and massive in form, and decorated with broad masses of rich and warm colour, wast and majestic in its proportions, with all the details boldly, yet carefully and laboriously worked out. Byzantine architecture, in its purest character, as exemplified in the church of St. Sophia, the great type of the style, is well worthy of adoption in modern English church architecture: for while it will bear comparison church architecture; for, while it will bear comparison with Gothic architecture in every respect, and is superior to it in many, it is infinitely better than that of the classic form gathered from the heathen same of Greece and Rome, as may be seen by contrasting the magnificent Byzantine church built at Wilton, in Wiltshire, by the late Lord Herbert of Lea, better known as Mr. Sidney Herbert, with the heavy unpreposessing piles, in imitation of the classic style, that were produced by the architects of the 17th and 18th centuries. The following account of the church of St. Sophis, rebuilt by Justinian after it had twice suffered destruction by thre, is derived from the historian Gibbon. The architects were Anthemius of Tralles, and Isidorus of Miletus, the former of whom superintended the works in person, often accompanied by the emperor himself. It was finished in nearly six years from its commencement, and dedicated to the service of God by a sol festival. The eastern part of the dome was injured by an earthquake, and the dome was, therefore, rebuilt by the uppnew of Anthemius, under the direction of Ju-tinian. The dome is 115 feet in diameter, and lighted tinian. The dome is 115 feet in diameter, and lighted by 40 windows round the base; the first dome was very flat, being barely 20 feet in height, or 180 feet above that, being barely 20 feet in neight, or 180 feet above the pavement; the second dome, which still exists, is 40 feet high. The circle on which the dome rises is supported by four bold arches, which spring from massive piers of freestone, clamped together with iron and cemented with lead and quicklime, placed at the four angles of the central space; the dome is built of pumice stone and very light porous bricks from the isle of Rhodes. The form of the building is that of a Greek cross, measuring 269 feet from east to west, from the sanctuary to the nine western doors between the narthex and the nave, and 243 feet from north to south. The doors of the edifice are the only parts in it made of wood; the building itself is built of brick covered with elabs of marble. It is richly adorned with 100 columns of marble of different colours, issper, and porphyry; eight of which came from the Temple of the Sun, and eight, of green marble, were given by the magistrates of Ephesus. The walls, the great central dome, the or expresses. The waits, the great central dome, the semi-domes, and pavement, are adorned with mosaics; and there were many images of our Saviour, the Virgin Mary, and the saints, which the Turks have mutilated and defaced. Every part of the building was adorned with gold and silver; the balustrade of the choir, the capitals of the perarre, the ornaments of the doors and sallaries were of hunter withly silt; the dome, which was supported on erches of a wide span, choir, the capitals of the perare, the ornaments of the springing from massive piers at the four corners of the doors and galleries, were of bronze, richly gilt: the central space. The base of the dome was sometimes sanctuary is said to have contained more than 17 toss

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of silves, many portions of it being overlaid with solid plates of that metal; and the holy uses and vestments of the altar were of pure gold, enriched with jewels of great value. It is computed that the lowest sum which can be named as the cost of the building is one million pounds sterling.—Ref. Neale's History of the Roly Eastern Church; Ferguson's Hund-book of Architecture; English Cyclopadia—Arts and Sciences.

Brianking Churche opportune Arts and sciences.

Brianking Church comprehends collectively all those churches which acknowledge the supremacy of the commencal patriarch of Constantinople. The adherents of this church are comprised ulmost entirely within the limits of Turkey, Greece, and Palestine, and are altogether estimated to amount to about 3,000,000.

BYZANTINE, GREEK, OF EASTERN EMPIRE, are designations given to the Eastern Roman empire, sounded on the death of Theodosius the Great, a.D. 395. This monarch divided the Roman empire between his two sons, Arcadius and Honorius, giving to the former the eastern portion, comprising, in Asia, Svria, Asia Minor, and Pontus, to the shores of the Black Sea; in Africa, Egypt; in Europe, Thrace, Mœsia, Macedonia, Greece, and Crete. Through the weakness of Arcadius, this empire suffered many misfortunes. At first the government was in the hands of Rufinus, who was succeeded by the eunuch Eutropius, and the latter by Gainas, the murderer of Rufinas. This last fell in consequence of his ambitious designs in 401, and the proud and covetous empress Eudoxia now ruled till her death in 404. Her husband survived for four years more, and, on his death in 408, was succeeded by his son, Theodosius II.; but being a minor, and naturally of a weak and feeble mind, the government was conducted first by Anthemius and afterwards by his sister Pulcheria, who took the title of Augusta and governed with great ability. She enlarged the empire by wreating West Illyria from the Western empire, and Armenia from Persia. On the death of her brother, in 450, she succeeded to the empire, and married the senator Marcianus, whose valour averted the attacks of Attila on the frontiers. Lee I, a Thracian of low birth, was elevated to the throne on the death of Marcianus, in 457. He ruled well; but an expedition of his, undertaken against the Vandals in 467, failed. He was succeeded by his grandson, Leo II., in 474; but he only surgived a few months, and was followed by his father, Zeno. The rule of this monarch was by his father, Zeno. The rule of this monarch was weak, and he was disliked by his subjects. During his reign the empire was harassed not only by foreign foes was disturbed by internal rebellious. After his death, in 491, his widow Ariadne, by marrying the minister Anastasius, raised him to the throne. His reign was characterized by numerous wars. He carried on a six years' contest against the robber tribes of Mount Taurus; he was engaged in war with the Bulgarians on the Danube, to defend himself from whose neursions he built the long wall, as it is called, across incursions he built the long wall, as it is called, across the peninsuis of Coustantinople. The war with Parsis also broke out afresh during his reign. On his death, in 518, the soldiery proclaimed Justin emperor. This monarch maintained his position mainly through the influence of the clergy, whom he conciliated by persecuting the heretics. He was succeeded in 527 by his nephew Justinian, famous for his code of laws. His nephew Justinian, famous for his code of his san talk reign was distinguished by the victories of his generals Belisarius and Narses; but its rapid decay after his death showed how little had, during his reign, been contributed to the material strength of the empire. He was succeeded (665) by Justin II., a weak and cruel prince, under the government of his wife Sophia. The Lombards wrested from him a part of Italy; he carried on an unsuccessful war against the Persians; and the Averi plundered the provinces on the Danube. Vexation at these misfortunes drove him insane. Tiberius, cup-tain of the guard, was then made regent, and on the care of the guard, was then made regent, and on the death of Justin, in 578, he was raised to the throne. He reigned with mildness and wisdom, purchased peace with the Aver, and conquered the Persians through his general Mauricius, whom he left as his manessor in 582. The latter replaced Kosroes II. on the throne of Persia, and thus obtained peace with that country; but, on the exher hand, his wars with that country; but, on the exher hand, his wars with that Avani did not prosper. He was slain in a military taxari did not prosper. He was slain in a military taxari excessor, Phocas, proved a 288

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wicked and abandoned ruler, and was clain in a cen-spiracy, 610. He was stocceded by Heracius, who was successful against the Avari and Persian, but found a more formidable foe in the Avabs, who during 695-41 overran the countries on the Enuhantes, Byris, and Egypt. Heraclius was succeeded by his son, Constantine III.; but he died soon after, and was suc-Constantine III.; but he died soon after, and was succeeded by his step-brother Heracilonas, who specific both is crown in an insurrection. Constant III. ascended the throne 612; he concluded a peace with the Arabs, but afterwards, in 608, lost his life in accomplinary. He was succeeded by his son, Constantine IV., Pogonatus, who compelled a peace from the Arabs by the Greek fire, but was, on the other hand, obliged to give tribute to the Bulgarians. He was succeeded in 695 by his son, Justinian II., who was deposed in 695 by Leontins, and he in turn by Apsimar, or Tiberius III., and this last by the Bulgarian king Trebelius, on which Justinian, in 765, again ascended the throne. He was assassinated in 711, and with him terminated the dynasassinated in 711, and with him terminated the dynasassinated in 711, and with him terminated the dynasty of Heracius. In 713, Philippicus, the successor of the last king, was deposed, and in 716 Anastasius, who succeeded him, retired to a monastery. His successor, Theodosius III., abdicated the following year, and Leo III. ascended the throne. In his contests with the Arabs he gave occasion for the breaking out of those conrent the empire for more than a century. In 728 the exarchate of Ravenna was lost, and the eastern provinces became the prey of the Arabs. His son, Constanting V., who succeeded him in 741, was a harge and arable property. was a brave and noble prince, but, on account of his zeal as an iconoclast, was hated by the monks, who gave him the surname of Copronymos. Lee IV. reigned from 775 to 780, and was succeeded by Constantine VI., who, having attempted to free himself from the influence of his mother, Irene, and her para-mour Stauratins, that ambitious woman caused him to be blinded, and he died soon after (797). A powerful party having risen against her, she was obliged to take refuge in a convent, and Nicephorus was raised to the throne (802). He fell in a war against the Bulgarians (811), and his son Stauratius soon lost the throne to (811), and his son Stauratus soon lost the turone to his brother-in-law, Michael I., who, in his turn, had to yield it up to his general, Leo V. (813). This last was a skilful and victorious ruler; but he fell in a conspiracy excited by his zeal against image-worship (820). Under Michael II, Crete and Sicily fell into the hands of the Arabs. His successor, Theophilus the hands of the Arabs. His successor, Theophilus (829-42), is praised for his love of justice. Under Michael III. (842-67), in 842, by the council of Nicas. the worship of images was again established. Basilius I., the Macedonian, who caused Michael III. to be put to desth, governed (867-86) with wisdom and power, and was rictorious over the Paulicians (whom power, and was rictorious over the Paulicians (whom see) and the Arabs. His dynasty continued in possession of the Byzantine throne, with few interruptions, till 1056. His son, Leo VI., surnamed the Philosopher, reigned from 886 to 912, and was succeeded by Constantine VII., Porphyrogenitus (912-58). The dissolute Romanus II. reigned from 959 to 963, and was succeeded by Nicephorus Phocas (963-69), and the latter by Tzimiskes, who ruled till 976. He was victorious against the Arabs and Bulgarians, as well as acquiret the Russians was for the first time. well as against the Russians, who, for the first time, during the reign of Michael III., appear in a hostile attitude towards the Byzantine empire. Basilius II. (976-1025), the son of Romanue, a brave prince, con-(976—1020), the son of Romanie, a prave prince, some queried the Bulgarians, and made their country a pro-vince of the empire. His successors, his brothers Con-stantine VIII. (1025-28) and Romanus III. (1028-34), who obtained the throne by marrying Zoe, the daughter of Constantine, were very unlike him. The latter was assassinated by his wife Zoe, an abandoned but crafty princess, who raised successively Michael IV. (1034), Michael V. (1041), and Constantine IX. (1043) to the throne. On the death of Constantine (1054), Theodorn, sister of Zoe, was raised to the throne, and Theodora, sister of Zoe, was raised to the surgue, sum on her death, in 1050, was succeeded by Michael VI., who, the following year, was deposed by Isaac I., with whom begins the Commenian dynasty. He retired to a monastery in 1059, and was succeeded by Constantine X., who reigned thi 1067; and his widow Endozia, by marrying Romanus IV., raf "I him to the throne.

Romanna was deposed by Michael VII., whose successors were Nicephorus III. (1078) and Alexius Comnenus (1061). Under the latter of these began the Crusades. His successors were Johannes, or Kalo-Johannes (1118), and Manuel I. (1143), both able Orusades. His successors were Johannes, or KaloJohannes (1118), and Manuel I. (1142), both able
princes, who warred successfully against the Turks.
Manuel's son, Alexius II. (1189), was mufdered by his
guardian Andronicus (1189), who son afterwards fell
man insurrection, and with him terminated the Comnenian dynasty. His successor, Isaac II. (1185), was
deposed by his brother, Alexius III. (1195); but the
Crusaders afterwards restored Isaac to the throne,
together with his son, Alexius IV. The cltisens, however, raised to the supreme power Nicolas Kanalas together with his son, Alexius IV.

ever, raised to the supreme power Nicolas Kanalas,
who took the title of Alexius V., and put to death
Alexius IV. In 1204 the French and Venetians took
Constantinople, as well as the European portion of the Sysantian empire, and founded, by raising Baldwin count of Flanders to the throne, the so-called Latin empire (1204-61). Baldwin died 1206, and his brother Henry reigned till 1216. He was succeeded by Peter, count of Auxerre and Courtensy, who reigned only a count of Auxerre and Courtensy, who reigned only a chart time and for the next for your the application. count of Auxerre and Conrienay, who reigned only a short time, and for the next four years the empire was without a ruler. In 1221 Robert, son of Peter, came to the throne, and was succeeded by John of Brienne (1228-37), and the latter by Baldwin II. (1237-61). During the reign of the last of these a great part of the Latin empire was taken possession of by Johannes Vatazes, the successor of Luscaris, who had founded a Greek empire at Nicma, in Asia Minor; and in 1261 his successor, Michael VIII., Palmologus, with the aid of the Genoese, took Coustantinople, and the Latin of the Gencese, took Constantinople, and the Latin empire thus fell. Michael was succeeded by Andronicus II. (1282), who, from 1322, was obliged to divide his power with Andronicus III., who became sole emhis power with Andronicus III., who became sole emperor in 1328. He died 1341, and under his successor, Johannes V. (1341-91), the Turks first obtained a firm footing in Europe. The sultan Murad, in 1361, took possession of Adrianople and made it the seat of government; and his successor, Bajazet, besieged Manuel II., the son of Johannes, in Constantinople itself. In 1422 the capital was a gain besieged by Murad II. Johannes VI. (1425-48), son of Manuel, was in 1444 compelled to pay tribute to the Turks. The last Byzantine emperor was Constantine XI., brother of Johannes. He struggled bravely, but in vain, against the overwhelming forces of the Turks, and at last fell heroically fighting in defence of Constanat last fell heroically fighting in defence of Constantinople, which was captured by Mohammed II., on the 29th May, 1453, and the Byzantino empire was brought to a close .- Ref. Brockhaus' Conversations Lexikon.

BYZANTINE HISTORIANS, is a name given to certain Greek writers who have written on the history of the Bysantine empire. They are divided into three classes:

—1. Those whose works refer exclusively to Byzantine history; 2, those who write on general history, treating also at some length of Byzantine history; and 3. those who have written on Byzantine architecture, antiquities, customs, &c. The works of the Byzantine historians were collected and published by Labbe, Fabrotti, Duffesne, and others, in 42 vols., Paris (1854—1711). A new edition of the Byzantine historians, entitled "Carpus Scriptorum Historiae Byzantine," was commenced at Rome, 1828, by Niebuhr, with the assistance of Bekker, Dindorf, Schopen, Meinecke, and others, and many volumes of it have since been published.

BYZANTINE PAINTING AND SCULPTURE.—Byzantine art may be considered as the connecting link between ancient and moderu art. When Constantine removed the seat of empire from Rome to Constantinople, many an artist that had gained repute in Rome sought to acquire an extension of renown in the new imperial city. There they founded a Byzantine school of art, to which the painters and sculptors of the West resorted when the savage hordes of the North poured over the sunny plains of Southern Europe, and gave the comp de grace to the waning power of the Western empire. In Byzantium, this school preserved the characteristics of ancient art during the sombre dawn of the Mediaval period, when the culture of the fine arts languished and almost died out in other parts of Europe, or became debased and devoid of spirit and beauty. It also struck out a new and original path in desilizing and representing with artistic force and

excellence, both with the pencil and the chiesl, graces and virtues of the Christian faith, in opposit to the efforts of the artists of ancient Greece and Ros to the cutter of the artists of ancient arresposant annual who skilluly expressed the attributes of heathenism. by portraying the perfection of the human form, animated indeed by human passions and desires, but nucontrolled and unsoftened by the elevating influence of that latiful the property of the controlled and unsoftened by the elevating influence of that latiful the property of the controlled and unsoftened by the elevating influence of that latiful the property of the controlled and the property of which they knew not, but the spirit and expression of which the Byzantine artists so thoroughly felt and comprehended. In both painting and sculpture, their works were executed in a careful and pains-taking manner; and mechanical perfection was attained in the manipulation of their subjects and the way in which the separate details were laboriously worked out. The influences of oriental climes and the recollections of ancient art met and mingled on common ground, and united in giving character and originality to the Byzantine school. Their figures are full of dignity; their form, attitude, and expression, betoken them as being conceived in a spirit truly Christian, while the accompany ing details were marked by a symbolism pregnant with meaning; as when the garments of our Saviour, resisting the Spirit of Evil in the hour of his temptation, are painted black, as typical of error and evil, and the Virgin Mary is represented with a black complexion. to signify the bitter woe that wrung that loving mother beart. Indeed, the principal fault in Byzantine art seems to lie in the manner in which its professors strove after perfection in detail, particularly that of a mechanical nature; but, on the other hand, this betokens a true love of art, and a desire to attain a translation in the aright narrawhich they took to becomens a true love of art, and a desire to attain excellence, in the evident care which they took to neglect nothing which might tend to give force or expression to their work. In mosaic-work the Byzantines excelled; the domes of their churches, as well as the pavements and the walls in parts, being beautifully inlaid in elaborate and exquisite tracery, often grotesque in form, glowing with brilliant colours. They possessed goldsmiths and jewellers of no mean order. who were animated by tastes and feelings truly artistic. as may be seen in the magnificent chalices, candelabra, and crosses of the Byzantine period, encrusted in many cases with jewels of great value, that have remained to our own times; they were also exceedingly skilfal in carving in ivory, and in the illumination of copies of the Holy Scriptures. Byzantine art retained its preminence until the close of the 12th century, when it gradually declined, until the conquest of the Eastern empire by the Turks ended the existence of the school that had flourished so long and so successfully. But it had done its work; its professors had carefully pre-served the traditions of bygone ages, and handed them, unimpaired by lapse of time, and accompanied by their unimpaired by lapse of time, and accompanied by their own experience and teaching, to the various schools of Italy, in which its influence may be plainly traced, particularly in those of Sienna and Florence, as exemplified in the painting of St. Peter and St. John, by Pierrolino (1100), in the Academy of Fine Arts of Sienna, and that of the Virgin and Child, by Guido di Ghezzo (1221), in the church of San Domenico, in the same city, and in many of the works of Cimabue, Giotto, and Leonardo da Vinci, who flourished at Florence at later partical a later period.

BYZANTINE RECENSION, is the name given to the text of the Greek New Testament as propagated within the limits of the patriarchate of Constantinople.

C. ·

C the third letter, and second consonant of our alphabet, bet, has two sounds, being pronounced like k before the rowels a, o, and u, and like s before e, i, and y. This letter is first met with in the Latin alphabet, where it occupies the same place as the gamma or g in the Greek; and, indeed, originally it had the same sound; legiones, with the earlier Komans, being written leciones. Subsequently the g sound became hardened to that of k, and that was the only pronunciation that it afterwards had with the Romans, as we know from the circumstance, that whenever the Greeks had occasion to adopt Latin words with c into their language, they always represented it by k; as Cleero, Kikero; Cæsur, Kaisar. As regards sound, C is a

#### Cleaha

sujections letter in English, as its place could always be supplied either by k or a. As a numeral, C stands for 100, CC for 200; and so on. In music it as the name of one of the notes of the gamut. Placed after the clef, it intimates that the nucic is in common time, which is either quick or slow as it is joined with allegre or adagto; but if alone, it is usually adagto. If the C be crossed or turned, the first requires the six to be alwayd quick the letter the requires the

ar to be played quick, the last very quick.

CAIRA. (See KAIRA.)

CAIRA. (See KAIRA.)

CAIRA RAO (Fr.), an abbreviation of the word cabriolet. It is a small light carriage for one horse, which generally plies for hire, although some gentlemen have private cabs of their own.

Cana, ku'-ba, a Jewish measure, the sixth part of a seah, or satum, and the eighteenth part of an ephah. It was equal to 31 pints of our wine measure, or 25

pints of our corn measure.

\*\*CABAL, kā-bal' (Fr. cabale), a number of persons united together for some secret design, usually to promote their own private views in church or state by intrigue. It differs from party as being usually by intrigue. It differs from party as Deing usuany composed of a few persons, and it generally implies secrecy and intrigues. In History, it is a name given to the ministry of Charles II., consisting of five men famous for their intrigues, and the initial letters of whose names form the word Cabal; viz., Clifford, Ashley, Buckingham, Arlington, and Lauderdale. "Never," says Hume, "was there a more dangerous ministry in England, nor any more noted for pernicions connects." cious counsels.

CABALLABIA, & db-bd-lai'-ri-a, in Middle-Age writers denotes lands held by the tenure of furnishing a horseman with suitable equipment during war, or when the lord had occasion for him.

CARRAGE. (See Brassica.)
CARRAGE. (See Brassica.)
CARRAGE BARK. (See Andira.)
CARRAGE FLIT, kibb-big (Anthomyte Brassice), an insect of the same gen. as the beet-fly and turnipfly. Its larva feed upon the roots of cabbage, and often do great injury. It is about a quarter of an inch long, and the expanse of its wings is about half an inch. The colour of the male and female is dark grey. The face of the male is silvery grey, with a dark streak on the forehead; the abdomen is linear, and the eyes nearly meet together on the crown of the bead. The face of the female is whiter than that of head. The face of the female is whiter than that of the male, and there is no dark streak on the forchead; the eyes are wide apart, and there is a broad black stripe between them; the abdomen of the female also terminates conically. The larver, which are yellowish-white in colour, closely resemble those of the common fiesh-fly.

CABBACH PALM, a name commonly given to a palm having a tender terminal bud, which is boiled and eaten as a vegetable. (See Abeca, Chamerors, Euterpe.) Cabbata, käb-öd-ü (Heb., traditions), is a term cometimes used in a large sense to denote all the

traditions which the Jews profess to have received from their fathers; in a more restricted sense, it is applied to a species of theology and philosophy made up of mystical interpretations and metaphysical speculations concerning the Deity and other beings, said to have been handed down by a secret tradition from the earliest ages. Some of the rubbins pretend that the origin of the Cabbala is to be referred to the angels, and that the angel Raziel instructed Adam in it. According to the Maimonides, God, when he delivered the law to Moses, gave him also the explanation of it. This explanation he communicated to Aaron and the elders, and it was afterwards handed down traditionally from father to son. In truth, these explanations of the law are only the interpretations and decisions of the gabbins on the law of Moses, in the framing of which they studied principally the combinations of particular more seamen principally the combinations of particular words, letters, and numbers, and by that means pre-tended to discover the true sense of the difficult passages of Scripture. The Cabbala is divided into the symbolical and the real. The former consists in seeking abstruse and mysterious significations in a word by attributing certain values or meanings to the to the symbolical, and comprehends doctrines, is divided into the theoretical and practical. The aim of the theoretical is to explain Scripture according to the Theoretical is to explain Scripture according to the Date of the best home, twisted very strongly and compactive. The general number of strands in a rope cable is three,

seemst traditions, and to form therefrom a philosophical system of metaphysics, physics, and manmatching. The practical, on the other hand, pretends to teach the art of performing miracles by an artificial application of the divine names and centences of Scripture. Some of the Jews believe that Jesus Christ wrought his miracles by virtue of the mysteries of the Cabbals. Carrianters, kiti-ba-lists, are those Jowish doctors who profess the study of the Cabbals. The first cabbalistic author that is known is Simon son of Joschai, who is said to have lived a little before the destruction of Jerusalem by Titus, and is the author of

struction of Jerusalem by Titus, and is the author of a book entitled "Zohar."

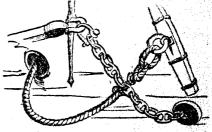
Cabin, kāb'-in (Fr. cubane), a term in Mar, used to denote certain apartments in a ship, designed for the In ships of use of either the officers or passengers. war there are several cabins, the principal of which (for the use of the chief officer) is called the state cabin, for the use of the cine officer is called very projecting and is furnished with a balcony or gallery, projecting over the stern. The apartments where the other officers sleep and mess are usually called berthe. In Virginia ginia, the habitations of the Indians are called cabina. They generally stand about nine or ten feet in height and are made by fixing poles in the ground and fasten-ing them together at the top; these poles are then covered with bark, a hole being left in the roof to carry off the smoke.

CABINET, kub'-i-net, denotes a closet or retired apartment; also a private room in which consultations are held. In the abode of a prince, the cabinet was an apartment where he transacted the business of the state, advised with his privy counsellors, and issued his decrees. Hence the name came to be applied to the counsellors chosen by monarchs to advise with them on the course of public affairs, and to direct the higher on the course of public mains, and to discountry, the branches of the administration. In this country, the privy council was formerly the adviser of the king in all weighty matters of state; but, by degrees, a selection of the members of this body came to be made by the king for more private advice, and at length, in the reign of William III., the distinction of the cabinet from the privy council, and the exclusion of the latter from all business of state, became fully established. The first lord of the treasury, the lord chancellor, chancellor, of the exclusion of the private and the state of the private of th cellor of the exchequer, president of the privy council, and the secretaries of state, now five in number. have always seats in the cabinet, and with them are usually associated nearly an equal number of their colleagues in the ministry, presiding over other important depart. ments of the government.

Cabini, kab'-e-re. the name given to mystical deities of antiquity venerated in Egypt, Phonicia, Asia Minor, and Greece, but of whose nature and functions little is known. In Greece, their rites were performed with great ceremony in Samothrace, Lemnos, and Imbros; in Asia Misor at Pergamus; in Phonicia at Berytus; and in Egypt at Memphis. Their names, number, character, and other particulars, are given so diversely by different authors, that little can be affirmed with certainty regarding them. The festivals celebrated in bonour of the Cabiri were called Cabiria.

in honour of the Cauri were cance consers.

Cable, kait'-! (Fr. Sp.).—This term is employed on board ship to denote either a large rope or a strong chain generally attached to the anchor. Rope cables, which



## Cabombacem

but some are made with four. The strength of a good shie six inches in diameter has been reckened to be equal to sixty tons. Chain cables, although they are much heavier and possess less elasticity than rope cables, are now very generally adopted in all classes of vessels. They are composed of iron links, the length of which is usually about is it diameters of the iron of which it is made, and the breadth about 34 diameters. or which is usually about six diameters of the iron of which it is made, and the breadth about 34 diameters. All chair cables made for the government are required to be manufactured in lengths of 124 fathoms. In the middle of every other length there must be a swivel, and in each length a joining-shackle. The links are made of bar iron, and the sizes of chain cables are denoted by the thickness of the bar iron used. Each link is bent into a nearly oval form, and is strengthaned. link is bent into a nearly oval form, and is strengthened

in the middle by a stay-pin of cast iron.

Cabondaces, kai-bom-bai-se-e, in Bot., the Water shield fam., a nat. ord. of plants in the class Dicotyledomes, sub-class Thalamifore,—aquatic plants with floating peltate leaves; sepals and petals 3 or 4, alternating with each other; stamens definite or numerous; thasame flattened, small; carpels 2 or more, distinct; frait indehiscent; seeds few; embryo minute, inclosed in a vitellus, and outside of abundant fleshy albumen. There are only two genera belonging to the order; namely, Cabomba and Hydropeltis. The species occur in America, Australia, and India; they have no important properties. Hydropeltie purpurea is said to be

nutritions CAROTZ, ka-boots', a name for the drug Koussoo. (See

BRATERA.)

CACAO, or COCOA. (See THROBROMA.) CACHALONG, kash'-ā-long, a tine variety of opal, found on the borders of the river Cach, in Bucharia. [See OPal.] A specimen from the Faroe Islands consisted of silica 95-32, water 3-47, and traces of iron, potash, soda, lime, and magnesia.

CACHALOT. (See Sperm Whale.)
CACHE, kash (Fr., a lurking-hole).—The settlers in the west of North America, when crossing over the Rocky Mountains, often find it advantageous to disburden themselves of some of the articles which they are carrying. In order that they may gain possession of them on their return, they are in the hubit of digging holes, in which they place the provisions or other arti-cles, and then cover the place up. These holes, or places of concealment, are called caches. The construction of a cache is a work of great ingenuity and labour. A hole six or eight feet deep, and several feet broad, is first dug; the articles to be concealed are then put in, and the hole is filled up, the surface being carefully replaced, so as to show no sign. Landmarks are, however, noted, and the locality of the cache is Landmarks easily found when the travellers return.

CACHET, LETTERS DE, kash'-ai, were secret warrants proceeding from, and signed by, the kings of France, and countersigned by a secretary of state, by which any person could be imprisoned or banished to a certain place without any reason being assigned. The introduc-tion of them is ascribed to the famous Capuchin Padre Joseph, under the ministry of Cardinal Richelieu. They were also called lettres closes, or scaled letters, to distinguish them from lettres patentes, or public docu-ments. During the reign of Louis XIV. lettres de sacket might be obtained by any one who had influence with the king or his ministers, and were frequently resorted to as a means of gratifying private revenge. During the reign of Louis XV, they were often given away to favourites as cartes blanches, with only the king's signature, so that any names might be inserted.

CACHERIA, kāk-ex'-i-ii (Gr. kukos, bad, hexis, habit), is a term used in Med. to denote a bad condition or habit of body, arising from whatever cause, in which the functions are imperfectly performed, and the com-plexion unhealthy. It is employed by Cullen to denote plexion unhealthy. It is employed by Cullen to denote a particular class of diseases in which the general habit is affected; and a change of complexion, with emaciation or morbid enlargement, are characteristic symptoms;

as, jaundice, dropey, &c.
Cactous, kdi-seek, the title given to the native chiefs
in some parts of America at the time of the conquest

by the Spaniards: it signifies "lord" or "master."

CACODEMON, kith-o-de-mon (Gr. kakos, bad, and suman, demon), denotes an evil or mischievous demon or epirit. (See Demon.)

# Caddice-worm

CACONT. £86'o-86 (C.H.As or Kd), sa a metallic base, containing areano. It is prepared its chloride by the action of zine. It is a thin, he chloride by the action of line. At it a lim, areas parent, colourless liquid, resembling arranted the discount of liquid, resembling arranted the pouree into oxygen, chlorine, or the air, it inflames. It boss at 338° Fahr., and crystallizes in large transparent square prisms when cooled down to 21° Fahr. At forms salts with the halogens and acids. It also forms an acid containing three equivalents of oxygen. This acid is peculiar as possessing no poisonous pro-perty, though containing nearly half its weight of arsenic.

CACCRINES, kak-o-e'-thes (Gr. kakes, bad, ethes, disposition), a bad custom, disposition, or habit; as the caccethes scribendi, the desire for acribbling. An incurable cancer is also called a cacoethes in medi-

CACOPHONY, kd-kef'-o-ne (Gr. kakes, bad, phone, voice, sound), in Grum., is a fault of style, consisting in the bringing together of two letters or syllables which produce a harsh or disagreeable sound, or in the too frequent repetition of the same letters or syllables,

CACTACER, kak-tai-se-e, in Bot., the Cactus or Indian Fig fam., a nat. ord. of plants belonging to the class Dicotyledones and the sub-class Calyciflore. The Cactuces are remarkable for their succulence, for the great development of their cellular tissue, and the anomalous forms of their stems, which are globular, columnar, flattened, or angular. Most of the species are leafless, having tufts of hairs or spines inste the senses, the flowers are sessile, sometimes very showy; the sepsis and petals are usually numerous, and scarcely distinguishable from each other. The stamens originate in the orifice of the tube formed by the originate in the orince of the tube formed by the combination of the petals and sepals, are very numerous, and consist of delicate thread-like fiaments terminated by small roundish authers. The overy, which, in consequence of its adhesion to the sepals, seems to occupy the place of the flower-stalk, consists of a single cell lined with nariotal placents or comments. of a single cell lined with parietal placentas, covered over with minute ovules; its style is slender, with stigmas equal in number to the placentas. The fruit is succulent, and contains a great number of seeds, which are without albumen. These plants are natives of the tropical regions of America. There are 18 genera and about 800 supposed species. Many 18 genera and about 800 supposed species vield edible fruit, useful in febrile complaints. Cattle feed on the succulent stems of some species during the dry season in certain districts of South America One plant belonging to the order is largely cultivated in Mexico for the nourishment of the cochineal insect; and numerous species are grown in European conservatories on account of their splendid flowers, or their

vatorics on account of their splendid flowers, or their singular forms. The most interesting species are described under the names of the genera to which they belong. (See CEREUS, BERNOGACTUS, OPUNTIA, PERESKIA.)

CACTUS, Käli-tus, the name under which Lännsens included the Cactacce, believing that they formed a single genus. The name still continues in popular use, being applied to any plant in the order. (See CACTACES.) The term appears to have been adopted from Theophrastus, who used it to describe a spiny plant. plant.

CADARI, or KADARI, kad-a'-re, a sect of Mohammedans, who assert free-will in opposition to fate, deny the existence of any secret power in determining the will, and reject all absolute decrees and predestination. The author of this sect was Mabed ben Kaled al Giho-

ni, who suffered martyrdom for his belief.

Caddice-worm, kad'-dis, the common name of the species of Phryganea which reside in the water in cases, which they form of various substances, such as bits of stick, grains of seed, small stones, &c., held together by a silken thread, secreted in their bodies in the same manner as in the silkworm. The perfect insect, the caddis-fly (Phryganea grandis), has a body of a leathery consistence, and thickly clothed with hair; shead small, with semi-globular eyes; antennas as long as the body; anterior wings elongated, lanceolate in the females, but rather more situes in the males. They are very active, moving with a gliding motion; but their flight is awkward. They frequent damp and marsby situations. When handled, they emit a very species of Phryganea which reside in the water in cases,

# Cadence

unpleasant odour. Their colours are ordinarily brown

or grey.

Capence, kail-dense (Fr. addence; Lat. cadens, from CADENCE, Kerl-dense (Fr. cadence; Lat. cadens, from cade, I fall), in Mus., a term signifying a fall or pause, either at the end of a piece, or at the termination of each of its parts. In vocal or instrumental music, cadences are used for the same purpose as stops in writing; i.e., to indicate the terminations, either of the parts into which a composition is divided, or the sunclusions of entire pieces; as in writing, stops mark the divisions, or completion of a sentence. There are two kinds of cadences,—viz., middle and all? the former, like commas and semicolons in writing, divide the various parts of a composition; whereas the latter denotes the conclusion of a piece.

CADET, MILITARY, kil-det (Fr. cadet, vounger in

Theress the latter denotes the concussion of a piece.

Cader, Military, kà'-det' (Fr. cadet, younger in service), a youth who is trained up for the army by a source of military study and discipline. When the friends of any youth intended for the army wish to give him a sound military education, they enter his name at the Cadets' College. There they supply him with board, lodging, clothing, books, and instruments. The annual expense thus entailed varies from £100 to £20. The age of admission is between 16 and 19, and the subjects of study are English composition, modern languages, mathematics, natural and experithern languages, mathematics, natural and experimental sciences, history, geography, and drawing. Every student can go up for examination in any hulf-year and the results of the examination are reported to the commander-in-chief. As soon as vacancies occur in the college, they are filled up by the candidates in the order of merit. After being entered, they study for two years a great variety of subjects connected with theoretical and practical military art. When this course of study is complete, the cadets are eligible for commissions in the army, a certain number of which are at the disposal of the college. Queen's cadets are the sons of officers who have fallen in action or have died from the effects of active service, and have left their families in reduced circumstances. They are twenty in number, and are admitted and educated gratuitously. When the East-India Comeducated gratuitously. When the East-India Company possessed both military and political power in India, upwards of 5,000 officers were in their pay. The sompany established a college or school at Addiscombe, where youths were examined as to their proficiency in an ordinary English education. If they passed sutinfactorily, they were admitted into the college. The lage of admission was between 14 and 18. After two was a study in the college of the passed sutinfactorily and the superior of the second s years' study in the college, they became cadets in the years study in the conject, they oceans cates in the company's service, receiving pay and being eligible for service in India. Thus the officers who commanded the company's regiments had been educated by the company. The introduction of competition in the matter of appointments to the college, and the transference of the powers of the company to the crown, have greatly modified this class of military cadets. The word cadet is also applied to any younger member of a noble family, in order to distinguish him from the eldest son, and in France to any junior officer, in con-

tradistinction to one who is his superior.

CADET, NAVAL, an officer of the lowest rank in the British navy. On being appointed to a ship, every captain is permitted to nominate one cadet; and every fing-officer on receiving his flag can appoint two. The first lord of the Admiralty appoints all the rest, who are subjected to competitive examination. The candidates, who enter the service at the age of 12 to 14, are examined at the Royal Naval College at Portsmouth. If they pass their examination in a satisfactory manner, they are sent to a training ship at Plymouth or Ports. mouth, in order to learn seamanship, &c. If they do not make sufficient progress at this stage, they are rejected; but if they give satisfaction, they are put on board sea-going vessels. Here they are expected to note care-fully all that is going on; to salute the officers, and to learn the different ways of splicing ropes, tying knots, arranging the rigging, going aloft, keeping watch, &c. The cudet becomes a midshipman after serving satisfactority three months in a training ship and afteen

months in a sea-going ship.

Cant, or Kant, ka'-de, ds a Turkish word signifying some learned in the law, one who decides in judicial sators and matters, a judge. The cadi is an inferior judge, and is raids. It established in the towns and villages; while the mollah,

## Cadveeus

or apperior judge, is over a province. Both are chosen from the higher ranks of the priesthood, as all law is founded on the Koran.

CADIZADELITES, kai-diz-of-de-lites, a sect of Moham-medans, who resemble the ancient Stoics, assuming an uncommon gravity of manner and avoiding all feature and amusements. They receive both the Bible and the Koran, assimilate in many things to the Christians, and believe that Mohammed was the Holy Ghost whom Christ said was to be sent.

Christ said was to be sent.

CADMENT LETTERS, kidl-me-an, the name given
to the sixteen letters that originally composed the
Greek alphabet, and which, according to tradition,
were brought by Cadmus from Phonoicia, whence they
were called grammata Kadmeia, Cudmean letters. In reality, they are found to agree, in form and order, with the Samaritan or Phonician letters.

Cadmium, kud'-me-um (symbol Cd, equivalent 56 74, spec. grav. 8 6).—Cadmium was first discovered in 1818, by Stromeyer, in small quantities in certain zine ores, in consequence of the behaviour of their solutions with sulphuretted hydrogen. It is occasionally found in nature as a sulphide in zinc ores, and is obtained as an accidental product during the extraction of that metal. Being much more volatile than zinc, the first portions of the distilled metal contain a large proportion of cadmium. It is separated from the zinc by means of canmum. It is separated in our and white colour, much resembling tin in its physical properties. It is soft, malleable, and ductile, and when bent emits a creaking sound, like tin. It is easily fused, and distils at a high temperature. When heated in air, it oxidizes more temperature. readily than zine, burning with a luminous flame, and producing a reddish-brown oxide. It fuses at 442° Fahr, and by slow cooling may be obtained in beautiful octahedral crystals. When heated in dilute hydrochloric or sulphuric acid, it evolves bydrogen. hydrochloric or sulphuric scid, it evolves bydrogen it only forms one oxide, CdO, which is formed when cadmium is heated in air. It is yellow, brown, or black, according to the temperature to which it has been exposed. It is infusible, does not volatilize, and forms well-marked saits with the acids. The chloride is formed by dissolving the metal in hydrochloric scid. It crystallizes in four-sided prisms. The sulphide, which is obtained by heating a mixture of oxide of cadmium and sulphur, is much used as a pigment. It is of a bright yellow colour, but becomes temporarily is of a bright yellow colour, but becomes temporarily red on being heated. The only other important salt is the iodide, which has of late received an important application in photography. Being a very stable salt, it is not decomposed when added to collodion. For this reason, collodion indized with it preserves its sensitiveness undiminished during many months. For photographic purposes, it should be purchased at a respectable chemist's, as it is a salt that is very difficult to prepare for oneself.

CADRITES, kad-ri'-tees, a kind of Mohammedan monks named after their founder, Abdul Cadri. They live together in monasteries, which, however, they may quit when they please and marry, on condition of wearing black buttons on their garrents, to distinguish them from the rest of the people.

Caduceus, kā-du'-se-us, in Antiq., was the winged staff or sceptre of Mercury, said to have been presented to him by Apollo in return for the sevenharp etringed which Mercury given to had bim. Amongst the ancient Greeks and Romans, the caduceus was the staff of office borne by ambassadors and he-



MARCURY REARING CADUCANA

cumstance, doubtless, that it become a symbol of Marcury, the messenger of the gods. Originally, it was a simple olive-branch; then a white or gilded staff, round which was added in a later age the representation of two twisted snakes, with two outstaticked wines above them. Many mythological representation of two twisted anakes, with two out-stratched wings above them. Many mythological legends are connected with the addition of the enakes. One tale relates that Mercury with his caduceus sepa-rated two anakes that were lighting. Hence the wand began to be the symbol of peacemaking, and the figures of the serpents were retained. The Roman sent to the Carthaginians a measenger bearing a esduceus and a javelin; thus offering them the choice of peace or war: and in old Roman coins Mars is often of peace or war; and in old Roman coins Mars is often represented with the caduceus in one hand and a javelin in the other. Mercury was considered to be the patron of commerce, and the rod of the caduceus signified power, the serpents prudence, and the wings diligence. It is still used in modern times as the symbol or representative of commerce.

symbol or representative of commerce.

Caddoos, ki-du'-kus (probably from caduc, fleeting, frail), in Bot., falling early or soon after development. Thus, a calvx is said to be caducous when it falls off before the flower expands, as in the poppy.

CECUM, se'-kum (Lat. cacus, blind), in Anat., is the dame given to a large blind-pouch, or cul-de-suc, and the pairs of the commencement of the

extending downwards from the commencement of the

extending downwards from the commendation of the large intestine. (See Intestines).

CAEN STONE, kan(g), in Geol., an colitic limestone, so termed from its being extensively quarried in the neighbourhood of Caen, in Normandy. It is the French representative of our Great, or Bath solitic. It forms an admirable building-stone; for though it is

It forms an admirable building stone; for though it is soft in the quarry, it hardens on exposure, and is found by be exceedingly durable.

CESALPINIA, se-zāl-più-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-i-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-i-a, (so named in honour of CESALPINIA, se-zāl-più-i-a, (so named in hon America and Asis, having pinnate or bipinnate leaves, showy yellow flowers, and stems which are usually more or less prickly. The useful products of the genus are snowy yearow howers, are the serial products of the genus are very numerous. The valuable dye-wood known in commerce as Brazil-wood, is said to be obtained from the species C. crista. It is used for dyeing red, rose-colour, and yellow. Braziletto-wood, which produces the state of the serial to come from C. braziletto-wood which produces the serial serial to come from C. braziletto-wood which produces the serial serial to come from C. braziletto-wood which produces the serial serial to come from C. braziletto-wood which produces the serial serial serial to come from C. braziletto-wood which produces the serial serial serial to come from C. braziletto-wood which produces the serial fine red and orange tints, is said to come from C. brame rea and orange time, research wood, which is extensively used for dyeing red or peach-colour, is probably the produce of *C. echinata*. The exact species yielding these three dye-woods have not, however, as yielding these turee dye-woods have not, however, as yet, been determined with certainty. Another valuable dye-stuff, also giving a red colour, is obtained from the Asiatic species C. suppan, and is known as Sappan, Bookum, or Bukkum-wood. The roots of this tree, under the names of Sappan, and is known as Sappan, and the roots of this tree, under the names of Sappan-root and yellow-wood, are under the names of Sappan-root and yellow-wood, are sometimes imported from Singapore, and employed for dyeing yellow. The twisted legumes of C. coriaria are powerfully astringent, and are extensively used in tanning. In commerce they are known as Divi-divi, or Libi-dibi pods. The legumes of C. Papai, the Pi-pi of commerce, are employed for similar purposes, but they are very inferior to them. The roots of C. moriand and upon are said to be diurctic, and the wood of ge and nuge are said to be diuretic, and the wood of C. echinate is stated to possess tonic properties. From C. eleosperms an oil is obtained.

C. geacoperms at on is obtained.

C. Exalivitine, see-e, in Bot., a sub-ord, of
the Leguminosa, or Bean am., characterized by irregular
flowers, which are not penilionaceous, and by the petals
being imbricated in the bud, with the upper or odd
petal inside the leteral ones. The genera belong to the warm regions of the globe, and some of the species the warm regions of the globe, and some of the species the locust-trees for example—grow to a prodigious size. (See HYMENEA.) Among the products of this suborder useful to man, are many valuable dye-woods; such as Brazil-wood (Casalpinia), logwood (Hamatoxylon), and barwood (Haphia); many excellent kinds of timber; some important medicines, as sensa (Cassia), and balsam of Copais (Copaijera); edible fruits, as the tamarinds (Tamarindus, Codarium), and halsam of Copain (Casalpinia). (Cassia), and balsam of Copails (Copailsra); edible The flercer animals were conveyed in iron cages. Wild fruits, as the tamarinds (Tamarindus, Codarium), and balsam of Ceratonia); tanning substances, fibres, and gums.

CRSAM, se'-car, a title borne by all the emperors of the carbot keep in the carbot control of the carbot contr

and greatest Cassar, the title Augustus Cass given to the reigning emperor, and that of C the heir-apparent.

the herr-apparent.

OEBSHAN OFRENTON, se-ray-re-on [Lat. come, from ondo, I cut), in Surg., is the extraction of a child from the womb by an incision through the parietes of the abdomen and the uterus. It is also called hydrocross, from hustera, the womb, and tome, a section. This operation has been practised from very ancient times, and persons so extracted were termed organize. Julius Casar is said to have received his name from his have been throught into the wold in this way. ing been brought into the world in this way. There are three cases in which this operation may be necessary:

1. When the fectus is alive and the mother dead, either in labour or in the last two months of pregnancy; 2. when the fœtus is dead but cannot be delivered in the usual way, on account of the deformity of the mother, or the disproportionate size of the child; 3. when both mother and child are alive, but delivery cannot take place, from any of the above causes. The operation is one of great danger, but there are many instances of both mother and child having lived after its perform-

Castus, sees'-tus (Lat.), in Antiq., a rough gaundlet made of raw hide, and strengthened with lead or plates of raw inde, and strengthened with the project of iron. It was used by the wrestlers both to protect their hands and wrists, and to give force to their blows. The crestus was also a kind of girdle made of wool, which the husband untied for his bride

The first evening after marriage.

CESURA, ec.su'-ra (Lat. cado, I cut), in Greek and
Latin poetry denotes the cutting off of the last syllable Datin poerly denotes the entering out the assignment of a word from those that precede it, and carrying it forward into another foot. It always renders the syllable on which it falls long, though it may properly be short. In modern poetry it denotes the passes which is introduced into a verse or line to render the versification more melodious, and to aid the recital

CETERIS PARISUS, se'-te-ris par'-i-bus (Lat., other things being alike or equal), is a term frequently employed by mathematicians and philosophers to denote the equality of all other points or circumstances except the equanty of an other points of circumstances except those at issue; as when it is said that the velocity and quantity of blood circulating in a given time through any section of an artery will, caterie paribus, be ac-cording to its dismeter and its nearness to, or distance from, the heart.

CAFFRINE, Or THEINE, kaffeen' (C. H. N.O.).
a crystalline alkaloid found in tea, coffee, Paraguay
tea, and in guarana, a species of chocolate prepared
from the fruit of the Paullinia sorbites. Tea contains from 2 to 4 per cent. of caffeine, coffee but 1 per cent. It is easily obtained from tea by making a strong infu-It is easily obtained from tea by making a strong infusion of the leaves, mixing it with subsectate of lead, which precipitates the tamin, and transmitting a current of sulphuretted hydrogen through the liquid to precipitate the excess of lead. On evaporating the solution, and allowing it to cool, the caffeine crystallizes out in long silky needles. It has a weak, hitter tasts, and fuses at 352°. Water and alcohol dissolve but a small quantity in cold, but it is very soluble in boiling water and ether. The fact that caffeine forms the essential principle of three substances used by widely different nations is a very curious one. and widely different nations is a very curious one, and shows that the craving which it satisfies is as natural as it is universal. The use of tea or coffee as an article of diet seems to exercise a very important influence in retarding the waste in the tissues of the body. Its effect on the human system has, however, yet to be fully studied.

CAFFIRS. (See KAFFIRS.)

CAFFRE-BREAD. (See ENCEPHALARTOS.) CAGE, kaij (Fr. cage), an inclosure made of boards, or with lattice-work of wood, wicker, or wire, for confining birds or beasts. Beasts were generally brought to Rome, in ancient times, shut up in cages made of oak, or beech, ingeniously formed, and covered with green boughs, in order that the animals might be deceived and fancy that they were still in their forest

#### Catanagam

tain essemblies; as those of the clergy, the states general, &c.

CATRACAM, or KAIRACAN, beil-mel-ken, a dignity in the Ottoman empire answering to that of lieutenant, stenant-governor, among us. There are usually two Caimecams, one residing at Constantinople, as th governor; the other attending the grand vizier in the quality of lieutenant. Sometimes there is a third at-

tending the grand signior.

Carmozoro, kain-o-so'-ik (Gr. kainos, recent, soc, life) a Geol, a term applied to the upper stratified systems selding recent forms of life, as distinguished from Meossic (holding intermediate), and Pulsozoic (holding section and extinct forms). The oninozoic period emconsists and extinct forms). The caincoin period embraces the tertiary and post-tertiary systems of British cologists. (See Grology.)

Caintres, kain-ites, a perverse and stupid sect of hereties that arose in the 2nd century, and took their name from Cain, whom they reckoned worthy of special.

conour. All the wicked persons mentioned in they looked upon with favour; even Judas Is carlot, whom they regarded as worthy of praise from having caused the death of Christ, and thereby saved the world.

"CA IBA, sa e'-ra (Fr., it will go on), is the name given from the refrain to a well-known song, by which, during the first French revolution, the lower classes were inflamed and incited to deeds of crucky. The famous Marseillaise was directed against the foreign, and the ra ira against the aristocrats, the domestic, enemics of the revolution.

"Ah, ça ira, ça ira, ça ira ! Les aristocrates à la lanterne!"

The melody is older than the words, having been a favourite air with queen Marie Antoinette.

CAIRN, kairn, is a word of Celtic origin, denoting a heap or pile of stones. The term is commonly applied to the artificial piles of stones, usually of a conical form, that are to be met with in various districts. They appear to have been raised for various purposes, as to distinguish marches or boundaries stinguish marches or boundaries, to commemorate battles; but, most commonly, they were intended to mark the burial-places of distinguished individuals. The bones found in cairus are generally half-burned, and are inclosed in cists, or stone chests, or in urns of earthenware. In one case, as many as seventeen stone chests were found under the same cairn .- (Pennant.) Various articles in common use, as flint arrow-heads. stone hammers, &c., or ornaments, are frequently found along with the bones. The size of these cairus is believed to have been, in general, in proportion to the rank or popularity of the deceased; for, not only would the people of the district assemble to testify their respect to him, but, so long as the memory of him existed, not a passenger went by without adding a stone to the heap. "To this moment," says Pennant, "a suppliant will tell his patron curri mi cloch er do charne (I will add a stone to your cairn), meaning, when you see no more, I will do all possible honour to your memory." Some of the larger carns are communication, have internal galleries, or chambers. The most remarkable of this class is at New Grange, near Drogmarkance or unis cases is at New Grange, near Drog-heda, in Ireland. Cairns belong chiefly to stony countries; where stones are acarce, earthen tumuli take their place. They are to be found throughout the British islands, in France (especially Brittauy), and Norway; but in Germany, Denmark, Sweden, and other parts of Europe, tumuli are more common.

CAIRMOOM, or CAIRMOORUM, kairm-form, a smoky-tinted variety of quartz, often of a fine brown or amber colour. It receives its name from the mountain Cairngorm, on the sides of which it is found in great perfection. It is sometimes so dark as to be marry black. It is much used for seals, brooches, and the larger forms of jewellery; and one Ediuburgh lapidary is said to have cut nearly £400 worth from a single

Crystal.

Carsson, kais'-son (Fr. caisson, a chest), a term applied in Civ. Eag. to large frameworks of timber, used plied in Civ. Eag. to targe transewors or a bridge, or in forming a foundation for the piers of a bridge, or any structure, a portion of which is built in deep water. Casseons are now only used for this purpose in cases where the bottom is rocky, as it has been found that the underlying strate, if of a different nature, are apt 894

# Calenus

to be undermined and worn away by the action of the to be undermined and work away by the action of size water, to the detriment of the superstructure; as in the case of old Westminster bridge, the foundations of which were made in this manner in 1740, by Labeleye, a Swiss engineer, and which has been lately replaced by the present structure. The following was the method adopted:—When the bottom had been prepared and labeled a belief framing was the method scoped.—When the bottom had been prepared and levelled, a hollow framing was brought ever the spot, and, as soon as a sufficient quantity of masonry had been piled upon it, it was pierced and sunk. Caissons are now made open at both ends, and filled cansons are now made open at both ends, and filled with concrete, to insure solidity. Docks are sometimes closed by caisson-gates, especially if it is not necessary to open them very often. In Mar, the caisson is a machine for raising vessels, resembling an enormous chest, with an air-tight chamber in the interior, which will not allow it to which believe agants in dank it. will not allow it to sink below a certain depth. In order to raise the vessel, it is sunk, by letting the water into it, and brought under the ship's bottom, and there seems to be a superior of the same that the same that it is not that it is not the same that it is not the same that it is not cured. The holes, through which the water entered, are then closed, and the water pumped out. This causes it to rise and lift the vessel, bringing the bottom out of the water for inspection and repairs, which can be thus effected without bringing the vessel into dock, or hauling her on shore. In Mil., it is applied to the tumbril, or waggon, in which ammunition is carried; and to a large wooden chest filled with powder and shells, and buried under, or near, any fortifications, to

be exploded, if necessary, like a mine.

CAITHNESS FLAGS, koith-ness', in Geol., a series of dark-coloured flaggy beds, belonging to the middle portion of the Old Red Sandstone as developed in Scotland. These bods are rich in fossil fishes. The stone is of The stone is of great toughness and durability, and is largely employed

for paving.

CATUS COLLEGE (keys), Cambridge, or more properly, Gonville and Caius College, was founded in 1348, by Edmund Gonville, rector of Terrington, in Norfolk, and endowed for a master and three fellows. Various benefactors afterwards added to its endow-ments, and in 1558, John Caius, M.D., having rebuilt a large part of the college, and endowed three additional fellowships and twenty scholarships, obtained a royal charter, by which the former foundations were all con firmed, and his own foundation established, the name of the coilege to be, thenceforward, Gonville and Caius College. New statues have been given under act of parliament, 19 & 20 Vict. c. SS, by which the college is henceforth to cousist of a master, thirty fellows, and thirty-six scholars. The fellowships are all open, and are not vacated by marriage, but terminate, in general, at the end of ten years from the full standing of M.A. They may, however, be retained under certain circumstances and, if the fellow be holding, or have held, certain university or college offices, or shall have taken holy orders within five years after attaining the standing of M.A., or shall have been permitted, by special vote of the master and fellows, to retain it. Twelve of the fellows are seniors, the other eighteen are juniors. They are to be chosen from graduates of the college (ar, if the master and seniors shall at any time seafit, of th university) who have distinguished themselves in the studies of the university, or in some department of science, literature, or art. The thirty-six scholarships are divided into four classes, of different value, from £60 to £20, and are perfectly open. They are tenable until the scholars are of standing to take the degree of B.A., and may, in special cases, be continued until the holder is of standing to take M.A. There are also connected with this college four studentships in medicine. founded by Christopher Tancred, Esq., each of the annual value of £113, which may be held for three years after taking B.M.; two scholarships, of the annual value of £52. 10s., founded in 1830, by John Sayer, and in the presentation of the governors of Harrow school; and two exhibitions at Harrow school founded by John Lyon, 1890, each £10 yearly, for four years.—Ref. Cambridge University Calendar.

CAJANUS, kāj'-d-nus (from the Malsyname Catjang),

in Bot., a gen. of plants belonging to the nat. ord. Leguminose, sub-ord. Popilionaces. The species yield a kind of pulse, known as pigeou-peas, much used for food by the poor of the West Indies. In Jamaics. pigeons are usually fed with these seeds; hence their English name.

# Cajaput

Cararut. (See Malateuca.) Unlanden, kal-d-bash' (Sp. calabasa), a name given to vessels made from the hard shell of the fruit of



CALABASHES

the calabash-tree. These are much used on the West Indies and tropical parts of America, and serve as buttles. cups, goblets, &c., for holding liquids. They are often elaborately carved. and ornamented with various colours. The cala-bash will sustain a

considerable amount of heat, and it is sometimes used Dried gourd-shells, used as a kettle for boiling water. Dried gourd-s

for holding fluids, are also called calabashes.

CALABASH. (See CERSCENTIA.)

CALABUM, Rall-ai'-di-um, in Bot., a gen. of plants belonging to the nat. ord. Araceæ. The species are mostly natives of South America and the West Indies, and are frequently cultivated as stove-plants in this country for the sake of their elegant spotted stems and neat leaves. They have the same general appearance ness leaves. They have the same general appearance as the species of Arum, and resemble them in being all more or less acrid. The species C. sequinum is highly poisonous, and when any part is chewed, the tongue swells so much that the power of speech is lost. On this account, it has received the popular name of dumb area. C. scalifications the Brazil achieva is dumb-cane. C. sagittifolium, the Brazil cabbage, is cultivated in many parts of the world for its leaves and root-stock, which, when boiled, are edible. The leaves are preferred, and are said to form a most nutritious and delicate vegetable. The corms of many other species, when cooked, are edible.

CALAMANDER-WOOD. (See DIOSPYROS.)

CALAMINE, kall-a-mine, native carbonate of zinc. (See ZINC.)

CALAMINE, ELECTRIC, a cilicate of zinc, found in various parts of America in rhombic prisms and in massive incrusted aggregations. On being heated, it possesses electric properties : whence its name. It is

an important ore of zinc. (See Zinc.)
Calamintha, kál-a-min'-tha (Gr. kalos, beautiful, mintha, mint), in Bot., a gen. of plants be-longing to the nat. ord. Labiatæ. Four species are natives of Britain, and are known respectively by the trivial names of mountain-balm, cat-mint, basil-balm, and wild basil. The first, which is also termed the common calamint (C. officinalis), has aromatic leaves, which are frequently employed by country people to make herb-tea, and as a pectoral medicine.

CALASTEES, kāž-ā-miles (Lat. calamus, a reed), in Geol., fossil stems occurring abundantly in the conmessures. They are hollow-jointed cylinders, with longitudinal furrows, and their flattened condition proves that they must have been so soft as to offer little resistance to pressure. The true affinities of the gigantic plants, of which these are the remains, have

not yet been determined.

CALAMUS, kal'-a-mus (Lat., from Gr. kalamos, a stalk, stem, or reed), a pen made from a reed, probably the stem of Arundo Donax, used by the ancients. The reed-pen, called Kalam by the Arabs, is still commonly

employed in Oriental countries.

CALAMUS, in Bot., a gen. of palms consisting of numerous species, all having very slender stems, which are found climbing over the trees in the forests of the hotter parts of the East Indies. Some of the best descriptions of walking causes are obtained from the plants of this genus. The Malacca cane is the produce of C. Zaluaca; Rattan cane, of C. scipionum and re-dentum; and Partridge cane, of an undetermined species. The fruit of C. Draco is the chief source of the natringent resinous substance known in commerce as dragon's blood. This completely covers the fruit, and is melted or scraped off, and then formed into small cakes.

mali cakes. Calamus Aromaticus, *d-ro-māt'-i-kus*, a name given by the accients to a plant generally supposed to be the sweet flag. (See Acceus.) Dr. Royle is, however, of

## Calcareous Waters

opinion that the name was applied to the sweet-torn grass which he has designated Andropogon calamins ations. (See ANDROPOGON.)

CALAMUS SCRIPTORIUS, scrip-to'-ri-us (Lat., a w ing-pea), in Anat., is a groove or canal with a pea-like termination at the bottom of the fourth ventricle of

the brain.

CALANDRA, kill-in's drd, a gen. of coleopterous insects closely allied to the Circulionide. The corn-west (C. granaria) is included in this genus. In its perfect form this little beetle is of a reddish-brown colour, sbout an eighth of an inch long; has a sleader snout slightly bent downwards, a closely-panetured and very long thorax, and furrowed wing-covers, that do not entirely cover the tip of the abdomen; It bores halving the paneture of the abdomen; It bores have the provided the provided with the provided ao not enturely cover the tip of the abdomen. It boxes a hole into the grain with its proboses, in which an egg is deposited. The egg turns into a tiny grub, which devours the whole inside of the grain, leaving the husk entire. Wheat and other grain may, therefore, be much damaged without presenting a had appearance. If the true state of the case, however, should be suspected, there is a very simple test. A handful of the suspected grain is thrown into a pan of water. of the suspected grain is thrown into a pan of water, when the hollow husks at once float on the surface, and the sound grains sink to the bottom. It will afford some idea of the formidable character of these tiny beetles, to state as an ascertained fact, that one female is capable of producing six thousand of her kind in a single year.

Calappa, or Box-cran, käi-läp'-pü, a gen. of Crus-facea inhabiting the sens of the Indian Archipelage, the Pacific and Atlantic oceans, and the sens of South America. One of this family (Calappa granulata) is an inhabitant of the Mediterranean, and, according to Prisse, is found most frequently in the fissures of rocks. at a depth sometimes of a thousand feet. Their general colour is pale rose, with whitish feet and brown

nails.

CALASH, käl-äsh' (Fr. calèche), a small low-wheeled carriage or chariot, employed for taking exercise in parks, gardens, &c. It is generally provided with a hood, or covering, which can be raised or drawn down at the pleasure of the occupant. The term calsah is also given to a head-covering used by ladies.

CALATRUS, kall-al-lines, a gen. of coleopterous insects belonging to the Geodephaya section. Upwards of twenty of this species of ground-beetle are found in

Europe.

CALATRAVA, ORDER OF, käl-ä-tra'-vä, an order of knighthood founded by the Abbe Raymond, after the knighthood founded by the Abbé Raymond, after the rules of the Cistercians, in 1158, when Sancho III., king of Castile, transferred to him the city of Calatrava. In 1163, the knights, under Don Garcias de Heddi, separated themselves from the monks, and were afterwards confirmed by the pope. In 1197, Calatrava was taken by the Moors, and the knights transferred their seat to the castle of Salvatierra, and called themselves after it. After the death of their twenty-ninth grand master, De Padilla, 1486, the choice fell several times upon the king, and in 1523 the pope made the office of grand master hereditary to the crown, and allowed the knights to marry. Though long one of the most honourable and distinguished of the orders in Spain, they never attained to great wealth, but they were possessed of great influence in the state. The order has lost most of its possessions, and, at present, is little more than an order of rank. The robe of the order is a white mantle with a red The robe of the order is a white mantle with a red cross of lilies on the left breast.

CALCAIRE-GROSSIEE, kul-kuire gros'-se-ai (Fr., coarse limestone), in Gool, an important member of the Eccane group of beds in the Paris basin, usually co-ordinated with the Barton, Bagahot, and Bracklesham

beds of England.

Calcarre-Silicieux, sil-e'-se-u(r) (Fr., flinty lime-stone), in Geol., a compact silicious limestone, which sometimes takes the place of the Calcaire-grossier in the Paris basin.

Paris basin.
CALCARBOUS SPAR. (See CALCITE.)
CALCARBOUS TUFA, kāl-kai'-ri-us-tu'-fa.—Calcareous
tufa is formed in volcanic districts by the deposition of
calcareous matter in a most or less compact form.
CALCARBOUS WATERS.—Carbonate of lime dissolves in pure water to the extent of two or those
grains to the gallon; but when carbonic acid is pre-

sent, it is much more freely taken up. If, however, the temperature be raised, the carbonic acid escapes, leaving behind a crystalline deposit of carbonate of lime. In nature, snormous crystalline concretions of this kind are formed by water charged with carbonic soid percolating calcareous strata. The stalactite carerus of Derbyshire are instances of this Kindare for Derbyshire are instances of this carbonic soid and carbonate of lime dripping from the roof, and leaving behind a portion of carbonate of lime before it drops. When it falls on the floor of the swars, another deposition of calcareous matter takes places, forming a statagmite, which gradually rises to meet the stalactite above it; in this way a natural pillar is formed. Most spring water contains carbonate of lime held in solution, which is deposited on the sides of the vessel when the carbonic acid is expelled by heat. In steam boilers this becomes a great inconvenience, and is obviated by adding sal-ammoniae to the water. Chloride of calcium is formed, which remains dissolved, while the carbonate of ammonia is volatilized with the steam. Water containing carbonate of lime in solution, or hard water, as it is popularly termed, is therefore softened by means of boiling. Hard water precipitates soap as stearate and margarate fines, forming the well-known curdy precipitate. Until the whole of the lime is thrown down, no lather can be formed; hard water is, therefore, very uneconomical for washing purposes. Dr. T. Clark has derised a very ingenious method of softening hard water, by adding milk of lime. The carbonic acid mites with the lime, setting free the carbonate originally dissolved, and the whole falls to the bottom as a precipitate of carbonate of lime.

CALCEDONY, or CHALCEDONY, kāl-sed'-o-ne (from Calcedon, in Bithynia), a translucent massive variety of quartz, closely allied to opal and agate, and often found associated with them. It often occurs in cavities in amygdaloid and other rocks, in the form of "icicles," or stalactites. The colours vary from white to yellowish brown, pale grey, bluish grey, and light

CALCECLA, kill-se-o'-Li (Lat., a little shoe), in Gool., a fossil brachiopod, so called from its under valve, which is shaped like the point of a shoe, and fitted with a lid-like upper valve. It is characteristic of the middle Devonian period.

CLECOLARIA. kāl-se-o-lai'-re-ii (Lat. calceola, a little shoe), in Bot., a gen. of herbaceous or shrubby plants belonging to the nat. ord. Scrophulariacez, and distinguished by the following cheracters:—Calvx 4-partite; oorolla 2-lipped, the lower lip being inflated so as to form a bag, and the shape of the whole, in some species, resembling that of a slipper; fruit a capsule, semi-bivalular, with bifid valves; only two fertile stamens. The species are natives of South America and the Falkland Islands. In Chili and Peru they occur in auch shundance as to give a peculiar aspect to the landscape. Most of them have corymbs of showy flowers, generally yellow, but sometimes purple. Calceolarias have been extensively cultivated in Europe as greenhouse plants since about 1830, and by crossing the species some lovely hybrids have been produced. Some of the species are used in South America for

OLICIES, kill-sine' (Lat. calx, lime), a chemical term, signifying the separation of the more volatile portions of a solid body by means of heat. Thus lime is formed from chalk or limestone by calcination. The older chemists applied the term to the oxidation of metals by heat, thinking it was an analogous process to that just mentioned; they therefore called alloxides produced by heat, calx, or calces of the metal; thus, calx of tin is what is now called oxide of tin.

CALCINITES, kall-sin-ites, compact calcareous ingrigistations formed in the open air. A section shows layers and lines of varying colour and hardness, which mark the gradual progress of the deposit.

CALOTTE, CALOAREOUS STAR, or CARBONATE OF LINE, till-site, institue crystallized carbonate of lime, commrsing under nearly 600 different crystalline forms, all derived from the fundamental rhombohedron. The purest crystals are transparent and colouriess; other varieties are semi-transparent and opaque, often co-domed with grey, red, yellow, rose, and violet. One

transparent form occurring in rhombuhedral drystals possesses the property of double refraction; i.e., chjects seen through it appear double. From having been found in Iceland, it is called Iceland Spar (which

CALCIUM, half-se-um (symbol Ca, equivalent 20, spec-grav. 1-55), the metallic base of the alkaline earth lime. Calcium belongs to the second group of metals, and has for its analogues barium, stroutium, and mag-nesium (which see). It is one of the most abundant nesium (which see). It is one of the most abundant substances in nature, forming a very large portion of the crust of the earth. It occurs in nature in combination with fluorine as fluor spar, with oxygen and carbonic acid as chalk, limestone, and marble, and with oxygen and sulphuric acid as gypsum, which is hydrated sulphate of lime. Calcium was first obtained by Sir Humphrey Davy by electrolysis, in 1808; but little Sir Humphrey Davy by electrolysis, in 1803; but little was known of its properties until Dr. Matthiesea formed it by the electrolytic decomposition of a mixture of the chlorides of calcium and strontisms. It is a light-yellow metal, of the colour of gold alloyed with silver; it is rather harder than lead. It melts at a red heat, and is very mulleable. It tarrishes in a day a trace again the red in melts at a red heat, and is very mulleable. It tarrishes in a day a trace again to day in meister. nishes in a day or two even in dry air, and in moister air it becomes slowly oxidized. It burns with a brilliant white light when heated in air, chlorine, or the vapours of iodine, bromine, and sulphur, and rapidly decomposes even at ordinary temperatures. It has also been obtained by MM. Liès-Boudart and Jobin by acting on iodide of calcium with sodium. The best-known compound of calcium is its oxide, or lime, which may be obtained in a state of perfect purity by heating pure carbonate of lime to redness. In practice, lime is made by burning common limestone with alternate layers of coal in a kiln. Lime is a white, porous, opaque, inodorous, infusible substance, with strong alkaline and caustre properties. When water is thrown on it, an equivalent is absorbed, and heat evolved, hydrate of lime (CaOHO) being the result. Hydrate of lime is commonly called slaked, or slacked lime, to distinguish it from anhydrous oxide, which is known by the name of quick lime, from its powerful caustic properties. Cold water dissolves about vio of its weight of hydrate of lime, forming lime-water. Contrary to the usual rule of solutions, hot water only contrary to the usual rule of solutions, hot water only dissolves about half that quantity. In fact, when lime-water, prepared in the cold, is heated, it deposits crystals, which redissolve as the solution cools. Limewater is alkaline to the taste, and turns vegetable yellows brown, and blues green. Exposed to the air, it gradually absorbs carbonic acid, and deposits carbonate for the Advances. bonate of lime. Milk of lime is bydrate of lime mixed with water until a milky fluid is obtained. Lime is greatly used in the arts for mortar, cement, and manure, for dyeing, soap-making, and leather-dressing. Mortar is prepared by mixing one part of freship slaked lime and two or three parts of sand, with suffleient water to form them into a paste. The theory of the hardening of mortar is but imperfectly understood, the most prevailing idea being, that a combina-tion of silicate of lime and a compound of the carbonate with the hydrate are formed, which, together, set in a solid mass. Hydraulic mortars, or cements, are such as set under water. They are made from natural or artificial mixtures of silics, or some earthy silicate, and lime. They are prepared by calcining a limestone and lime. They are prepared by calcining a limeatone containing these ingredients. A double silicate of lime and magnesis is formed, which has the property of absorbing water, and becoming insoluble. (For the theory of the action of lime as a manure, see MANURE.) Hydrate of lime is used in the purification of gas, in the preparation of summonia and bleaching-powder, in candle-making, soap-boiling, cotton-printing, tanning, and sugar-refluing. In the laboratory, hydrate of lime is extremely useful in preparing caustic alkalies, and in absorbing carbonic scid, for which it possesses a very strong affinity. In medicine, lime-water is used as an antacid, and to afford a supply of lime to the bones of rickety children who have not the power of assimilisting rickety children who have not the power of assimilating sufficient lime from their ordinary food to give the necessary compactness to their bones. The principal lime (CaCCo<sub>3</sub>).—This substance enters largely into the composition of rocks and minerals. In the smorphous state, it occurs abundantly under the well-known form

# Calcium, Chloride of

of limestone, colite, chalk, and mar!. It also forms the larger portion of corals, the bones of animals, the egg-shells of birds, the scales of fishes, and the shells of mollusks. In minute granular crystals, combined with various metallic oxides or bituminous matter, it constivarious metable of different sorts. White Carrars marble is nearly chemical, pure carbonate of lime. In a regular crystalline state, it occurs under a greater variety of forms than any other mineral. Its primary form is a rhombohedron, as in Iceland spar; but in arragonite it forms hexagonal and square prisms. (For a more particular description of these forms see Calcurs and ICELAND SPAR.) The uses of carbonate of lime are very numerous, under the forms of limestone and colite, which constitute building stone, marble, chalk, lithographic stone, &c. &c. When burnt with access of air, limestone forms ordinary lime; if, however, the air be excluded, and the heat raised to a considerable height, it fuses without undergoing decomposition, and, on cooling, forms a crystalline mass resembling marble. Chloride of line is the name given to bleaching-powder, which is prepared by passing a current of chlorine through milk of lime, by which means it is obtained insolution; or by passing chlorine over hydrate of lime, which produces it in the form of a moist powder. The product obtained is regarded by chemists as a mixture of chloride of calcium (CaCl) and hypochlorite of lime (CaO.ClO). By exposure to the air, hypochlorous acid is continually evolved by the action of the carbonio acid. If an excess of any acid is added, chlorine is produced. The former property is taken advantage of to destroy the gaseous poisons with which the air of sick-rooms and other localities is contaminated. By the action of the carbonic said of the sir, or by the addition of small portions of dilute sulpharic acid, hypochlorous acid is evolved, which oxidizes and destroys the miasmata. A mistaken notion has arisen that it is the chlorine that acts in this case; but, from the rationale given above, it will be seen that it is the oxygen of the hypochlorous acid which is the destroying agent. When chlorine is required for bleaching purposes, an excess of acid is used. (See BLEAGHING.) Chloride of lime is often used in the laboratory in conjunction with a weak acid as an oxidizing agent. Some chemists look on chloride of lime as being an oxychloride of calcium, or CaOCI, and deny that the compound contains chloride of calcium in an uncombined state, as none is dissolved out when chloride of lime is mixed with alcohol. Phosphates of lime.—There are several phosphates of lime, the most important of which is that obtained from the incineration of bones, which may be regarded as a triphosphate of lime. Superphosphate of lime, much used as a manure, is prepared by gradually mixing bone-dust with oil of vitriol, and adding an equal quantity of water between each addition of The mass is allowed to lie in a heap until it is dry, and is then used under the name of superphosphate of lime. Its real composition is found to be a mixture of time. Its real composition is found to be a mixture of phosphate and sulphate of lime with the animal matter of bones. Sulphate of lime occurs in nature as gypsum, selenite, and anhydrate. Gypsum, on being burnt, vields a white powder, commonly known as plaster of Paris, then is anydrous authorite of lime, possesses the property of soliditying when mixed with water: it also expands alightly at the same time. These properties render it extremely valuable for custing and moulding objects of which copies are required. Plaster of Paris absorbs water from the air if allowed to remain in unclosed water from the air if allowed to remain in unclosed (See Gyrsum and Stucco.) Sulphate of Hime is prepared by passing sulphurous acid through water containing chalk or hydrate of lime in a fine state of division. It is used as a convenient source of

CALCIUM, CHLORIDE OF (CaCI).—Chloride of calcium may be obtained from the residue remaining in the retort, after the preparation of ammonia, by adding to it a slight excess of hydrochloric acid and evaporating. On cooling the solution deposits crystals containing six atoms of water of crystallization. These crystals, which are six-sided prisms, are highly deliquescent. By fusing at a heat not exceeding 3/12° Fabr., four aquivalents of water are expelled, and the remaining white porous mass is extremely useful in the labora-

sulphurous acid.

## Calculating Machines

tory for drying gases. Further fasion expels the whole of the water. Anhydrous chloride of calcluing, on being mixed with water, gives rise to a considerable cleration of temperature; while the crystallized of hydrated salt, mixed with anow or water, depresses the temperature to -82° Fahr. Chloride of calcium is found in nearly all mineral waters. Chloride of palcium absorbs ammoniacal gas to a considerable extent. producing a salt of the formula CaCl.4NH ...

CALCIUM, FLUORIDE OF (CAF).—Fluoride of calcium occurs somewhat abundantly in the mineral kingdom as fluor spar, which is generally associated with the ores of tin, lead, copper, and zinc. It is found in crystals, the primitive form of which is the cube. They are generally yellow or purple, and sometimes pale green, or even colourless. On being heated, they decustitute violently, and emit a peculiar bluish-green phosphorescent light, which is probably due to electricity. Fluoride of calcium is sparingly soluble in water. It is soluble to some extent in uitric and bydrochloric acids, from which ammonia precipitates it unchanged. Sulphuric acid decomposes it, forming sulphate of lime with the evolution of hydrofluoria acid. It is principally used in the laboratory for this latter purpose. It is also employed as a flux in coppersmelting.

smelting.

Calcium, Phosphide of (Ca<sub>2</sub>P).—Phosphorus and calcium unite to form this compound, which is interesting as the source of the phosphides of hydrogen. It is prepared by distilling phosphorus over lime heated to low redness, a mixture of phosphide of lime and phosphate of calcium being the result. Phosphide of calcium is a dull red substance, hard enough to strike fire with steel. When powdered and exposed to the air, it slacks, emitting phosphuretted hydrogen. In its unslacked form, it is decomposed when thrown into water, phosphuretted hydrogen being evolved, which ignites spontaneously. ignites spontaneously.

CALCIUM, SULPHIDES OF. There are several com-pounds of calcium with sulphur, the principal of which are the protosulphide, which is known by the name of

Canton's phosphorus, and the pentasulphide.

Calcium, Teroxide of (CaO<sub>3</sub>).—This compound was procured by Thonard in brilliant crystalline plates. by adding lime-water to peroxide of hydrogen.

CALCULATING-MACHINES, kall-ku-lai-ting, machine by which all the common arithmetical operations and others of a more complex nature may be readily effected, thereby saving a considerable amount of time to those who are engaged in calculating long series of figures, and insuring results which cannot fail to be orrect. The system of logarithms (see Logaritms), invented by the celebrated Napier of Mcrchiston, in 1614, which is of the greatest assistance to mathematicians and others in the computation of figures, by shortening the ordinary operations, seems to have been instrumental in directing attention to the construction of an instrument by which arithmetical results could be produced by mechanical means, although the abacus (see Anacus) had been long used in Europe and Asia for effecting calculations; and Napier himself had produced what may be termed an elementary calculations. culating-machine, consisting of rods with four faces, known as Napier's Bones. (See NAPIER'S BONES.) The first instrument which can justly be called a calthe maximum which can justly operated a cat-culating machine was invented by Blaise Pascal, in 1642, when he was about nineteen years of age. It was more especially contrived for the calculation of sums of money, although it would also perform the ordinary operations of arithmetic with numbers on the common or decimal scale of notation. It consisted of a set of cylinders, with numbers marked on their external surface, moving on axles to which wheels were attached, with a certain number of notches cut in their circumference. As it is a matter of extreme difficulty to understand the construction and operation of a conplex calculating-machine from description only, it has been thought better to render the manner in which Pascal's machine was made, and the method by which it was worked, as clear as possible to the reader, merely mentioning the machines of other inventors, with a brief account of their general principles and purpose. Pascal's machine consists, as has been said, of a number of cylinders of the same size, with figures on the circumference, arranged in cortain

## Calculating Machines

series, as in fig. 1. In these figures, for the sake of exhibiting the whole of the numbers, the circumferences of the cylinders are represented as bands the extremities of which would join each other is the extremuses of which would join each other in brought into a circular form, at ax, yy, &c. It will be seen that the cylinder next the right hand of the reader is divided into twelve equal parts, equivalent to the number of pence in a shilling; the second into twenty parts, the number of shillings in a pound; while those towards the left hand, in succession, are divided into ten parts, corresponding to the nine figures and cipher used in our common system of notation.
With the cylinders last named, if there be a sufficient
number of them, the operations of addition and subtraction in abstract numbers can be readily performed,

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# Calculating Machines

its circumference, one with twenty notches on the axie of the next, and wheels with ten notches on the axies of the remaining cylinders. These wheels are turned by hand with a small rod of metal, one end of which can be easily inserted in the notches, to pull the wheels for-wards, and each wheel acts on the one next to it, from right to left, by a mechanical arrangement, so that while the first wheel moves round once, the second moves onwards a twelfth part of its circumference; while the second moves round once, the third moves onwards a twentieth part of its circumference; and while each of the others completes an entire revolution, the one next to it, to the left, moves onwards a teach part of its circumference, for reasons that are sufficiently obvious, or which, at all events, will be clearly seen presently. It should also be mentioned, that in fig. 1 the whoels are placed, with the ciphers of each series in a line in front of the machine, ready to commence operations. The double lines merely represent the front of the machine, to which the requisite line of figures must be brought when it is desired to make any calculations, and against which the results should appear, to be conveniently read. For the sake of illustration, suppose it is desired to add £5. 13s. 2d. to £9. 14s. 11d. We must first turn the wheels by the metal rod, in the direction shown by the arrow, until the figures 0, 14, 11, appear in the front of the machine, as in columns  $x_2, y_3, x_4$  in fig. 2; the figures in column rr remaining unaltered. It will be noticed, that by the change of position from fig. 1 to fig. 2, the space now in front of the cylinder xx in fig. 2 has been moved onwards eleven divisions from its original position in fig. 1, in the direction indicated by the arrow. We must now move it forwards two spaces in the same direction, as we have to add 2 to 11; we then have 1 in the lower part of the space now in front, as in Bg 3, which indicates 1s. 1d., as the cylinder has moved forwards thirteen spaces, or a complete revolution and one space (representing a shilling and a penny) from its original position in fig. 1. But while the cylinder x x moves through one revolution, the wheelwork connecting it with the cylinder y y, causes that cylinder to move onwards  $x_0^{i,j}(t)$  part of its circumference, and the figure 15 appears instead of 14 (or would appear if figures were given, showing the successive action of each cylinder on that next it to the left, which the reader can easily construct for himself), which shows that Is, has been curried, as it were, to 11; and we have now to add 13 to 15 for the shillings, instead of 13 to 14. The cylinder y y must, therefore, be moved onwards in the same direction as before for thirteen spaces. which brings S in the lower part of the space in from: of the machine, indicating £1. Ss. as the result of the addition, as the cylinder yy has moved forward twenty-eight spaces, or one revolution, and eight spaces, from its original position in fig. 1. The cylinder  $xx_1$  from the action of the wheelwork connecting it with yy, has moved forward one space during the complete revolution of y y, bringing 0 in the lower part of the space now in front of the machine instead of 9, showing that £1 has been carried to the original £9, and indicating that the £5 to be added must be added to £10. The cylinder z z is, therefore, moved forward five spaces, which brings 5 in the lower part of the space now in front of the machine, and by the connecting wheelwork between the cylinders zz, rr, the latter is moved forwards one space from its original position in fig. 1, in consequence of xx having performed a complete revolution, giving the reading £15. 8s. 1d. as the result, as shown in fig. 3. It will be noticed that the lower figures in the spaces are the figures used in the operation of addition; the upper figures are used to perform subtraction. From the above process the general principles of calculating-machines will be un derstood, and it will be readily seen how machines of a simple nature can be constructed to perform opera-tions in compound addition and subtraction for any system of weights and measures. Machines of a more rsys rsys rsys rsys rsys complicated nature, that would require pages of a more complicated nature, that would require pages of a acription to make their construction and principles even faintly comprehended, have been invented by Thomas of Colmar, Staffel, Wertheimer, Barmowskir, and pence, can be added and subtracted. It should be remarked, that a wheel is attached to the axle of the cylinder on the right, having twelve notches in 388.

Calculus

Colendar

by him the Difference Machine and the Analytical Machine, are the most extraordinary. The former is yet causing, are sig most extraordinary. The former is yet incomplete, and is deposited in the museum of King's College, London. It was invented in 1822, or, rather, Mr. Babbage had then conceived the primary idea of the machine. Government assisted Mr. Babbage to carry out his invention by grants amounting to £17,000; but covernment aid was ultimately withdrawn in carragovernment sid was ultimately withdrawn in conse-quence of some quarrel between Mr. Babbage and the authorities, and the machine was thrown on one side. authorities, and the machine was thrown on one side.
It was intended to connect a printing or stamping apparatus with the machine, by which it would have registered the results obtained on copper plates. Had this invaluable machine been finished, it would have performed any operation in arithmetic and algebra, and complex processes of differentiation and integra-tion. The withdrawal of the government grant did not deter Mr. Balbage from prosecuting his plans, and he was an exhibitor of his inventions in the Indus trial Exhibition of 1862. The invention of the brothers Scheutz was based on the description of Mr. Bubbage's Schentz was based on the description of Mr. Babbage's Difference Machine, and is similar to it in general principles, though it differs from it in some points in the method adopted in its construction. It was purchased by Mr. Rathbone, a merchant of Albany, U.S., for £1,000, and presented by him to the Dudley Observatory in that town. Messrs. Schoutz have since completed a machine for the British government.— Ref. Edinburgh Review, July, 1854; English Cyclopæ-

CALCULUS, käll-ku-lus (Lat., dim. from calx, a lime-stone), in Med., is a hard inorganic concretion formed in various parts of the animal body, and bearing a in various perts of the animal cody, and pearing a general resemblance in form or composition to stone. It receives various names, from the parts in which it exists; its, salivary in the salivary glands and ducts, pulmonary in the lungs, intestinal in the stomach or intestinal canal, bilitary in the gall-bladder, surioury in the bidder, suriously in the interior. the kidneys or bladder, gouty in the joints of gouty persons. The most familiar instance of the formation persons. The most familiar instance of the formation of calculus is the tartar which is deposited from the saliva and mucus of the mouth upon the teeth. The term calculus is, however, most frequently applied to those concretions which are formed in the gall-bladder or biliary ducts, and those formed in the kidneys or bladder. Biliary calculi, or gall-stones, are composed almost entirely of cholesterine, with some colouring matter. They vary greatly in size and number, amounting sometimes to hundreds, and even, it is said, to thousands; but so long as they remain in the bladder they do not usually cause much uneasiness. It is when they pass into the canal by which the bile is conwhen they pass into the canal by which the bit is con-reyed to the duodenum, that they occasion great pain and derangement of the system. The pain occurs in parxysms, and is generally attended with shivering and vomiting. If the bile be wholly obstructed, jaun-dice comes on, and rapid emaciation succeeds. The disorder sometimes proves fatal, but generally the disorder sometimes proves ratio, our generacy are stones find their way, sooner or later, into the intestines, and the disturbance subsides. The best remedies are opium and hot applications over the seat of pain, or a warm ball. Urisany calcult, graved, or stone in the bladder, are concretions formed and existing in is the standar, are contentions formed and existing in the urinary passages. They generally originate in the kidneys, and afterwards pass down into the hiddeder, where they frequently attain a very large size: some have been found to attain a weight of 14 to 18 oz., and even more. While in the kidneys they are termed read catculi, and they sometimes remain there per-manently, and may even attain a considerable size without causing much inconvenience; but they may also produce inflatmation and abscess, and ultimately cause death. Generally, however, while yet of small size, they pass down the ureters into the bladder. Sometimes the passing is attended with symptoms similar to those occasioned by the passing of a gallsimilar to those occasioned by the passing of a gall-stone, and similar remedies are to be had recourse to. The calculus having passed into the bladder, is then termed a vesical calculus. At first it is attended with comparatively little pain; but unless removed or eva-cuated, it is sure to enlarge, and to give rise to one of the most dreadful diseases that are an afflict humanity. In the carlier stages much may be done to check the progress of this dangerous malady; but when the cal-culus is once formed, the only means by which it can

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be got rid of is an operation. The stone must eithe be withdrawn through the urethra by an instrument or it must be broken into fragments small enou to be veided with the urine, or it must be extrac by an incision. (See LITHOTRITT, LITHOTORY.)
different varieties of urinary calculus are thus ch by Dr. Wollaston, in the order of their frequency :-1. Uric acid; 2. oxalate of lime, called the mulberry calculus from its dark colour and rough surface; 3. ammoniace-magnesian phosphate, called also the trip phosphate; 4. phosphate of lime, or bone-earth cal-culus; 5. fusible calculus, a combination of the last two species, and so called from its fusibility under the blowpipe; 6, the mixed calculus, composed of several of the other kinds confusedly mixed; 7, wrate of smmonia; 8. carbonate of lime; 9. cystic exide; 10. xanthio exide. The three last are extremely rare many of the calculi, and, indeed, most of them, are not of one uniform composition, but consist of strates of two or three varieties, one forming a nucleus for the other deposits, and calculi thus formed receiving the name of alternating. Uric acid is more common as a nucleus than any other substance. Urinary calculus is more frequent in some districts than others, and locality likewise influences the species of the stone. It is particularly prevalent in Norwich, while there are other large towns in which it is searcely heard of. In some families it appears to be hereditary, and especially in those who are also subject to attacks of gout. cially in those who are also subject to attacks of gout. It is much more common among males than females; and soldiers and sailors are particularly free from it.

The predisposing causes of it, however, are still very imperfectly understood.

CALCULUS, in Math., is a term generally applied to signify any brunch of mathematics which may lead to signify any branch of mathematics which may lead to or involve calculation,—in fact, to all except pure geometry. There is the common Arithmetical calculus, and there is the Algebraic calculus. The invention of the Differential calculus and the Integral calculus is claimed for Leibnitz; they are identical with the Fluxionary calculus invented by Newton. The calculus of Partial Differences is a branch of the differential and integral calculus; and the calculus of Variations is another portion of the same theory. That part of Algebra which relates to exponents and logarithms is sometimes called the Ernonential calculus.

is sometimes called the Exponential calculus.

CALDARIUM. (See BATH.)
CALDARIUM. (See BATH.)
CALDHON, kawl'-dron (Fr. chauldron), a large kitchen
vessel, generally made of copper, having a movable
iron bandle, by which it can be suspended on a hook

above the fire.

CALEDONIA, kill-e-do'-ni-d, the name given by the Romans to that part of Scotland lying north of the firths of Clyde and Forth, which formed the northern boundars of the Roman province Britannia, as established by Agricola, who penetrated farthest in this direction. The derivation of the term is doubtful, but the root, caled, or caledon, is evidently British. With direction. The derivation of the term is doubtful, but the root, caled, or caledon, is evidently British. With later writers, Caledonia corresponds pretty nearly with the present limits of Scotland. The inhabitants are described as having red hair and large limbs; as living in tents, naked and barefooted; as fighting from chariots, with shields and short spears, and having daggers also. They belonged not to the Germanic but the Celtic race. the Celtic race.

CALEDONIES, kal-e'-do-nite (from Caledonia,

land), a compound of sulphate of lead with the car bonnies of copper and lead, found in long prismatic crystals, of a deep bluish-green colour, at the Lead-

hills mine, in Scotland.

CALEMBOUR, or CALEMBOURG, käll-em-boor, is a French expression for a pun, said to have been taken from a certain Westphalian, Count Calemberg, who visited Paris in the reign of Louis XV., and became notorious for his blunders in the language.

notorious for his blunders in the language.

CALENDAR, or KALENDAR, kall-en-der (Gr. kalein, to call), a written catalogue or table of all the days of the year, arranged in the order of days and weeks, to which are generally added certain astronomical indications, such as the hours of the rising and setting of the sun, the entrance of that star into each sign of the sodisc, the commencement of the seasons, the phases of the moon, as well as the particular epochs of religious and civil acts. The calendar being in reality but the and civil acts. The calendar being in reality but the chronological table of the year, has necessarily varied

with different peoples, according to the divers forms of their year. These different forms will be found ex-plained in the article Yuak. The most remarkable calen-darsare,—1. The Hebrew calendar. They car of the Jews was a lunar one, being composed of 354 days, divided into twelve months, which had alternately twenty-nine and thirty days. In order to make this lunar year accord and thirty days. In order to make this funity ear accord with the solar year, the Hebrews supplied, seven times in nineteen years, an intercalary month of twenty-nine days. Each month was divided into periods of seven days, or weeks, the Saturday being celebrated under the name of Sabbath.—2. The calendar of the Greeks, whose year was likewise lunar, and composed of twelve months in a paternately twenty-nine and thirty was the saturday of the calendar of the contraction and thirty was the saturday of the calendar of the contraction and thirty was the contraction of the calendar of th souths, containing alternately twenty-nine and thirty Greeks added every two years a supplementary month. Back month was divided into three decades.—3. The Roman, or Julian calendar. The Roman pear, under Roman, or Julian calendar. The Roman year, under Roman, however, the year was extended to whelve months, or 355 days; but, although nominally thus defined, the calendar did not in reslity fix anything more precise than the commencement of the months and extended to the months. and seasons; and through the ignorance or negligence of the priests, the utmost derangement subsequently To obviate this confusion, Julius Casar, arose. To obviate this confusion, Julius Casar, in 46 s.c., effected a reform, by the introduction of the Julian calendar, in which the length of the solar year was fixed at 365 days, to which was added, every four years, a day called bissextile. This calendar was adopted not only by the Romans but also by all the modern nations, and remained in use until the introduction of the calendar of Gregory XIII. The Roman year had twelve months, each being divided into unequal parts by the Calenda, Nones, and Idea (see these words).—4. The Gregorian calendar. This mode of distributing time was the result of the re-(see these words).—4. The Gregorian calendar. This mode of distributing time was the result of the reform inaugurated by Gregory XIII., and dist came into operation in October, 1552. This calendar principally differed from the preceding in deducting 10 days of that year, in which it first came into operation, it having been ascertained that the error fit in minutes of the Julian year had amounted, in 1632 years, to 10 whole days. In order to prevent a resurrence of this error, it was ordered that even a recurrence of this error, it was ordered that every year ending a century should not be counted as a leap-year, excepting the 400th year, and the multiples of 400. Thus, 1200 and 1600 were leap-years, 1810 was not, nor will be 1900: 2000, as being a multiple of 400, will be a leap-year, as well as every 400th year after-wards, in addition to every fourth year when it does not end a century. The Christian peoples, while they preserved the names and the order of the months of the Romans, rejected their manner of dividing the months and counting the days; adopting, instead, the Hebrew system of dividing the mouth into weeks. The Greeks and Russians have refused to adopt the Gregorian calendar, retaining the Julian, or what is called in this country the "old style." Hence it is necessary to deduct 12 days from the new style, in order to make it agree with the old. The reason for there being at the present time a difference of 12 instead of 10 days between the old and new modes of reckoning, is due, as Assaiready been explained, to the fact that, in the Gregorisu calendar, the years 1700 and 1800 were not counted as lesp-years, while, according to the old, or Julian mode, they were so estimated.—5. The French Republican calendar. This was adopted by a decree of Republican calendar. This was adopted by a decree of the National Convention of Oct. 1793. The year was therein divided into 12 months, of 30 days each, 5 com-plementary, or "sans-culottides" days, being added at the end of each year. The commencement of the year was fixed at midnight of the 22nd of September year was used at midlight of the same of opposite the autumnal equinox), and, retrospectively, the new year, or Year L of the Republic, began on the 22nd of September, 1792. Fresh names were given to the months being, and the days; the titles of the months being, for the autumn season, Vendémiaire, Brumaire, and Frimaire; for the winter season, Nivose, Pluviôse, and Ventôse; for the spring season, Germunal, Floréal, and Tenings; and for the summer season, Messidor, Ther-midor, and Frantidor. Each month was divided into a period of three decades (10 days each), each day bearing, instead of the name of a saint, that of an agricultural product, implement, or animal useful in

cultivating the earth. This calendar remained in a during thirteen years, and was abolished by a deer

turners years, and was abunated by a comment. the emperor Napoleon L, on the lat January, 1906.

CALENDARS, in Ecol. Hist., denoted certain books preserved in the churches, containing the memorials of the days on which the martyrs suffered. Afterwards confessors, and other distinguished Christians which had not noticed at the confessors. who had not arrived at the glory of martyrdom, were also admitted to this honour. The principal work of

who had not arrived at the glory of martyrdom, were also admitted to this honour. The principal work of this kind is Assemann's "Calendar of the Universal Church," illustrated with notes.

CALENDARUM FERSTUM, kål-en'-dil-rum fer-tum (Lat., Feast of the Calends), in Eccl. Hist., were heatheuish festivals celebrated on the calends of January, and afterwards adopted by the early Christians. They were observed in the churches with masks, and were attended with a business durating and group and gross independent. with singing, dancing, and gross indecencies. Fathers and councils long laboured in vain to put down these festivals; and Tertullian, Chrysostom, and Augustine have declaimed in the very strongest terms against them.

-Ref. Du Cange, Glossarium Latinitatis-Kalendes.
CAUENDARUM FRATERS (Lat., Bretiren of the Calends), a religious society, which originated about the 12th century, and took its name from the custom of assembling together in various places on the first day of each month to regulate the observance of the ensuing feasts, distribute alms, &c. It spread over France and Germany, but afterwards, having given rise to abuses, it was abolished.

CALENDERING, kill-en-der-ing (Fr. celendrer; Gr. kulindres, a cylinder, robler), the name given to the final process adopted to finish pieces of cotton, or linen, for the operations of the calico-printer, or for sale. It is done by passing the wobs between cylindres and the contract of ders subjected to enormous pressure, and the process directly derives its name from the cylinders that are used to smooth, or flatten, the cloth that is passed between them. When clothes have been washed, they between them. When clothes have been washed, the are subjected to a simple form of calendering passing them through a mangle, or by starching, and afterwards pressing them with the common smoothingiron. The patent mangle is somewhat similar to the machines at present used by manufacturers in the general principles of its construction; and the old mangle, in which clothes were pressed on rollers that moved backwards and forwards on a level surface under a heavy box filled with stones (see MANGLE), was identical with the old calendering machines, with this difference only, that they were larger and heavier, and When the French and turned by horse-power. Dutch Protestants were obliged to quit their respective countries on account of the severities pract against them, they introduced the cylindrical calcu-dering machine, in which the cloth is passed between cylinders, instead of between rollers and a flat surface as in the mangle, by which improvement every part of the piece receives a uniform pressure, and is passed through in one direction, from end to end, instead of being rolled backwards and forwards on rollers under a heavy traversing-box. The cylinders were formerly made of wood, but they are now made of paper and east iron, or copper, a cylinder of paper working against one of iron, which is found to be better than iron working against iron, as the paper cylinders combine some slight degree of elasticity with the extraordinary hardness they possess. These cylinders are made of discs, or plates, of thick pasteboard, with a hole in the centre to receive an iron axis, and others near the circumference, through which long iron bolts, with nuts and screws at either end, are passed. Iron plates are added at the ends of this cylinder of pasteboard disks, and the whole is tightly compressed by the action of the screws. The surface of the roller is rendered true by turning it in a lathe The iron cylinders which are used in conjunction with those of paper are hollow, and heated by the intro-duction of steam, or red-hot heaters. The calendering machine consists of four or five rollers placed in a strong framework, generally of cast iron, one above another. The pressure with which these rollers work against each other is regulated by levers. If smoothing only is required, the rollers are so regulated that their surfaces may travel with uniform velocity, although they may be of different sizes (that is to say, if two rollers were in juxtaposition, one of which was size

#### Calendars

inches in diameter and the other twelve, the smaller roller must revolve twice while the other is going round once, as the circumference of the larger one is equal to extent to twice that of the smaller); but if the is equal in extent to twice that of the smaller); but if the material is required to be glased, the rollers are so set that their surfaces may travel with different velocities, in order that the surface of one may fub against the surface of that next to it. When fabrics are calendered, they are first subjected to slight pressure between warm eginders. They are then prepared with starch, which is sometimes adulterated with plaster of Paris, to give an appearance of substance to the material and again passed through the machine. The round and agan passed through the machine. The round threads of which the web is composed are then found to be flatened, and the texture of the fabric rendered to be flatened, and the texture of the fabric rendered closer, which is the main object of calendaring. When the fabre is to be glazed, as chintz, for curtains and the cowrings of chairs and solas, very hot copper rollers we used, which rub as well as press against the paper chinders to produce the desired polish. Watered goods are made to present their peculiar appearance by passing them under a metal cylinder with a raised patern on it, which produces a greater pressure on some jarts of the cloth than on others. Lawns and muslins we only subjected to a light pressure, that is just sufficent to smooth the surface without flattening

small artices, or made-up goods with seams in them. CALENDER, käll-en-ders, a Mohammedan sect, which take their same from Santon Calendri, their founder. They preacl in the market-places, and live upon what their heares are pleased to bestow; but they are distinguished hore by free living than austerities, and

the thread Glazing was formerly effected by stretching the fabricon a table, and rubbing it with a polished flint, and his method is now sometimes adopted for

are held in litle esteem.

CALENDS, or KALENDS, kall-ends (Lat. calenda), in Roman chonology denoted the first days of every month, beingso named from culo, I call or proclaim, month, beingso named one cato, I can or procum, because then the priests proclaimed the number of fasts or sacred days to be observed in the month. The Romans evided their month into three periods,—the Calends, Nuce, and Ides. The calends always fell on the 1st of te month, the nones on the 5th, and the ides on the 13th, except in the months of March, May, July, and ctoher, when the nones fell on the 7th, and the ides on he 15th. The days of the month were then reckoned bekwards; thus the 30th of April was the day before the calends of May, or the second day of the calends, to 29th the second day before the calends, and so o to the 13th, when the ides com-menced, the 12th bing the day before the ides, and the 4th the day beforthe nones. As the Greeks did not reckon their days a this way, the Romans had a proverbial expression, of Gracas calendas (on the Greek calenda), meaning ever. The calenda were usually the time for settlin accounts, interests, &c.: hence they were sometime-railed triutes calenda. The book in which an account othe interest was kept was termed

CALERDULA, kil-en/lu-la, in Bot., the Marigold, a gen. of plants helonging to the nat. ord. Compositae, sub-ord. Tubiliforae. he species C. afficinalis is the common Marigold of English gardens, the Gold-blume of the Germans, the Shei du jardin of the French, and the Furrancio of te Italians. Formerly, many medicinal virtues were veribed to this plant, and its flowers were usually add to soups to colour them. and also to act as " comfolers of the heart and spirits." Baffron is frequently adultrated with the yellow florets Saffron is frequently admirated with the yellow librets of the marigold. The nale is stated to be derived from calendulas, the Latit for the first day of the month, there being flowertalmost any month in the year.

CALENTURE, kill-en-ture Lat. cales, I make hot) is a term derived from the Spanish, and applied to a violent ardent fever common mong sailors in very hot climates. It is so called either as being accompanied by a burning heat, or as resulting from the great heat

of the climate.

CALERIN, kill-e-pan(g)', a Fiench term, denoting a sollection of literary or scientific notes or information, a pockethook in which one inscribes his observations or reflections, or a lexicon. The word is derived from Calepino, a learned exicographer of the 15th century,

# Calico-Printing

who took his name from his native place, Cal Italy, and was the author of a celebrated dictionary, which subsequently passed through editions.

CALF, GOLDEN, kalf, in Sacred Hist., was an id set up and worshipped by the Israelites at the idset up and worshipped by the Israelities at the four of Mount Sinai, in their passage through the will derness to the land of Canann. The people faccylinit, from the long tarrying of Moses on the mount, that they were deprived of his future guidance, prevailed upon Aaron to fashion them a golden calf, that they might worship as they had seen done in Egypt, and for that purpose they contributed their ear-rings. This calf Moses is said to have burnt with the, reduced to reach a reach a travel it won water and started it was read and and a feel. to powder, and strewed it upon water, and made the children of Israel drink, the object of which probably was to testify his contempt for such gods, and to show their powerless they were to save themselves from destruction.

CALIBBE, kil'-e-ber (Fr. calibre), in Mil., the technical expression for the diameter of the bore of any kind of cannon, rifle, or fowling-piece. The capacity of mortars and other guns used for throwing holity shot and shells is usually expressed by nearing their calibre, as 10-inch howitzer, 13-inch mortar, &c.; while pieces of ordnance, from which solid shot are fired, are, on the contrary, spoken of in accordance with the weight of the shot they throw, as 12-pounder, 300-pounder, &c. The compasses, with enryed legs, used for taking the diameter of shot and shells and cylindrical bodies, are called calibre compasses, or,

improperly, callipers.

Caltoo, käll-e-ko, plain cotton cloth, which sonstitutes one of the most important British textile manufactures. It derives its name from the town of Calicut, in India, whence it was first imported. (See

COTTON MANUFACTURE.)

CALICO-PRINTING, the art of impressing cotton fabrics with arious figures in one or more colours. In describing this art, the term will be taken in its widest sense, as signifying printing on any fabric, whether cotton, woollen, or silk. There are few dyes which of themselves will impart to cotton a brilliant colour, able to resist the actions of light and washing. The dye must be combined with a substance called a mordant, which has an affinity both for the dailed a morcant, which has an aminty both loss are dye and the cotton fibre. These substances, although generally colourless, have the property of changing, the colour of the dye. Thus, if a piece of cotton cloth be impressed with acetate of alumina in lines, with acetate of iron in dots, and with a mixture of the two in circles, it will become permanently impressed with red lines, black dots, and chocolate circles. The pro-cess of printing in different colours by means of morcess of printing in different colours by means of mor-dants is very ancient, being described by Pliny as having been practised in his day in Egypt. In his Natural History he says: "Robes and veils are painted in Egypt in a wonderful way, being first im-bued, not with dyes, but with dye-absorbing drugs, by which they appear to be unaltered; but when plunged into a caldron of boiling dyestuff, it is curious to see many colours imparted to the robe, in consequence of the modifying agency of the excipient drug." In India, the modern method of printing by resist pastes has been known from time immemorial, the process fabric by hand with melted wax. Many of the speci-mens of Indian calico-printing by this method are most intricate in their design, and must have taken a lifetime to execute. Calico-printing was first introduced into England at the latter end of the 17th century, and met with furious opposition from the silk-weavers of Spitalfields, in whose favour the English government passed several acts prohibiting the importation of Indian calicoes, and exacting heavy penalties from any one making or wearing printed calicoes. In 1730, fabrics of cotton weft and linen warp were allowed to be printed and worn, by paying a duty of 6d. per square yard; and is was not until 1774 that cotton cloth was allowed to be was not until 1/74 that cotton cloth was allowed to be printed, on the payment of a heavy duty, which was only removed in 1831. The processes employed in calico-printing are,—Singeing, by which the cloth is dennded of its fibrous flown, which would prevent the perfect application of the dyestuff. It is effected in two ways; either by rapidly passing the cotton cloth-over a

red-hot iron, or by passing it over a series of gas flames, which are sucked through the fabric by suction-tubes placed over them. The fabric is next bleached by being boiled in an alkaline bye of sods or lime, rinsed attempted in a weak solution of chloride of lime, rinsed attempted in a weak solution of chloride of lime, rinsed steeped in a weak solution of chloride of time, rinsed, again, steeped in dilute sulphuric acid, once more rinsed, dried, and smoothed. The cloth is now ready for printing, being brilliantly white, and capable of receiving dyes of the brightest and purest colours. Calicosa are printed in four ways.—by small wooden blocks worked by hand, by large wooden blocks worked by-a machine, by copper plates, and by copper cylinders. The first and third methods are almost obsolete; the assumits avantisated principally on the continent; and the second a practised principally on the continent; and the fourth is, par excellence, the English method. In the large blocks mentioned in the second method the patseems are generally made of sycamore, laid upon deal, and either engraved in relief, or formed by copper slips, of different shapes, being driven into the surface. The machine used in this style is called a Perrotine, from the name of its inventor, M. Perrot, of Rouen. The cloth as wound round a prismatic iron roller, and the different so would round prismatic from round; and the different coloured blocks are brought down on it successively. By this feeces, one man and three children can print thirty pieces of cloth in a day. In the English process, the pattern is impressed upon copper cylinders by hard steel rollers called dyes. These cylinders are mounted upon strong iron shafts, upon the end of which is a toothed wheel, by means of which motion is communicated to them. Several of these engraved cylinders, one for each colour, are united in one machine, forming two, three, five, and even ten-colour machines. The cotton cloth is made into a continuous web of forty or fifty pieces, and is drawn over the rollers, each one re ceiving its colour from a cylinder covered with woollen cloth, and revolving in an oblong trough of colouring matter, mordant, or resist-paste, and transferring it to the cloth. Calico-printings have reached such a state of perfection, that they will print nearly ten miles of cloth per day, with a pattern containing four or five colours. Dyestnffs are of two kinds, those which impart their colour alone, and those which require the applitheir colour alone, and those which require the application of a mordant. The former are called substantive, the latter adjective. (See Dyring.) There are, principally, five styles of calico-printing.—1. The Fast-colour, or chintz style, in which the pattern is applied in the form of a mordant, the cloth being afterwards passed through a dye-bath. The colour, of course, ellings only to the mordanted portion, the rest being washed out in an after-process. 2. The Rongeous style, in which the pattern is worked upon the cloth by the appearance of some chemical substance which discharges appearance of some chemical substance which discharges egency of some chemical substance which discharges ertions of the uniform colour in which the cloth was irst printed. 3. The Resist-paste style, when the pat-tern is printed in some substance which resists the general dye afterwards applied to it, such as indigo, or some other substantive colour. 4. Steam colours, in which a the union of the two being effected by subjecting it to the action of steam. 5. Spirit colours, in which a mixture of dye and tin spirits, or chloride of tin, is used. Patterns printed in this style are very brilliant, but extremely fugitive. In the first style, the mordant used may be either acetate of alumina, or red liquor; acetate of iron, or iron liquor; or chloride of tin, or tin spirits.

The mordant is mixed with starch or British gum, and different shades of the same colour may be obtained by diluting it more or less. The principal dyes and in this style are logwood, Brazil-wood, peach-wood, Persian berries, archel, madder, cochineal, fustic, secod. Fersian berries, archel, madder, cochineal, fustic, estecsies, quereitron, and galls. (The different colours estecsies, quereitron, and galls. (The different colours british dyestams will be found fully described under DYRING.) In the rongeant, or discharge style, the discharge generally consists of some strong acid, such as strictle, oxalie, or tartaric acid, made into a paste with pipolary and gum, and applied either to the dyed or meridanted cioth. In the latter method, a new mortant may be applied along with the discharge, in which case a coloured pattern will be the result. For fundament, a violet cround with red lines and which astance, a violet ground, with red lines and white fastance, a violet ground, with red lines and white dots, may be produced by passing the cloth through weak is on liquor, and printing the lines with red liquor mordant. The dots are then printed with a distance paste of tartaric and oralic acid, and the whole

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is passed through a madder dye-vat. In the resist, or reserve style, various substances capable of resisting the action of substantive dyes are used; such as oil the action of substantive dyes are used; such as oils metallic oxides, and their salts; and reserves, containing mordants, are used, when a coloured impression is desired. The latter method of printing with mordant resists is called the lapis lands style, wherefore it is hard to say. Steam colours are mostly produced by the aid of peroxide of tin, of stantage acid, or perchloride of tin is used as a moriant. A full-bodied red, for instance, is produced in the following manner:—A decection of peach-wood is bickened with gum, and mixed with chloride of tin. Thi impress sion is printed on the cloth with this mixture, and, when dry, the goods are submitted to the action of dy steam, which causes the union of the substances dutained in the dyestuff. Spirit colours are brilliant put very fugitive. They are mostly vegetable dyes, mad with perchloride of tin, or tin spirits, as it is termed A sixth style—Pigment printing—is when a heavy, insoluble colour, such as ultramarine or magenta, is mxed with gutta-perchasolution, albumen, or caseine, art printed on the cloth. Since the introduction of the adine dyes, this method of printing has somewhat reved. By the combination of superexcellence in maginery and chemistry, England is now at the head of the calico-printing trade; the exports reaching, it 1857, 808 millions of yards; but it will be long before she will succeed in rivalling the exquisite printed muslins of the French manufacturer. Though taking the lead in the French manufacturer. Though taking the lead in machinery and chemistry, we are very far behind in the artistic portion of the trade; the string combinations of twenty colours of Manchester contrasting very unfavourably with the artistically lended hues the commonest productions of Milhouse and Paris.

CALIF, CALIFH, or KALIF, kai lift Arab, lieutenant or vice-gerent), the title assumed by the successors of Mohammed in the supreme ower. It was first adopted by Abu Bekr, his immedate successor, and continued for a number of centuris to be the title of the principal line of sovereigns. The term califate was employed to designate the empireunder the sway of the califs. After the death of Mohammed, his successors extended their empire so astly, that, 100 years after his flight from Mecca, the bounds of the califate extended from India to the Alantic Ocean, in-cluding Persia, Syria, Egypt, and pain. "The lan-guage and laws of the Koran were tudied with equal ction at Samarcand and Seville : the Moor and the Indian embraced as countrymen ad brothers in the pilgrimage to Meeca; and the Arbian language was adopted as the popular idiom in it the provinces to the westward of the Tigris."—(Gibon.) At this time, the calfs were the most potent ad absolute monarche of the globe. They united in hemselves both the regal and sacerdotal character; their prerogative was not circumscribed, either irright or in fact; and if the Koran was the rule of teir actions, they were the supreme judges and interreters of that divine book. The empire reached is greatest power and splendour during the latter art of the 8th and the beginning of the 9th century of our era, under the culifs Mansur, Harun-al-Rasid, and Mamun. Even then, however, the empirewas beginning to show symptoms of decay, and, eder Mamun's successor, Mostasem, Turkish soldier were employed for the first time in the army. Inder his successors, these came to be a formidable pwer in the empire, and at tength assumed the right c deciding the succession to the throne. Independently assume sprung up in different parts of the empire and even within the capital and provinces that contined faithful, the authority of and provinces that contined faithful, the authority of the calif was little more aan nominal. In 1258, "after a siege of two months, Bgdad, the capital, was stormed and sacked by the Moguland their savage commander pronounced the death of the calipla Mostsaem, the last of the temporal successors of Mohammed, whose noble kinsmen of the race of shoas had reigned in Asia shore 500 years."—Gibbon.) The nephew of the murdered Mostasem fled to Egyp, where he retained the title of calif, under the protection of the Mamelnikes, and be-quenthed the honour to dis successors. When the quenthed the honour to his auccessors. When the Turks conquered Egypt, in 1517, we last of the nominal califs was carried to Constantinple, and since that

Calign

time the Purkish sultans have assumed the title of calif, and claimed to be regarded as the spiritual head of the Moslems

Of the Robisma.

Callen, kall-o-js, is a term derived from the
Latin caliga, a kind of shoe, or rather half-boot, worn
by the Roman soldier; and hence, in the early ages of
the Church, it was applied to a similar article of dress,
which found part of the insignis of a bishop, and was
emblematical of the spiritual warfare upon which he

Calife, kal-e-go (Lat., darkness), is a term employed In Med. to denote dimness or obscurity of vision; and hence it terms part of the name of various diseases of the eye attended with dimness or loss of sight; as caligo comos, lentis, humorum, &c. (See BLINDNESS, EYE.)

CALLGRAPHY, kul-ig-ruf-e (Gr. kalos, beautiful, graphs, writing), is the art of beautiful writing. Previous to the invention of printing, this art was greatly fostered, and many admirable specimens of it still exist. Some of them are written in letters of gold, vermilion, &c., on leaves of various colours, and richly ornamental with beautiful devices. The scribes who were employed in thus copying MSS, were termed caligraphes.

CALIPPIC PERIOD, or CYCLE, kil-ip'-ik, in Chron., receives its name from an Athenian astronomer, Calippus, by shom it was first observed, about B.C. 330. About a concury before, it had been discovered by Meton, that in nineteen years there are 235 lunations, when the nev and full moons return to nearly the same day and hour Calippus observed that this would be more nearly the case by taking four Metonic evcles or periods of nileteen years, and then subtracting one day. The Cuippic period is thus 70 years, less one

CALISTHENIUS, kal-is-then'-iks (Gr. kalos, beautiful sthenes, strength), the science or practice of exercising the limbs and body for the purpose of strengthening the muscles and acquiring a more graceful carriage. (See GYMNASTICE.)

CALITRICHACEE, kul-it-ri-kai'-se-e (Gr. kalos, beautiful, fhrix, mir), in Bot., the Starwort family a nat. ord. of heotylethologus plants, in the subolass Monochlamylea. olsas Monochlumyles. The species are small squa-tic herbs, having the following general characters: Leaves opposite, entire, simple; flowers minute, axillary, solitary, wisexual, schlamydeous; the male flower of 1-2 stamens, with reniform anthers, the female flower having a 4-cornered, 4-celled overy, with one suspended vule in each cell; fruit indehis cent, 4-celled; seeds 1, pellate, with fleshy albumen; embryo inverted, with a very long superior radicle. Calitriche is the only jenus, and includes six species, natires of fresh-waterpools in Europe and North

America. Their uses at unknown.

CALIVER, kul-1-ver, a land-gun in common use about 1600, that could be discharged from the shoulder with-

1600, that could be discharged from the shoulder without a rest. It was fired b' means of a matchlock. The barrel was shorter than hat of the old musket, and much lighter, and the dispeter of its bore was made according to a fixed standed; hence the name of the weapon, corrupted from calore. (See Calibre.)

Calixines, kd'-iks-tines Lat. calix, a cup), a Bohemian sect which sprung upamong the Hussites, and received their name from holding that the communionup should be given to the lay as well as the clergy. Their confession of faith, draw up in 1421, contained the following articles:—1. The Vord of God should be freely, and without hindrance, regularly preached by the following arrange.—In the voru of troat should be freely, and without hindrance, egularly preached by the priests of the Lord, throughout Bohemin; 2. the sacrament of the holy communion the wine as well as the bread, should be freely adminitered to all Christthe breat, should be rown saturatered to an enrist-ians burdened by no mortal sins, scording to Christ's institution; 3, the clergy should be separated from secular affairs, and should conform hemselves to the life and teaching of the aposities; \ that all mortal sins, and especially such as are of a public nature, as sins, and especially such as are on whithin enture, as simony, unchastity, and the like, and a Jothers that are contrary to the law of God, should bindged of and numished by those having authority oversuch matters. They were the more moderate of the followers of John Huss, being opposed to the more extrac sect of the Taborites. They subsequently became the dominant party in Bohemia, and exercised constrable inCali

nuence over public affairs. From the beginning of 16th century, however, they gradually lost their portance, and came to share in the fate of the E testants generally in Bohemia. (See BOHEMEAN HITRER.)

CALIXITIES, were also the followers of George Calixius, a celebrated Protestant divine of the 178 century, who endeavoured to unite the Romish, Lu theran, and Calvinistic churches in the bonds of ol and mutual benevolence. He maintained that the fun damental doctrines of Christianity—by which he mean those elementary principles whence all truths flow-were preserved pure in all three communions, and were contained in the Apostles Creed; and that the tenets and opinions that had been constantly received by the ancient doctors during the first five centuries, were to be held as of equal weight and authority with the express declarations and doctrines of Boripture

Cali Yuca, ka'-le yu'-ga, a Hindu era, taken by the Brahmins as the commencement of the present age of the world, called by them the "iron age." It dates the world, called by them the "tron age." It cause from 3102 s.c., the period of the Deluge. The year 1862 is the year 4964 of the Call Yuga era; thesefore, to bring any date of the Call Yuga era to its corresponding date according to the Christian era, we must subtract 3102 from it. The year, according to this era, com-3102 from. it.

mences in April. CALEING, kawk'-ing, in Mar., a term signifying the act of forcing a quantity of oakum into the seams between the planks of a ship's decks or eides, by means of iron chisels, called calking-irons. When the cakum has been driven firmly into these seams, it is covered

with a coating of pitch or rosin, to prevent its rotting.

CALL, kawl, is a term used in Theology in a variety of significations. In a general sense, it denotes God's invitation to man to never to f the offer of salvation. Effectual calling is said to be "the work of God's Spirit, whereby, convincing us of our sin and misery, en-lightening our minds with the knowledge of Christ, and renewing our wills, he doth persuade, and enable us to embrace Jesus Christ, freely offered to us in the governel." Call to the ministry, is said to be twofold; either outward, when one is judged qualified to hold office in the church, and is admitted thereto in due form; and inward, when one is inwardly moved thereto by the Holy Spirit. This inward call should precede, and is required as a qualification for the outward. didate for deacon's orders, in the Church of England, is asked, "Do you trust that you are inwardly moved by the Holy Ghost to take upon you this office and ministration to serve God, in promoting his glory, and the edifying of his people?" According to Dr. Hook, the meaning of this question is, "whether, after an im-partial examination of their hearts, they find that they do not take this sacred employment upon them, barely for a maintenance in the world, or that thereby they for a maintenance in the world, or that thereby they may acquire those superior dignities and profits which, in these penceable ages of Christianity, some of the clerky do partake of, but only that they think they may be serviceable in God's vineyard, and are willing to contribute the best of their labours therein for the promoting of God's glory, and the edifying of his people."—(Church Dictionary.) Calvin defines the inward call, in his Institutes, to be "the good testimony of our own heart that we have taken this office, neither for whitten correleveness now any avil degires but out of ambition, covetousness, nor any evil design, but out of a true fear of God, and a desire to edify the Church." Call, among Presbyterian churches, is applied to the invitation given by a church to one duly qualified to become their pastor. The question as to the right of a congregation to choose their own pastor has led to frequent dissensions in the Church of Scotland, and was the cause of the disruption of that body, which took place in 1843. (See PATRONAGE, FEER CHURCH. SCOTLAND, CHURCH OF.)

CALL (Fin.), a term used in monetary transactions, signifying a demand for the payment of certain instal-ments due on shares issued by joint-stock companies. In the formation of such companies, shares of a fixed an une formation of such companies, shares of a fixed amount are offered to the public, purchasable upon expressed conditions. A stipulated sum is paid upon the delivery of the preliminary acknowledgment, sectionally known as scrip; and all shareholders are liable to be "called" upon from time to time to pay further sums, until this amount is paid up; hence the parass.

This application is usually regulated by the board of directors, and is dependent upon the progress of the speculation or the necessity that may exist for the employment of additional capital. It has, however, a somewhat different meaning on the Stock Erchange, somewhat different meaning on the Stock Exchange, where a "sall" is then a person gives so much for the option of baying stock (public securities) at a specified time, the price and date being settled at the time the option smore is given.—Ref. Fenn on the Funds, do. Call, a kind of silver or brass whistle, used by the

bostswain and his mates to summon the sailors to their posts, and to direct them about the various employments of the ship. A gold call was formerly the insignia of an admiral.

Casa or THE HOUSE, in parliamentary proceedings s an imperative aumons, issued to every member of seither house, to attend on some particular occasion, when important matters are to be brought before them. In the House of Lords, when any urgent business is deemed to require the attendance of the Lords it has been usual to add the backen used to the lords of the lords it has been usual to add the backen used to require the strendance of the Lords, it has been usual to order the house to be called over; and this order has sometimes been enforced by fines and imprisonment upon absent lords. The most important occasion on which the house was called over in modern times was in 1820, when the bill for the degradation of Queen Caroline was pending. The bouse then resolved "that no lord do absent himself on pain of incurring a fine of £100 for each day's absence, pending the three first days of such proceed-ings, and of £50 for each subsequent day's absence from the same; and in default of payment, of being taken into custody." When the House of Commons is ordered to be called over, it is usual to name a day which will enable the members to attend from all parts of the country. If it be really intended to enforce the call, not less than a week, or ten days, should intervene between the order and the day named for the call; the interval, however, has varied from one day to six weeks. The order for the house to be called over is always accompanied by a resolution, "that such members as shall not then attend be sent for, in custody of the sergeant-at-arms." On the day appointed for the call, the order of the day is read and proceeded with postponed, or discharged, at the pleasure of the house. If proceeded with, the names are called over from the Return Book, according to the counties, which are arranged alphabetically,—
the members for the county being called first, and
then the members for the oities or boroughs within
that county. The counties of England and Wales are called first, then those of Scotland and Ireland in their order. The names of members who do not in their order. in their order. The names of members who do not answer when called are taken down by the clerk of the house, and are afterwards called over again. If they appear in their places at this time, or in the tours of the evening, it is usual to excuse them for their previous default; but if they do not appear, and no excuse is offered for them, they are ordered to attend on a future day. It is also customary to to attend on a future day. It is also customary to excuse them if they attend on that day, or if a reasonable excuse be then offered; but if a member

called earns is they accend on case day, or is feasonable excuse be then offered; but if a member
should not attend, and no excuse is offered, he is
liable to be committed to the outsody of the sergeantst-arms, and to the payment of the fees incident to
that commitment.—Ref. May's Low of Parliament.

Call of the Same Same of Calling the Calling of Calling the Calling of Calling the C

form), small beetles, infesting houses, and very destrucform), small bestles, infesting houses, and very destruc-tive to woodwork, especially of spruce and fir. One of this family (Callidium bejulus), a flattish, rusty-black insect, will, according to Messrs. Kirby and Spence, but even hore through sheet-lead; fragments of lead having been found in their stomachs. Calling been found in their stomachs. Calling or found in their stomachs. Calling or found in their stomachs. Talling or found in their stomachs. Calling been found in their stomachs.

drangular fruit, winged at the angles. The species C. Pallasia, which is found on the sandy steppes near the Caspian Sea, is valued by the wandering Kalmucks for the acid juice of its fruit and aboots, which often serves to aliay their thirst; and also for the nutritious gum which may be obtained from its

root.

CALLIFEDIA, käl-le-pe'-di-d (Gr. kalles, beauty, paidia, children), the name of a Latin poem in four books, by the French abbot Claude Quillet de Chinon, and published under the fictitious name of Clavides Lectus. The full title of the work is "Callipedia; seu, de pulchræ Prolis habendæ Ratione;" and was translated into Euglish verse by Nicholas Rowe.

CALLIPERS. (See CALIBER COMPASSES.)
CALLIPERS, kill-e-tris, in Bot., a gen. of conference plants. C. quadrivalvis, the arar-tree, yields the resin called sandarach, juniper resin, or gum-juniper, which is imported in large quantities from Magadore. It is nuch employed in the preparation of varnishes. When powdered, it is called pounce. The timber furnished by this tree is very durable, and is used by the Turks for the floors and ceilings of their mosques.

Callosity, kil-os'-i-te (Lat. cullositus), it an indura-tion or hardness of the skin; as that of the hands

through bard labour.

CALLUS, kall-us, in Surg., is the bony natter which is deposited between the fractured ends of broken bones. It is an osseous substance, formed by a process of nature for the reuniting of brokes bones.

Calm, kum, in Mar., the name given to that atate complete rest in the air when there is no wind stirring. The regions in the immediatevicinity of the equator are the parts of the ocean where the mariner is overtaken by the most frequent and most durable culms. In the Atlantic Ocean the region of calms has a breadth of six degrees. The Pacific Ocean derives its name from being characterized by an equatorial belt of calm region averaging five degrees in breadth, and lying between the south-eastern and north-eastern trade-winds. (See TRADE-WINDS.) In these came latitudes rain is constantly falling; and when Captain Wilkes, of the United States exporing expedition, traversed them in 1838, he found that in the ten days he was making the journey the constant aqueous precipitation was at the rate of upwards of eighteen feet per year. The calm latitudes of the Atlantic Ocean are situate between the tropic of Cancer to very nearly lat. 29° N.

CALOMEL, käl-o-mel (Gr. kats, good, melas, black, from the qualities and colour of he Ethiop's mineral to which the name was original! applied), chloride of

which the name was original applied, cultival of mercury. (See Mrscurx, Chordible Or.).
Calophyllium, kalo-fill-un (Gr. kalos, beautiful, phullon, leaf), in Bot., a ger of plants belonging to the nat. ord. Guttiferæ, including many valumble timber trees. C. angustifolium, thepiney-tree of Penang and the islands to the eastward of the Bay of Beugal, furnishes fine straight spars. C. calaba and C. inophyllum, besides yielding timbe, produce seeds from which good burning oil is obtained. The fragrant resinons substance known as East ndian tacamahaca is a product of the species of this genus.

Calou Mondicans, ke'-or mor'-de-kans (Lat., biting heat), in Med., is applied to a particular kind of beat, that sometimes attend typhus and other fevers, and is considered a dangerus symptom. It is biting and pungent, rather than burning, and leaves a smarting sensation on the figers for several minutes after

touching it. CALORIC. (See BAT.)

CALORIC-ENGINY kallor-ik, an engine in which the power is derived from the expansion of air by beak. The calorie-engines a name given to a particular air-engine by Captai/Ericason, a Swedish engineer resident in America In its working parts, the caloricengine closely reembles the steam-engine; the heated air acts upon spiston which works in a cylinder, and the piston-rod ad connecting rod convey the power to the crank an main shaft. The calorio-engine seems the crank an main shaft. The caloric-engine accuse to resemble cosely the air-engines of Messra. Stirling. In the earlie air engines, such as those made by Sir. George Cay'y and others, the air was passed through a heated chuber, by which means it was raised to a temperatre of nearly 600°, and after doing its work is

## Ualorimeter

was allowed to escape. By this process, a great quantity of heat was wasted. In Stirling's air-oughes and in Priceson's caloric-engine, she chief improvement lies in the ingenious way in which the heat is economized. The chamber in the caloric-engine, through which the hot air passes, is filled with fine wire, putting, placed side by side, to the thickness of treelye to twenty inches. On leaving the cylinder, the air, after performing its work on the cylinder, is made to pass outwards through this chamber. In its passage, a quantity of its heat is abstracted by the metal network and given up again to accuracted by the metal network and given up again to the returning air, which passes inwards through the same chamber. The returning air, with a slight ac-cession of heat from the furnace, produces another effective stroke of the piston; heat, which would otherwise have been wasted, is thus retained, and a corresponding quantity of fresh heat and fuel is saved. Very few of the many ingenious varieties of air-engines have succeeded. In 1853, Captain Ericeson tried a very bold experiment with his caloric-engine. He introduced it into the Ericeson, a first-class vessel of the ordinary steam-boat pattern. The register of the ship ordinary steam boat pattern. The register of the ship was 1,903 tons, and she was furnished with paddles. Instead of one funnel, however, she had four small tubes, gaily painted in white and gold. The caloricengine consisted of two pairs of cylinders, connected in their action, but not placed side by side. Each pair was composed of two cylinders, of which the lower one was much the larger. The upper was called the "supply cylinder," the lower the "working cylinder," The diameter of the working cylinders was 169 inches, and that of the supply, 137 inches each. This enormous bore, however, 14 and 12 feet alternately, was found insufficient to perform the work required. Briesson afterwards reduced the size of the cylinders, and the stable conversed with the company to have and used highly compressed air. All the results, how-ever, were unfavourable. Caloric-engines, for per-forming lighter work, such as printing, &c., are much used in North America, and, with additional improvements, it is probable that they will be very extensively

CALORIMETER. (See Hrat.)
CALORIMETER. (See Hrat.)
CALOTROPIS, kā-lot'-ro-pis (Gr. kalos, beautiful, tropis, keel, in allusion to the keel of the flower), in Bot., a gen. of tropical plants belonging to the nat. ord. Asclepiadacea. The species C. gigantea or procera yields the medicinal bark known as Mudar bark, which has been much employed in India for the treatment of cutaneous affections, and occasionally as a substitute for ipeca-cuanha. It contains a peculiar principle, called muda-rins. The fibres of the bark are known under the names of Ak and Mudar fibres. The bark of the root of C. Hamiltonis has similar properties, and is said to yield the fibres termed Yercum.

ALOTTISTS, OF LE RÉGIMENT DE LA CALOTTE, kalog-ists, the name of a society of wits and satirists in France during the reign of Louis XIV., at the head of which were Torsac and Aimon, officers of the royal guard. They took their name from calotte, a little cap, such as was worn by the monks to cover the tonsure. If any public character committed a ludicrous or stupid blunder, the society would send him a patent to wear the calotte as a protection for the weak part of his head. The arms of the society consisted of various in-signis of folly, and it had for its motto, C'est regner signs of folly, and is had for its motion, or ear regimer que de scooir rire. As it numbered among its members many persons of high rank, it was possessed of con-siderable power, and, at length, became so audacious as to attack even royalty itself. It was dissolved by the ministra Flaury. At the time of the Netwerstop the minister Fleury. At the time of the Reformation, the term regime de la calotte was applied to priestly rule

CALOTYPE, kell-o-tipe (Gr. kalos, beautiful, tupos CALOTYPE, këll-o-tipe (Gr. kalos, beautiful, tupos, impression), a name given to a process in photography discovered by Mr. Fox-Talbot. It is often called the Talbotype, but the name at the head of this paragraph is the most usual. The method of taking calotypes is as follows:—A piece of paper is saturated with a solution of iodide of potassium, dried, and laid on a bath of nitrate of silver. Iodide of silver is formed, and the paper is washed in clean water, and dried. When examined in a good light, it is found to be of a delicate canary-yellow colour, due Indiana fill the calumet with the best tobacco, and to the formation of iodide of silver on the surface. It is present it to those with whom they have concluded sandered sensitive to the light by being laid on a solution any important business, smoking out of it themselves.

## Culumet

of nitrate of allver, to which have been added galland acetic acid. It is then dried, exposed to the in the camera, and developed with a solution of acid to which have been added a few drops of mitrate of silver. When all the details have applit is well washed, and the unsistered iodide of all dissolved out by means of a triturated solution hyposulphate of sods. The picture is once as washed, and then waxed to render it semi-train The result is a negative picture, i.e., a pict with the lights and shadows reversed. To pro with the lights and shadows reversed. To produce a positive from this, it is superposed on a piece of schaffitzed paper and exposed to the light. The light shining through the shadows, which, being reversed, are transparent, blackens the paper, whereas the lights, being opaque, stop the light from acting on the sensitive surface, and leave it white. This operation is

called printing. (See Photography.).

Calours, kil-oi'-ers (Gr. kalogers, good old men), is a general name given to the monks of the Greek church. They follow the rule of St. Rasil, whom they church. They follow the rule of St. Basil, whom they regard as their father and founder. There are three degrees among them: the novices, who are called dechur; the ordinary professed, called Microchem; and the more perfect, called Megalochem. They are likewise divided into comobites, anchorets, and reclusive. They have four Lents, the first and greatest of which, for the resurrection of our Lord, is called the grand quarantain, and lasts for eight weeks. During this Lent the religious drink no wine. All the monks are obliged to labour for the benefit of the monastery as, long as they continue in it. The most considerable long as they continue in it. The most considerable monastery of the Caloyers in Asia is that of Mount Sinai, which was founded by the emperor Justinian, and endowed with 60,000 crowns revenue. They have also numerous monasteries in Europe, the most cells-brated of which are those of Mount Athos, in Macedonia. There are also female Caloyers, or Greek nuns, who likewise follow the rule of St. Basil, but their nun-

neries are always dependent on some monastery.

Caltha, käll-tha (Gr. kalathes, a goblet), in Bot.,
a gen. of plants belonging to the nat. ord. Runnisculacka, tribe Helleborea. The species C. palustria,
commonly known as the Marsh Marigold, grows wild in marshy places, and has showy bright yellow flowers.

CALTROP, käll-trop (Sax. coltrappe), a piece of iron consisting of four sharp spikes projecting from a com-

mon centre in such a manner that three of the points will rest on the ground and the fourth stand upright in whatever way it may be thrown from the hand. Caltrops are sometimes thrown down before infantry or artillery, to check a charge of cavalry, or in a breach to impede the advance of the storming party; they are, however, far more injurious to cuvalry than infantry. Cal-



CALTEOP.

trops are sometimes called crow's-feet.

CALUMBA, kā-lum'-ba, the name given to a root ver extensively used in medicine as a stomachic and mild tonic. It takes its name from Colombo, in Ceylon, whence it was first brought. (See JATRORHIZA.)

CALUMET, OF PIPE OF PRACE, kall-u-met, is the name given by the North-American Indians to a tobacco-pipe of a particular construction. The bowl is of pipe of a particular construction. The bowl is et polished marble, and the stem is of strong reed, 25 feet long, and adorned with looks of women's bair and



# Calumny

To present it to strangers is a mark of after them. hospitality.

hospitality.

CALUMEN. (See Inest.)

CALUMEN. (See Inest.)

CALUMEN. OATH OF, in the old law of Scotland, was an each that both parties to a lawsuit might be ordained to take, by themselves or their counsel, that they believed their case to be true and good. The object was to prevent rash and unprincipled lawsuits. An Act of Sederunt (1st February, 1715) requires, that before asking the oath, a sum shall be consigned, to be forefisted to the other party on his deponing in to be forfeited to the other party on his deponing in the affirmative. Though still recognized, it is now

the afficientive. Though still recognized, it is now almost anknown in practice.

Carvary, kill-nd-re, in Roman Catholic countries, is a name given, from the mount on which Christ was crucified, to certain places either adjoining a church and the countries of the country where are represented various outside a town, where are represented various somes of the passion of our Lord. One of the most selebrated is that of Mount Valerian, near Paris, which is composed of seven chapels, in each of which some mystery of the Passion is represented.

\* CLLYMISM, kill-vin-irm, is the name given to certain theological doctrines, after John Calvin, the celebrated reformer. Generally, all who hold these doctrines, of whatever sect, are termed Calvinists; but it is applied more particularly to the reformed churches of Switzerland and Germany, as distinguished from the Lutheran. Luther, notwithstanding his dauntless courage in opposing the corruptions of the papacy, and the part thing which gave offence to a number retained many things which gave offence to a number of the reformers. He was disposed to treat with toleration images, alters, wax tapers, private confession, and the mass. To all of these Calvin was opposed. He declared the Church to be a separate and independent dens body, endowed with the power of legislation for itself, and left to the civil magistrate little more than the privilege of protecting the Church and providing for its wants. He maintained that the Church ought to be governed like the primitive Church, only by synods and presbyteries, that is, by assemblies of ciders, composed both of clergy and laity; and that among the ciergy all are by the law of Christ equal in rank and authority. His religious discipline was severe, and excommunication was a civil sentence. In divinity, Calvin was an implicit follower of St. Augustine, and taught, with the great Latin father, the doctrine of the absolute decrees. The leading doc trines of Calvinism, as opposed to Arminianism, and as explained and confirmed by the synod of Dort, are the five following :- 1. That God has chosen a certain number of the fallen race of man unto eternal glory before the foundation of the world, without the least foresight of faith, good works, or any conditions per-formed by the creature, and that the rest of mankind he was pleased to pass by and ordain to dishonour and wrath for their sins. Predestination, however, is held not to affect the agency or accountableness of oreatures, or as being to them any rule of conduct.
On the contrary, they are supposed to act as freely,
and to be as much the proper subjects of calls,
promises, and threatenings, as if no decree existed.—
2. That though the death of Christ be a most perfect escrifice and satisfaction for sins, abundantly sufficient to expisite all those of the whole world; and though on this ground the gospel is to be preached to all mankind indiscriminately, yet it was the will of God, that Christ, by the blood of the cross, should efficaciously sedeem those, and those only, who were from eternity elected to selvation, and given to him by the Father.

That all mankind are totally deprayed in consequence of the full of Adam, who, being their federal head, his sin involved the corruption of the bosterity which corruption renders them unable of themselves to do auxthing truly good, and exposes them to his rightcous displeasure, both in this world and in that which is to come.—
That all whom God has predestinated unto hie he is pleased in his appointed time effectually to call by his word and spirit out of that state of sin and death in which they are by nature, to grace and salvation by Jesus Christ.—5. That those whom God hath effectually called and sanotified by his spirit, may fall partiety, or for a time, but shall sever fall inally, from a configuration of grace. These tenets, however, are not beld to same extent by all who bear the name of Calvinists. Ana

# Calydiflore

There are some who consider that they go too far, and these are known as Modersta Calvinists; and there are others, known as High Calvinists, who think that they do not go far enough. Calvinism originally existed in its greatest purity in the city of General whence it extended into Germany, France, the United Provinces, and Britain. In Germany the followers of Calvin constitute the Reformed Church. In Example Calvin constitute the Reformed Church. In France, Calvinism was abolished by the revocation of the edict of Nantes. In Holland it still continues to be the prevailing religion. In England it was adopted and made the public rule of faith in the reign of Edward VI.; but since the time of Elizabeth it has been on the but since the time of Elizabeth it has been on the decline, though latterly a revival has been taking place. In Scotland, Calviniam, as cetablished by John Knox, the disciple of Calvin, has been most enduring, and exists there in its greatest purity. Generally, however, the extreme doctrines of Calvin may be said to be rapidly losing ground, though Calviniam, in its milder form, is the professed creed of Presbyterians, Independents, Baptists, Methodists, &c., in both the Old and the New world.

Calx. (See Calcium)

CALX. (See CALCIUM.)

CALY. (See CALCIUM.)
CALYCANTRICEE, kill-o-kin-thai'-sc-e, in Bot., the Calycanthus fam., a nat. ord. of dicotyledonous plants in the sub-class Calyo/floræ. These are shrubby plants, greatly resembling the Rosaceæ, but they differ in having opposite leaves, which are always simple, entire, and exstipulate; sepals and petals numerous and similar in appearance; stamena with anthers adnate and turned outwards; and lastly in having convolute cotyledons. There are but two genera, Calycanthus and Chimonanthus, the species of which are natives of Japan and North America. The flowers have a peculiar aromatic fragrance. The bark of C. have a peculiar aromatic fragrance. The bark of C. floridus, the Carolina allspice, is sometimes used in the United States as a substitute for cinnamon-bark.

CALYCEBACEE, hile-es-rail-se-e, in Bot., the Calycera lam, a nat. ord. of dicotyledonous plants in the sub-class Corollifore. They are exclusively natives of South America, and hold an intermediate position between Dipsacea and Composite; being distinguished from the former by their alternate leaves, by the absence of involucels to the individual florets of the capitula, by the valvate restivation of the corolla, and by their monadelphous filaments and partially-united authers; from the Composita, by the authers being only partially united, and by the pendulous albuminous seed, with superior radicle. The properties and

uses of these herbs are unknown.

CALYCIFLORE, kales see flor'e, in Bot., a sub-class of Dicotyledones, comprising plants with flowers having the following general characters:—Calyx and corolla usually present, the petals of the latter being generally distinct, but sometimes connate (slightly connected); stamens perigynous (borne on the calyx, but free from stances perigynous (borne on the calyx, but free from the ovary), or else epigynous (apparently ecated on the ovary). The Culyciflora are subdivided into Peri-gyna and Epigyna. In the first of these subdivisions, the calyx is free, or nearly so; the stamens are usually perigynous, and the ovary is superior. In the second, the calyx is more or less adherent, and the ovary in-ferior. Professor Bentley describes fifty-one calysi-foral orders, namely floral orders; namely,— Sub-din. 1, Perigynæ.—Celastraceæ (the Spindle-tree

ord.), Stackhousiacem, Staphyleacem (the Bladder-nut ord.), Vochysiacem, Rhamnacem (the Buckthorn ord.), Anscardincese (the Cashew-nut ord.), Sabiacese, Connaraceæ, Amyridaceæ (the Myrrh and Frankincense ord.), Leguminosæ (the Bean ord.), Moringacese, Roord.), Leguminose (the Bean ord.), Moringaces, Mosaces (the Bose ord.), Calycanthaces, Lythraces, Saxifragaces, Hydrangeaces, Hensloviaces, Cunoniaces, Crassulaces (the Houseleck or Stone-crop ord.), Francoaces, Parouychinose, Portulacaces, Mesembryaces (the Ice-plant ord.), Passifloraces (the Passion-flower ord.), Malusnerbiaces, Turneraces, Parameter, Paramet

payacese, Pangiacesa.

payaces, l'anguaces.

Sab-div 2, Epigyna.—Cacurbitaces (the Gourd or Cucumber ord.), Loasaces, Homaliaces, Cactaces (the Cactas ord.), Grossulariaces (the Gooseberry or Currant ord.), Escalloniaces, Philadelphaces (the Syringa ord.), Myrtaces (the Myrtle ord.), Lecythidaces (the Brazil-nut ord.), Chammelauciaces, Barring-toniaces, Belvisiaces, Melastemaces, Opagraces (the Evening-primross ord.), Haloragaces (the Mars's-

# Calymene

tail ord.), Combretaces (the Myrobalan ord.), Rhisophoraces (the Mangrove ord.), Alangiaces, Cornaces,
Hamamelidaces (the Witch-hasel ord.), Bruniaces,
Umbellifere, Arailsone (the Ly ord.).
CALTHERS, kill-e-mel-ns (Gr. kekalumens, concealed),
in Gool, a gen. of trilobites, so named from the obscurity which long hung over the real nature of these
fossil crustaceans. The genus belongs to the Silurian
system, and is particularly well represented in the
Ladlow rocks. It is distinguished by its ovate, convex, and deeply-trilobed shell or crust, which is occasionally found coiled up like the oniscus, or woodsionally found coiled up like the oniscus, or wood-louse. The most abundant species is C. Blumenbachii, which has long been known as the Dudley locust. (See

TRILOBITE.)

DANK, kei'-like (Gr.), in Bot., the external enve-pe of the flower. It is composed of modified leaves, CALTX, key-ties (UT.), in posed of modified leaves, called sepals, which are usually green. Within the whorl of sepals there is generally another whorl of leaves, called the corolla (which see), but sometimes the calyx is the only envelope of the parts of fructification. The calyx may either consist of a number of as in the poppy, buttercup, and wallseparate sepals, as in the poppy, buttercup, and wall-flower, or these parts may be more or less united, as in the fachesia, melon, and tobacco. In the former case, the only is termed polysepalous or polyphyllous; case, the calyx is termed polysepalous or polyphyllous; in the latter, monosepalous or monophyllous, or, more correctly, gumosepalous or genophyllous. Sepals are generally of a more or less oval, clliptical, or oblong form, with the extremity either blunt or acute. In their direction they are erect, or pointed upwards; countient, or turned inwards; divergent or patulous, apreading outwards; or if their spices are turned downwards, reflexed. When of the sual green colour, the state of the colour of the sual green colour, the content of the colour of the sual green colour, the content of the colour of the sual green colour, the content of the colour of t downwards, reflexed. When of the usual green colour, they are said to be foliaceous or herbaceous; but when coloured, as in the fuchsia and tropwolum, petaloid. Whatever be its colour, the external envelope must be considered as the calyx. In describing a polysopalous uslyx, the number of parts is indicated by the prefix of a Greek numeral; thus a trisepulous calyx has three sepals, a pentusepulous calyx, five; and so on. When the sepals are of equal size and like form, and arranged in a symmetrical manner, the calyx is said to be regular; when they are of different sizes and forms, it is irregular. In a monosepulous or gamosepalous calyx, the parts adhere in various ways. Thus the union may only take place near the base, as in the pimpernel, when the calve is said to be partite; or it may extend to about the middle, as in the centaury, when it is deft or feaured; or the joining may leave but a small portion of each sepal free, as in the lychnis, so as to form a toothed calvx; or the union may be complete, as in the chrysanthemum, in which case the calvx is termed entire. The number of partitions, fissures, or teeth, is also indicated by Latin numerals, as in the terms quinque-partite (five-parted), quinque-fid (five-eleft), and quinque-dentate (five-toothed). In a monosepalous calvx the part formed by the union of the sepals is sometimes called the tube, the free portion the limb, and the orifice of the tube the throat. The tube of the calyx sometimes tude the throat. The tube of the caryx sometimes adheres, more or less, to the ovary, as in their is, gooseberry, currant, and in all plants of the Composite When such adhesion takes place, the calyx is said to be adherent or superior, because it appears to arise from the summit of the ovary. When there is arise from the summit of the ovary. When there is no such adhesion, the ovary being quite distinct, as no such adhesion, the ovary being quite distinct, as in the wallflower and buttercup, the calyx is described as free, non-adherent, or inferior. Many other terms which are sometimes applied to the calyx are explained under the heads Luar, Corolla, and Flowers.

Can, take, in Machinery, a plate with curved sides, fixed on a revolving shaft for converting a rotatory motion into a rectilinear. For instance, in the confinence with hummar a cam is fixed on a shaft and

ordinary tilt-hammer a cam is fixed on a shaft, and as it revolves, depresses the end of a lever, upon the other end of which is fixed the hammer-head.

are also called tappets and wipers.

CAMALDOLITUS, ki-mill-do-lites, the name of a religious order established by St. Romusld, a Benedictine monk, in the vale of Camaldoli, near Arezzo, in the Apennises, in 1018, and afterwards confirmed by Alexander II. in 1072. They were originally her-mits, living in separate cells; but as their wealth facreased, they came to secociate together in convents.

# Cambrian Books

They rapidly spread, and from Italy they extends into France, Germany, and Poland. They wear winto garment, and observe the sustere rules of the Benedictines; but as an order they are now almost extinct.

CAMER NUTMER, ka-ma'ra, a false or wild sus-meg, obtained from the Acrodickidium Camara, a plant of the Laurel ord., growing in Guiana. It is also known as the Ackawa nutmeg by the natives, who can-

ploy it as a spice.

CAMARILLA, kčm-d-ril-la (Sp., a little chamber, din
of camara, a chamber), is a word borrowed from Spein and employed in modern political language to signify the influence of secret and unaccredited councillors in matters of state or government. In Spain, where the term was first used, this influence has had a most permicious effect. Under Ferdinand VII. the name was applied to those flatterers by whom that monarch was mostly influenced, and who were generally men without talent, and opposed to every kind of reform. The word was also much used in France during the reign of Charles X.

Camassia, ki-misi-se-a (from quamash, its native name), in Bot., a gen. of plants belonging to the nat. ord. Liliacea. The species C. seculents, a native of North America, has edible roots, which are used by the Red Indians under the name of quamash. They are also

known as biscuit-roots.

CAMAYRU, kim'-a-yu.—A painting executed in different shades of one colour is said to be en camayeu. This term may be applied to drawings in sepis and Indian ink, and even to those in chalk and pencil. It is synonymous with the expression "monochrome;" but it was also originally applied to paintings in which more than one colour appeared, although one particular tint prevailed, and almost concealed the others.

CAMBER, kam'-ber, a term used in Carpentry to denote the convexity in the middle of a beam to prevent its becoming bent by its own weight, or the weight it has to sustain. Camber slip is a piece of wood curved differently on each side, for drawing the upper and under lines of straight brick arches.

CAMBIO, kim'-be-o (Lat., I clinnge), is a term some-times used in the mercantile phraseology of various countries, particularly of Holland, in the sense of exchange.

change.

Cambista, kām'-bist (Ital, cambista, a banker, money-changer), is a term applied to one who exchanges foreign money, or deals in foreign notes or bills of exchange. It is also applied to a book in which the weights, measures, and moneys of different countries are constant. verted into those of one particular place; as, Kelly's Universal Cambiat.

CAMBIUM, kam'-be-um (Lat. cambio, I change), in Bot. a layer of vitally active cells placed on the outside of each annual zone of wood in an exogenous stem. It is from this that the new layers of wood and liber are formed. The cells of which it is composed are of a very delicate nature, each consisting of a thin wall of cellulose, within which are situate a primordial utricle, a nucleus, and abundance of protoplasm. (See CELL.) a thin wall of The cambium layer is dormant during the winter, at which time the bark is firmly attached to the wood beneath; but in spring it is in full scrivity, being charged with the elaborated sap of the plant; and then the back may be separated from the wood beneath. At all seasons, however, the bark and the word are organically connected, and can only be separated by rupturing the delicate cells of the cambium-layer.

CAMBOGE, improperly GAMBOGE, kam-bogi, a gum resin exuded by one or more species of Garvinia, trees found principally in Siam. It is soluble in elcohol, and found principally in Siam. It is soluble in alcohol, and forms an emulsion with water. It is much used as a pigment, and also occasionally in medicine. It acts, when swallowed, as a powerful drastic purpative. A specimen of Siam camboge, analyzed by Dr. Christison, contained 74 per cent. of resin and 22 per cent. of arabin, the rest being moisture. Its use as a medicine must be carefully regulated, as the slightest overdose causes violent purgation and vomiting. It is said to form a considerable portion of a certain quack medicine sold by a self-constituted "College."

CAMPATAN ROCES, kms. bre-can, in Occl., a term spelied by Professor Sedgwick to the lowest focularous rocks, on account of their extensive develop-

ment in North Wales, anciently called Cambria. According to the classification of the government geological surveyors, the term is at present limited to a series of anadstones, gristones, and slates, which undorlie the Bilurian Lingular strata. (See SILURIAN

CARRIAGO Locim'-brile, a fine linen fabric, first made at Cambray; hence its name. It bears the same relation to linen that muslin does to calico. Scotton cambric is made of hard-twisted cotton. The French material batiste, so much used for printing, is a cotton

CAMBRIDGE MANUSCRIPT. (See BEZE CODEX.) CAMERINGS, UNIVERSITY OF, kaim' brij, one of the wo bighest educational institutions of England, is strated in the town of Cambridge, from which it takes its hame. Its early history is involved in much obscurity, but it seems to have originated in certain schools established here about the 7th century. Ed-ward the Elder, son of Alfred, is said to have erected, at his own expense, halls for the students and chairs and seats for the doctors, at the same time appointing teachers and adopting other necessary measures for the success of the institution. Some, however, main-tain that a regular system of education was not intro-duced till 1109, when Joffrid, about of Croyland, having sent some learned monks, well versed in philosophy and the other sciences, to his manor of Cottenham, near Cambridge, they went daily into that town, mear Cambridge, they went daily into that town, where, in a hired burn, they gave lectures in the sciences, which were attended by a large concourse of students. The earliest charter known to have been granted to the university is that of 15 Henry III. (1229). At this time, the students lodged in the houses (1229). At this time, the students lodged in the houses of the citizens, and the extravagant demands for rent gave rise to numerous disputes between the scholars nd townsmen; and hence the king ordained that townsmen; and nence the king ordanised that fazors be appointed, namely, two masters and two respectable and lawful men of the town, to fix the rent to be paid by the students for lodgings at a reasonable rate. Afterwards, hostels or hulls began to be established, where the students lived at their own charges, under the superintendence of principals, who their pupils. The first endowed college was that of St. Peter, founded in 1257; and, as the colleges began to increase, the hostels disappeared. Of the other colleges, five were incorporated during the 14th century, four in the 15th, six in the 16th, and one, Downing College, in 1800. All of these colleges are maintained by the endowments of their several founders and benefactors. The university obtained its first formal charter of privileges from Edward I. in 1291, and subsequent charters, with various privileges, were granted by Edward II., Edward III., Richard II., and Henry IV. Additional privileges were conferred upon they Henry V.,
Edward IV., Henry VII., Henry VIII., and Queen
Elizabeth, in the third year of her reign. By act of
parliament, 13 Eliz. c. 29 (1570), all preceding grants,
from Henry III. downwards, were confirmed, and the
university was declared to be incorporated by the name university was declared to be incorporated by the name of "the chancellor, masters, and scholars of the University of Cambridge." In 1614, James I. conferred upon it the right of sending two members to the House of Commons. The present university statutes were confirmed by Queen Victoria, by order in council, Mat July, 1858. The university "is a union of seven-seem colleges or societies, devoted to the study of learning and knowledge, and for the better service of the cohurch and state." Each college is a body corporate hourd by its own statutes, but is likewise constants. the church and state. Each conege is a may con-perate, bound by its own statutes, but is likewise con-trolled by the paramount laws of the university. Each of the seventeen colleges or departments in this literary republic furnishes members both for the executive and legislative branch of its government. All persons who are masters of arts or law, or doctors in one or other of the three faculties, viz. divinity, law, and physic, having their names upon the university register, have es in this assembly or senate. Their meetings are heid in the senate-house. The council of the senate established by 19 & 20 Vict. c. 88, consists of the chanestablished by the 20 vice. C. co. consists of the characteristic four heads of colleges, four professors of the university, and eight other members of the senate, chosen from the electoral roll published by the yose chancellor. Two of the heads of colleges,

two of the professors, and four other members of the senate, are elected by the persons whose names are on the electoral roll, and they all hold office for four years. All public business must be approved of by the council All pools ousness must be approved to by the constant before it can be brought before the senste. A few days before the beginning of each term, the vice-chancellor publishes a list of the several days on which a congregation or assembly of the senate will be held for transacting university business. These fixed days occur about acting university business. These tixed any sociar about once a fortnight; but, in case of smergency, the vice-chancellor may summon a congregation for the dirpatch of extraordinary business, three days notice of such meeting being previously given. The principal officers intrusted with the executive are the chancellor, high steward, vice-chancellor, commissary, and assessor. The chancellor is the head of the whole university, and presides over all cases relating to that bedy. In him is vested the sole executive authority within the precincts, except in matters of mayhem and felony. The office is tenable for two years, or for such longer period as the tacit consent of the university may choose to allow. The high steward has special power to take the trial of scholars impeached of felong within the limits of the university, and to hold and keep a list according to the established charter and custom. The vier-characterior is elected annually on the 4th November Ly the senate, and his office em-braces, in the absence of the chancellor, the execution oraces, in the absence of the chancellor, the execution of his powers, and the government of the university, according to her statutes. The consistancy is an officer under the chancellor, and appointed by him, who holds a court of record for all privileged persons and scholars under the degree of M.A. The assessor is an officer specially appointed to assist the vice-chancellor in his court. The sex wiri hold office for the court and their housings is the hear and a statute for the court. two years, and their business is to hear and adjudicate, together with the vice-chancellor, all accusations against members not in statu pupillari for offences against the statutes or ordinances of the university. They may statutes or ordinances of the university. They may punish by deprivation or suspension of degrees, but there is liberty of appeal from their decision to the senate. The public orator is the voice of the senate upon all public occasions. The two proctors, who must be masters of art or law of at least three years' standing, or bachelors of divinity, are elected annually, and their especial duty is to attend to the discipline and behaviour of all persons in statu pupillari, and to search houses of ill fame. The registrary sees to the due form of the "graces," and registers them in the university records. The two moderators superthe university records. The two moderators super-intend the examinations of the candidates for honours in the mathematical tripos. Two pro-proctors are appointed to aid the proctors. The three eaguire bedsite tend the vice-cusncellor, whom they precede with their silver maces upon all public occasions and solemnities, and summon to the chancellor's court all members of the senate. The two members of parliament are chosen by the collective body of the senate. The professors are paid some from the university chest, others by her Majesty's government, or from estates left for that purpose. The annual income of the university is derived from various sources, the principal of which are the following :-- the rectory of Burwell and a farm at Barton, producing about £1,000 per annum; the fees at matriculation and for degrees, and the profits of the university press, in all probably amounting to between £5,000 and £8,000. The funds are managed by the vice-chancellor, or by specific trustees, and the accounts are examined annually by three auditors, appointed by the senate. The terms of the university are three,—Michaelmas, or October term, from the lat October to the 18th December; Lent, or January term, from the 13th January to the Friday before Palm Sunday; and the Easter, or Midsummer term, from the Friday after Easter-day Midsummer term, from the Friday after Easter-day, to the Friday after Commencement-day, which is always the last Tuesday but one of June. There are four classes of students:—1. Noblemes and fellow commoners, who are generally the younger sons of the nobility, or young men of fortune; and are so called from having the privilege of dining at the fellows table.—2. Scholars, who are generally foundations members of their respective colleges, elected by direct examination, or otherwise, from the most promising and distinguished of the students, and who engage

various advantages; as having their rooms and commons free, or other allowances.—3. Pensioners, who form the great body of the students, paying for their rooms and commons, and in general enjoying to pecuniary advantages.—4. Sizzer, who are generally students of limited means, and sho usually have their commons free, and receive various emoluments, and are a longer required to perform the means. and are no longer required to perform the menial offices that they once were. A student is admitted on the boards of a college, either by a personal examinathe boards of a college, either by a personal examina-tion, or through a recommendatory certificate signed by a master of arts of the university. If the certifi-cate be deemed satisfactory, the name is at once entered on the college boards, and the student usually comes into residence at the October term following, when the academical year begins. During the first year of his course the undergraduate is a freshman; during the second a junior soph; and during the third a sentor soph. The first university examination, tech-nically termed the "previous," or "little go," takes place in the Lent term of the second year of the student's course, and a certificate of having passed this student's course, and a certificate of having passed this examination is indispensable to taking a degree. The subjects of examination are one of the four Gospels in the original Greek, Paley's "Evidences of Christianity," one of the Greek and one of the Latin classics, the Elements of Euclid, books i. ii. iii, and arithmetic, After the examination, the students are arranged in two classes,—those who have passed with credit and those who have simply passed. Rejected candidates must attend the next year's examination. Additional subjects of examination in mathematics are prescribed for those students who intend to be candidates for honours in mathematics, classics, or the natural or moral sciences; and no student is admitted to examination as a candidate for such honours who has not satisfactorily passed this additional examination. Every student must have completed nine terms' residence during two-thirds of each term, before he can take his B.A. The examination for B.A. is termed the "great go." and the candidates are called questionists. The examination of questionists who are not candidates for honours embraces the following subjects:—the Acts of the Apostles in the original Greek, one of the Greek and one of the Latin classics, history of the English Reformation, the first four and part of the sixth book of Euclid, together with such parts of alge-brs, mechanics, and hydrostatics as are prescribed by the schedule. The examination of candidates for mathe schedule. The examination of candidates for mathematical hopours, technically termed the "mathematical tripos," is confined to pure and mixed mathematics. It commences every year on the Tuesday after the 30th of December, or at the end of the tenth term. At the close of the examination the names of those who have most distinguished themselves are classed in three divisions; viz., wranglers, senior optimes, and junior optimes, which constitute the tripos, or three orders of honour. The highest of all is the senior wrangler for the year. "the greatest of English academical honours." The examination of those students who contend for honours in the classical tripos com-mences on the fourth Monday after the last Saturday of January in each year. The exumination consists of translations from English into Greek and Latin prose and verse; translations from the best Greek and Latin authors into English, and questions Greek and Latin authors into Engine, and pass this on ancient history. The names of those who pass this examination with credit are arranged in a tripos, and freet account, and third class. Two new triposes have recently been established for the moral and the natural sciences. The subjects for examination in the former of these, are moral and mental philosophy and logic, or history and political mental piniosophy and toge, or matory and political philosophy, political economy and jurisprudence; the subjects for examination in the latter, are chemistry, botany, geology, mineralogy, and zoology, with comparative automy and physiology. No student is to be admitted to these examinations (excepting candidates for degrees jure natalium) who has not passed the examination in the additional mathematical subpass with credit the examination; "and all who pass with credit the examination for either of these triposes are entitled to admission to the degree of B.A. A. B.A. may be admitted ad incipiendum in criticus at any time after three years from the comple-

tion of his bachelor's degree; the inceptors of as year becoming complete M.A. by creation on a "commencement-day." By the university statis-degrees may be conforred without residence or examdegrees may be conformed without repared that in stions on persons of certain rank or dignifications on persons of certain rank or dignifications of the certain rank of dignifications of the certain the admitted to the degree of B.D. for a degree the requisite exercises are one "sot" degree the requisite exercises are one and an English sermon. A D.D. must be a B.D. of years' standing, the exercises being one "act" and English sermon. The candidate for the degree of Las. is required to have kept nine terms at least, and to have passed the previous examination. The subj of examination are portions of the Roman civil law, the constitutional and general law of England, inter national law, and general jurisprudence. The names of those students who pass this examination with credit are arranged in three classes of honour. An L.B. may take the degree of M.L. by incepting, as in arts, at any time after the completion of three years from his in anguration. An L.M. of five years standing may presuggration. An l. M. of the years standing may pro-ceed to the degree of LI, D. after keeping an act. A student, before he can become an M.B., must have resided nine terms, and have passed the previous ex-sumination. Five years of medical study are required of candidates for this degree, except in the case of students who have graduated as B.A., when four years is deemed sufficient. There are two examinations, the first of which may be passed by the student after t first of which may be passed by the student after three years of medical study; the second, on the completion of his course. The subjects of the first examination are chemistry, botany, comparative and human anatomy and physiology, materia medica, and pharmacy and pathology; of the second examination, pathology and the practice of physic, clinical medicine, medical jurisprudence, and the medical treatment of surgical and obstetrica! diseases. All persons proceeding to the degree of M.D. are required to produce certificates of having been engaged in medical study during five years. The university also confers degrees of backletor and doctor of music, the conditions for either of which years. The inversity also contain degrees of which are the same; namely, that the candidate be a member of some college, and that he satisfy the professor of music as to his proficiency in the art, more especially by composing a solemn piece of music, to be performed at the appointment of the vice-chancellor, before the at the appointment of the vice-chancellor, before the university. Besides the honour of occupying a high place on the tripos list, the university-holds out to the ambitious student stimulants to exertiou, in the prizes which are annually submitted for competition. The principal of these are the Smith prizes, the chancellor's medals, and the university scholarships. The number of fellowships is 430, varying in value from £100 to £300; while some of the senior fellowships are of the value of £500 or more. For further information on matters connected with the university, we must refer to the Cambridge University Culeudar. The following is a list of the colleges, with the data. The following is a list of the colleges, with the date of their foundation, and number of members in 1870. A particular notice of each college will be found under ambabatical head :-

im mbambenen nea	, ,			
Colleges.	Founded.	Members of the Senate.	Under- graduates.	Members on the Board.
Trinity	1546	1,916	549	3,071
St. John's	1511	1,012	361	1,675
Caius	1348	338	113	583
Corpus Christi	1851	229	141	400
Emmanuel	1584	294	88	467
Christ's	1505	258	94	454
Trinity Hall	1350	138	114	389
Jesus		147	104	299
Clare		165	70	285
Queen's		165	51	269
St. Peter's	1257	153	59	245
Magdalene	1519	130	59	220
St. Catharine's	1473	121	42	203
Sidney	1598	82	57	191
Pembroke	1347	91	44	171
King's	1441	120	23	161
Downing	1800	50	33	101
Total		5,400	2,001	9,841

The average annual expense incurred by the student at one of the colleges is thus estimated, and the difference is not much at any of the other colleges :-

Laundress	. 5	- 8	0
Cost of living	. 20	12	6
College payments	5	7	4
Joals	8	10	0
astendance, assessed taxes, &	. 6	5	0
Looms, rent	. 10	0	0
fuition	. 18		0
	£.		

Total ...... £69 2 10

Oxumi, kam'-el (Lat. camelus) .- Of this gen. of mamraiferous ruminants there are two species, -1. the sommion camel (Camelus bactrianus); 2. the Arabian common camed (Cametus bactrianus); 2. the Arabian camed or Dromedary (Cametus Dromedarius). The first is principally distinguished by its humps being two in number, whilst the dromedary has but a single bump. The latter species is distributed over an immense extent of country, being found in Arabia, Persia, Southern Tartary, Rgypt, India, and the Canary Lalands. The common camed is not nearly so abundant, said its accorranged range much more limited. It and its geographical range much more limited. It is principally found north of the Taurus and the Himslays Mountains. The structure of the came is beautifully adapted to its various uses, and presents one of the most splendid pieces of nature's mechanism. Its percoral appearance is anything but fascinating, and, certainly, it would be more attractive on the score of cerriosity than admiration. Practically, however, the camel affords a good illustration of the truth of a cartain old proverb, implying that good looks are not always a proof of utility. The camel is distinguished from all other ruminants, except the liama, by having incisor teeth. The upper jaw contains sixteen teeth,two incisors, two canines, and twelve molars; the lower jaw, six incisors, two canines, and ten molars—eighteen The upper lip is swollen and divided, the nostrils sitt obliquely, the neck elongated, the head long, the eyes very prominent, and the ears somewhat small. The legs of the camel are long, weak-looking members, terminating with two hoofs or toes, padded with soft cushions underneath, which enable the animal to walk securely on the soft sands of the desert. The stomach of the camel is a curious construction, and enables the "Ship of the desert" to carry a supply of water wherewith it may refresh itself on its terribly long and tiresome journeys over immense tracts of parched and sandy desert, where, for days and weeks sometimes, not a drop of water is attainable. The hump is com-posed of gelatinous fat, which, by re-absorption, terniahes the animal with sustenance when the nature of the country, or any other unfortunate contingency, deprives it of a supply of food. Stored thus by the wise arrangement of Providence, with water and food, the animal may traverse in safety the most unproductive and arid country. So well is the nature of the tive and arid country. So well is the nature of the hump understood in the East, that the condition of the animal is judged of, and its improvement after a long journey measured by it. It is not uncommon to song journey measured by it. It is not uncommon to see camels come in after long and painful journeys with almost straight backs, the hump having almost entirely disappeared. The services of the camel to the wandering tribes of Arabs, and other inhabitants of the East, cannot be too highly appreciated, or, indeed, understood, by the people of civilized nations. The usual load of a caravan-camel is about five hundred-walcht. but, on extremely considered. reight; but, on extraordinary occasions, a strong and will carry a thousand pounds! It will travel that or nine miles an hour. The usual travelling eight or nine miles an hour. The usual traveling speed of a caravan is eighteen miles a day. The only part of Europe in which this animal is found is at Ples, in Tuscany. The date of the introduction of the camel at a beast of burden was not unknown to the camel as a beast of burden was not unknown to the camel as a beast of burden was not unknown to the camel as the camel; the three thousand of these animals to the camel; the three thousand of these animals are the camel; the three thousand of these names are the camel of the camel part of Europe in which this animal is found is at free part of Europe in which this animal is found is at free part of Europe in which this animal is found is at the small into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel as a beast of burden was not unknown to the samel as a beast of burden was not unknown to the samel into Europe is unknown to the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown to the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown. The usefulness of the samel into Europe is unknown to Euro

# Camellia

four or five thousand years ago. At what remets period the camel roamed at large, wild and free, is uncertain. The earliest writers make source mention of "wild camels;" and when they do so, it is not at all unlikely that allusion is made to animals which, on some occasion, have encaped from bondage, or been at free. The names of the camel in different countries. are all very similar. The Hebrew name is Gamai; it is the Djemal of the Arabs; Camelo of the Italians;

is the Djemai of the Arms; Camero of the Ribbans; in France, Chameau; in Germany, Kamel.

CAMEL (Fr. chameau), in Mar., a machine, chiefly used in Holland and Russia, for raising and carrying ships over any bars or banks that may obstruct the passage of a river. It was invented by Bakker, a burgomaster of Amsterdam, in the year 1688 or 1699. A came! is composed of two parts, the outsides of which are perpendicular, and the insides concave, shaped so as to embrace the hull of a ship on both sides. Each part has a small cabin, with sixteen snaped so as to embrace the fail of a simple ducies sides. Each part has a small cabin, with sixteen pumps, ten plugs, and twenty men. They have on deck also a large number of horizontal windlasses, from which ropes are fastened round the ship's hull. When they are used, the plugs are opened, and the water admitted until the camel sinks with the ship; all the ropes are then made loose, and the vessel is allowed to float between the two sides of the machine; on the ropes being tightened and the water pumped out, the camel rises, lifting the ship with it: both are then towed over the bar. This machine can raise a then towed over the bar. This machine can raise a ship eleven feet, or, in other words, make her draw eleven feet less water. Beckmann, in his "History of Inventions," states that the Dutch first contrived to carry their numerous fleet over the sands of the Zuyder Zee by means of large empty chests fastened to the bottom of each ship; and that this contrivance gave rise to the invention of the camel.

CAMBL'S HAIR is an article of commerce in the East, where it is much used for other purposes than those to which in other countries it is applied. The rough fabrics of the middle ages, called camelinum and camelitum, were woven of this material; and, during our own time, the Arabs make of it stuffs for carpets, tents, and wearing apparel. The Persians also apply it to similar purposes. The French manufacture hats from it. The fine hair from which artists' pencils are made is imported from Smyrna, Alexandria, and Constantinople, but it really comes from Persia. It is of three qualities—black, red, and grey, of which the best is the black. The grey is worth only half as

much as the red.

CAMELINA, kā-me-li-nā, in Bot., the Gold-of-plessure, a get. of cruciferous plants. C. fatida is sometimes found growing in fields of corn and flax in Britain. C. sativa, which is a common field-plant in France, has seeds containing much fixed oil.

CAMELLIA, ku-mel'-li-u (in honour of George Joseph Camellus, a traveller in Asia), in Bot., a gen. of plants belonging to the nat. ord. Terustramiaceae, natives of China, Japan, and the north of India, and extensively cultivated as greenhouse-shrubs throughout Europe and the States of America. The species C. japonica, which, as its name indicates, is a native of Japan, has received great attention from the florists of that country and of China from time immemorial. It has shining leaves, ovate elliptical, almost acuminate, and serrate; flowers without stalks, generally solitary, large, and rose-like. In its wild state the flowers are red; and the red single camellia is much prized by gardeners as a stock on which to graft the fine double varieties which have been developed by cultivation. Some of these varieties are of Chinese or Japanese origin; others have been raised in Britain, continental Europe, and America. Their colours are various, and the varieties differ much in the form and position

ensuring has fragrant flowers, which are said to be used in some parts of China for flavouring tess.

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CARTLINGER. (See TREUSTREHIAGER.)

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CARTLINGER. (See The Unit of the Land County, See The County, The County in the Last century, not only little known in this country, but its very existence was doubted; and somarvel, when wis ettraordinary proportions are considered. "Who can wonder at the incredibility of the people? 'I have seen an animal,' said the traveller, with the skin of a leopard, the head of a deer, a neck pliant and graceful is the swan's, so tall that three tall men, mounted on each other's shoulders, could no more than touch its each other's shoulders, could no more than touch its each other's shoulders, could no more than touch its forchead, and yet so gentle and timid withal, that the merest cur barking at its heels would put it to its utmost speed, which exceeds that of the hare or greyhound."—
(Wild Sports of the World.) These, moreover, are not all the wonders connected with the animal in question. What the elephant's proboscis is to it, as regards a grasper and a feeler, so is the camelopard's tongue to it, Its oblique and narrow nostrils are protected by a curious fringe of bristles, which it can at pleasure draw together, to the exclusion of the fine sand that the sufficating storms of the desert raise in clouds. Its full and lustrous syes are so wonderfully appointed, that, without moving its head, it can see behind, before, above; and thus defy the stealthy approach of its enemies. The legs of the camelopard have a curious, not to say awkward appearance. first impression one receives on regarding them, is that the hind ones are shorter than the fore. This is, however, illusory, and probably arises from the fact of the animal's neck stretching in a line with its back. In running, the hind legs are lifted alternately with the fore, and are carried outside and far beyond them, while the long tail, tufted at the end like that of the buffalo, is curled above the back, and swings pendulum-fashion exactly as the neck moves. From forehead to forehoof the full-grown buck measures eighteen feet, while the female, which is more slender than the male, measures about three feet less in height. Hundescribe the flesh of the camelopard as being slightly scented with the perfume of the mokanla and other flowering shrubs on which it feeds. Gordon Cumming, however, makes mention of a still more extraordinary circumstance,-that the living body of the animal emits a delicious perfume. "No pen, or words, convey to a sportsman what it is to ride into the midst of a troop of giraffes. They emit a powerful perfume, which, in the chase, comes hot on the face, reminding one of the smell of a hive of heather-honey in Soptember."—(Cumming, Five Fears in Southern Africa.) They congregate in herds of from twelve to twenty; though at times as many as thirty, and even

forty, have been seen in company.

CAMEO, kim'-e-o (Ital. cammeo).—When gems are cut
in relief, they are called cameos; but the term is generally given to small sculptures executed on those precious stones which have two layers of different colours. The exterior of these layers forms the relief, and the interior the background. Imitation cameos are also made from shells, some of which are exquisite works of art. The shells generally employed are the bull's-mouth, which give a pinkish-white relief, with an underlayer of red, resembling the sardonyx. The underlayer of red, resembling the sardonyx. The black-helmet gives a dark onyx ground, and the queen's-conch a deep pink. As these shells have tarse layers of colour, the tints required for the different figures and representations can be toned and Cameca are also made of artificial submodified. Cameos are and more of assume the stances, and glass was employed for this purpose by the ancients. The origin, however, of cutting cameos in precious stones is very remote. The art is supposed in precious stones is very remote. The art is supposed to have had its line in Asia: it was practised in Babylon, and was transferred thence into Egypt by the Phomicians. It was then carried on by the Greeks the Fucancians. It was ton carried on by the Greeks and Romans, who broughtit to great perfection. After the age of Praxiteles, the art of cameo-cutting became very popular in Greece. They were not only used for ornaments of dress, but were set in goblets, vases, lamps, &c. Antiquarians have not decided as to whether the gems commonly called Etruscan are Greek. Some drinking cups at that time were made out of a single stone, the outer surface forming one cameo. The Genzaga cameo, now in St. Petersburg, is said to be

the fincet specimen of the entique cameo in sti It represents two heads, supposed to be those of It represents two heads, supposed to be those of Pa-ciny and Rurydies. A cameo, representing Cupid as Psyche, in the Marlborough collection, is said as he is finest in Bugland. The Portland wase in the Briti-Museum is one of the most beautiful specimens of a ancient glass cameo. The manufacture of shell came is very recent. It originated in Rome in 1895, and, it to the year 1840, was almost entirely confined to itsel A large number of cameos are now made in Pari-thoy are act, as brooker wine to and over the case of the process of of the proces they are set as brooches, pins, &c., and much wors ornaments.

CAMERALISTICS, kām'-s-rill-is-tiks (Ital, com-ra, a chamber), is a term sometimes employed to fiesignuse the science of public finance, or that branch of political economy which comprises the means of raising and disposing of the public revenue.

CAMERA LUCIDA, kām'-s-rā loo'-s-dā (Itat., light chamber), an optical instrument intended to facilitate the nervenotics delivation of chiefs invented by The

chamber), an optical instrument intended to seminate the perspective delineation of objects, invented by Dr. Wollaston in 1807. In its original form, the examera consists of a four-sided prism of glass, set in a brasiframe, which is supported by an upright rod six or eight inches long, having at its lower end a sorest clamp for fixing it to the edge of a table. The upper The upper face of the prism, which is placed horizonfally, and that directed towards the object to be delinested, form a right angle, and the other two faces form as obtuse angle of 135°. The rays from the object, falling nearly perpendicularly on the first surface, enter the prism, and are totally reflected by the lower and back prism, and are totally renected by the lower saw cooks surfaces to the eye, so that the object appears in the direction of the drawing-board, or table, placed beneath the instrument. The eye is placed at the edge of the prism, so that the rays from the drawingpencil and paper may enter the pupil together with the reflected rays from the object. In this way the draughtsman obtains a faint image of the object on the paper, and if he be skilled in the use of the instrument, he may trace the outline of the object with extraordinary lidelity. A plate of metal, with a small aperture as an eye-hole, is placed at the edge of the prism under the eye, so that the reflected rays and those from the sketching-point form only very small pencils. By thus cutting off the unnerman. cessary rays, the difficulty of using the instrument is greatly diminished, for the eye is kept to one point. There are various improvements and modifications of the camera lucida, the best of which is that contrived by Signor Amici of Modena, in which a triangular prism is combined with a plate of glass having parallel surfaces. The camera lucida has been most successfully employed in delineating the forms of wonder and beauty revealed by the microscope, instrument used for this purpose resembles that commonly applied to landscape-drawing, but is provided with a fitting, which adapts it to the eye-piece of the microscope. The steel disc of Sommering is used microscope. microscope. The week and of commercing is used by many microscopic draughtsmen instead of the camers. This contrivance is a little disc of polished steel, placed at an angle of 45° with the eye-piace, so as to receive the magnified image of the object and reflect it upwards upon the retina of the observer. The disc is smaller than the aperture of the pupil, and the drawing-peucil can at the same time be seen very well as it traces the image apparently thrown down on the paper beneath. When either the camera or steel disc is used, the body of the microscope must, if possible, be placed horizontally.

CAMERA OBSUEA, kām'-e-rā obs-ku'-rā (Lat., dark chamber), an optical instrument for producing upon a screen the image of a field of view more or less extensive. It was invented by Baptista Porta in the 16th century. It has long been known as a familiar toy, in which form it consists of a rectangular box, furnished at one end with a convex lens, having a focal length equal to the length and depth of the box. Opposite the lens is placed a plane mirror inclined at an angle of 45°, which throws the image of any object to which the lens may be directed image or any object to which the sens may be directed on a plate of ground glass at the top of the box. The image thus formed may be traced on the rough surface of the glass by a black-lead pencil. The glass is shaded from the external light by a hinged lid having two side wings. Since the discovery of photography, the camera has become an important scientific instrument, and has

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Cancering shopted the title of the Reformed Presbyterian Church. When Charles II., after his restoration, attempted to establish episcopsey in Scotland, many of the inhabitants of that country held that he had broken faith with the ation, and had forfeited all claim to their obedience. Some of the more prominent of these were persecuted and imprisoned, and not a few of them suffered marsmo imprisoned, and not a few of team same that they by dom. Bichard Cameron and about twenty others publicly issued a declaration at Sanquhar, and affixed it to the market cross, as a protest against the king and his government. Some weeks afterwards, the party was surprised by a vastly superior force in Airdsmoss, on the confines of the counties of Ayr and Dumfries. After a brave fight, Cameron and his brother were causer a prave ngnt, Cameron and his brother were sains, and sixteen others were taken prisoners, and soon after perished on the scaffold. Their principles, however, continued to gain ground, and in 1681 they organized themselves into various societies, maintaining close correspondence with each other. They still continued the objects of the most ruthless persecution. They were proscribed and hunted like wild beasts by the government, no respect being shown to either age or sex, while numbers of them perished on the scaffold or at the stake. Their leader, James Renwick, who was beheaded in 1888, was the last of the Scottish The Revolution, which occurred soon after, martyrs. The Kevolution, which occurred soon anter, put an end to their persecutions for conscience sake. They were among the first in Scotland to take up arms in the cause of the prince of Orange, in which they rendered important services, and were "the first men in Scotland that petitioned the Convention of Estates arms of Scotland on the head of their deliverer, king William." After the Revolution, and principally on account of the control exercised by the principally on account of the control exercised by the state in church matters, they were unwilling to unite with the church as then established in Scotland, and they remained a distinct body. They were never very numerous, and after this time they sank into a comparatively obscure sect. They did not form themselves into a regular church till 1743, when, under the direction of the Rev. John McMillau, who had joined them from the established church, they "formed and established a prebytery in the name of Christ, the alone king and head of the Church, under the title of the Reformed Presbytery." After this time they increased in numbers, and in 1811 a synod was constituted, under which there are six presbyteries, with 36 ministers and 45 there are six presbyteries, with 36 ministers and 45 congregations. The entire number of members is estimated at about 6,000. They have a theological hall, with professorships of systematical theology, and bib-lical literature and church bistory. The standards of the church are the Westmaster Confession of Faith, the larger and shorter catechisms, and a "Testimony," authorized and issued by the synod in 1839.

CAMERONIAMS, or CAMERONITES, the name also of Cavinists in France, so called from their foundar, John Cameron, a learned theologian, born nt Chasgow in 1579, and afterwards professor at Bordesux, Sedan, and Saumur. They asserted that the will of man is only determined by the practical independ of the mind, and that divine grace moves the will through the light imparted to the judgment. The rigid adherents to the synod of Dort were the rigid adherents to the synod of Dort were the rigid adherents to the synod of Dort were the rigid adherents to the synod of Dort were the rigid adherents to the synod of Dort were the rigid adherents to the synod of Dort were the rigid adherent them, and the controversy was arried or with great seal and subtlety on both sides, the camp was laid out round this spot. It was in the form of a square, and the length of each side the synonymetric product of the position of the position of the rigid adherent synonymetric products and the camp was laid out round this spot. It was in

whether the will of man is determined by God in diately, or mediately by the intervention of knowledge which he imparts to the mind.

CAMBARDS, kime-sards', the name given to the Pro-testant insurgents in the Covennes, who, after the revocation of the edict of Nantes, in 1685, being sub-jected to great persecutions, took up arms in their own defence, and for a time reprised upon their persecutors with equal cruelties. The name is said to be derived from comise, or chemise, a shirt, because, when making their nocturnal attacks, they usually wore a kind of shirt over their clothes, in order to distinguish each smir over their clothes, in order to distinguish each other; hence camisade signifies a nocturnal attack. After seventeen years of suffering, they at length, in July, 1702, took up arms in their own defence, and, incensed by the speeches and prophecies of some among them who pretended to be inspired, their seal rose to fanaticism. Severe measures were adopted against them; their villages were burned and their prisoners butchered; and they, in turn, pillaged and burned the Catholio villages, sacked the churches, and massacred the priests. Marshal Villare having, in 1704, succeeded the Marshal de Montrevel, who was first sent out against them, tried pacific instead of harsh measures, and by persuasion and promises induced many of them to lay down their arms; among whom was Jean Cavalier, the ablest and most popular of their leaders. This remarkable man, originally a journeyman baker, afterwards came to England, where he was favourably received, and rose to be a general in the army and governor of Jersey. The recusant Camisards continued in arms for some time; but, being much reduced in strength, their attacks were being much reduced in strength, their attacks were less frequent, and on a much smaller scale, and by degrees hostilities ceased. A subsequent rising took place in the Vivaraia, a part of the Cevennes country, in 1709, which, after a vigorous resistance, was subdued. A work on the Camisards has recently been published by Ernest Alby (Paris, 1835).

CAMLER, käw'det (from camel), was the name originally given to a fine cloth made from the hair of the Angora goat. The British camlets are, however, entirely made of sheep's wool, or a mixture of wool with linen or cotton, and spun very hard.

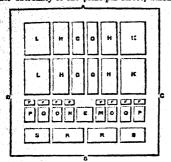
entirely made of sheep's wool, or a mixture of wool with line or cotton, and spun very hard.

Camomile, or Chamomile. (See Anthemis.)

Camourler, kām-oo-flai.—In Mil., when sappers and miners have driven a gallery close to any part of the works of a besieged town, a countermine is some times made by the besieged, charged with a composition so called, the explosion of which destroys the works of the attacking party, and kills or injures the men em-ployed in the trenches with its intolerable and suffocating odour.

CAMP, kamp (Lat. campus, a level plain), the name applied to any collection of tents or huts in which soldiers are temporarily lodged in time of war, or to buildings of more lasting character; as the camps at Aldershot and the Currugh. The children of Israel are spoken of in Numbers ii. as pitching their camp, according to their tribes, round the tabernacle in the wilderness; and this is the first mention of a military encampment in history. The Romans paid great attention to the formation of their camps. Wherever tention to the formation of their camps. Wherever the army remained, if only for a single night, a trench was dug, and a rampart thrown up round it for its was dug, and a rampart thrown up round it for its protection. They were acoustomed to make two different kinds of camps,—one for the summer easson, when troops were on the march, and the other for soldiers in winter quarters. They were slike in principles of construction, but, while the summer camps were larger in size, being intended for the accommodation or an entire consular army, the winter camps were more strongly fortified. When a Roman army was on the march, some centurions, with a military tribune, were usually sent on before the main body to choose a site and mark out a camp for the encampment of the army for the ensuing night, or for a longer period, as it might happen, The ground chosen was generally as level as possible, and on elevated ground, from which the whole of the

# was about 2,080 English feet, when it was intended to secondare an entire consular army, which consisted of two Bonan legions, each of 4,200 foot-soldiers and 500 cavalry, and 10,500 infantry and 1,800 cavalry of allied or suxiliary troops, of which 2,100 infantry and 600 eavalry formed what were termed the extraordinary or picked troops of the alines, who acted as part of the general's body-guard; making the total force under arms about 25,000 men, including officers. There was a gate in each side of the square; namely the Printerian gate (A), in the front of the camp, the Decumn (n) in the rear, and the principal gates (C, D) at sither extremity of the principal street, which ran



BOMAN CAMP.

through the camp in front of the Prætorium (E), and was 100 feet in width. The tents of the tribunes, who held the chief commands in the Roman legions, and the prefects, who were possessed of equal authority the prefects, who were possessed of equal authority among the auxiliary troops, were placed along the principal street on either side of the general's quarters, but slightly in advance. A road 50 feet in breadth ran from the Pretorium to the Pretorian gate, crossed about midway, at right angles, by another called the Via Quintana. On either side of the passage to the Prætorian gate, the Roman cavalry were posted (G, G), and with them the Triarii, a division of the Roman interest fantry. (See ARMY.) Other passages of fifty feet inter-vened between the tents of these troops and those of vened between the tents of these troops and those of the rest of the Roman infantry  $(\mathbf{n}, \mathbf{n})$ , and also between these and the cavalry and infantry of the allies, part of which were placed on the right wing of the army  $(\mathbf{x})$  and part on the left wing  $(\mathbf{n})$ . On the right of the Præstorium were the quarters of the quæstor  $(\mathbf{M})$ , who acted as the chief of the commissariat department; on the left, the forum (N), or market. On either side of the questor's quarters and the market were placed the tents of the auxiliary cavalry (0,0) and infantry (r, r), that formed the consul's body-guard, separated by the quarters of volunteer troops, consisting of men of rank and station, who had accompanied the army out of friendship towards the general. In the rear of these of triendship towards the general. In the rear of these quarters and the Prætorium were placed the remainder of the chosen or extraordinary auxiliary troops (z, z), while the remaining space (s, s) was occupied by any friendly troops that might be attached to the army for a short time. Between the inner square thus occupied by the encampment and the rampart, an open space, 200 feet in width, intervened. The vallum, or rampart, was made of turf and earth taken out of the forea, or ditch, surmounted and strengthened by a row of stakes or palisades. The ditch itself was generally from twelve to lifteen feet wide and nine or ten rally from twenty to interest feet deep. In consequence of the arrangement above described being always adhered to, with certain necessary modifications, when required, according to circumstances, the troops composing a Roman army always knew the position they were to occupy; and as the camp was always marked out before the arrival of the main body, each cohort repaired to its quarters as ans main body, each conort repaired to its quarters as it came up, and immediately proceeded to construct that part of the rampart and ditch which full to its share. Regular watch and ward was kept during day and night, and the guards were relieved every three hours. There are many remains of Roman camps in Great Britain; and all towns the names of which end

# Campaign

in "obseter," a corruption of the Latin create, a canch as Manchester, Colchester, Windhester, Ec, been built on the sites of Roman emangements or tary towns, from which they have derived their as The remains of the Danish camps in this country those which are considered to be Danish, indicate they were circular in form, and sometimes constri with more than one line of defence. The tenus encampments of the Saxons and Danes were fortif with barricades composed of trees, with the branch cut, to present the form of projecting stakes, and son times with a rampart of earth and stones. The Briton times with a rampart of earth and stones. Let breaking protected their villages in a similar manner. The Gauls and ancient Germans surrounded themselves with their waggons and chariots, disposed in the forms of a circle, and strengthened by barricades of trees and branches. With regard to the disposition of and branches. With regard to the disposition of troops in these circular inclosures, it is known that the Saxons pitched the tent of their chief in the centre, and the cavalry were grouped immediately round it, while the infantry occupied the remaining space is tween the cavalry and the defensive barriers. Prior to the use of cannon, in the time of the Norman and early Plantagenet kings, it is supposed that English armies were encamped in the field on a plan similar in general principles to that adopted by the Romans, the ground being marked out and a position assigned to each eing marked out and a position assigned to each oeing marked out and a position assigned to each division. When an army was besieging a town, the camp was protected by fortifications to guard against surprise, and when cannon were introduced, redoubts were added at various points of the line of defences. But the practice of grouping the tents or huts in the form of a square or circle has been abandoned for some two centuries or more, to avoid exposing the army to the fire of the enemy in one mass; and it is now con-sidered better to place the tents along an extended front. sidered better to place the tents along an extended front, each regiment occupying the position it would take if the army were drawn up in order of battle (see Lines of INTLENCHMENT), and the tents not showing a greater extent in front than the regiment would occupy when drawn up two deep. A battalion 1,000 strong would therefore require a space in front of 875 feet for the extent of the line of tents, as it would occupy this space when drawn up in file. A regiment of cavalry of the direct proposition of eight troops of eights. space when drawn up in life. A regiment of cavalry drawn up two deep, consisting of eight troops of eighty men each, would occupy a front of 960 feet. The tents for the infantry are placed in two rows parallel to the front; the tents of the captains and subalterus occupy another line; and the tents of the field-officers, the sutler's tent, and the field-officers' horses, are grouned sutler's tent, and the field-officers' horses, are grouped behind these. The tents of the quarter-guard are placed about 250 feet to the front, in the centre of the battalion, and the tents of the rear-guard are pitched about fifty feet to the rear of the antier's tent. The regiment parades in front of the first line of tents, between these and the tents of the quarter-guard. between these and the tents of the quarter-guard. As somewhat similar arrangement is adopted for cavalry; but the tents of the privates are pitched in lines perpendicular to the front, instead of being parallel to its as for infantry, and the horses are picketed between them. When an army is encamped, the infantry is generally disposed in the centre in two lines, with the reserve occupying another line in the rear; the cavalry is placed on aither side and the arrillary is placed. is placed on either side, and the artillery is placed on the flanks with the cavalry, or in the rear. encompment is formed, great attention is always paid to the position of the ground around it, and all approaches are fortified against attack by redoubts and intrenchments. Advanced guards are also throws out all round, to guard against surprise or sudden attack. Any good plan of the disposition of the British and French forces before Sebastopol, showing the nature of the ground and the position of the redoubts that defended the approaches, will give the reader the best idea of the arrangement of a modern camp, which must always be governed by the nature

camp, which must always be governed by the nature of the surrounding country.

CAMPAIGN, kim-pain (Fr. campagne, Ital. campagne, an open plain), a term applied in the present day to a series of operations in warfare, by which any important end is achieved. It was formerly taken to mean that which was done by an army between the time that it winter-quarters if active operations in the field during the summer months, until it entered them again. During this time the soldiers were under can-

s or without shelter in the open field; and hence

the name.

The name.

This camp, and the comp
state Curragh of Kudare, in Ireland, are permanent
earing, intended for the instruction of officers and
soldiers in military acience and operations in the field,
and to teach them how armies, divisions, and brigades
are handled in warfare, forming, in fact, practical
military schools on a large scale. For this purpose
the country round Aldershot is well stapted, being
composed of moorland, heath, and common, unfit for
stalivation, but admirably well suited for sham fights
and the construction of siege works and intrench
ments. The heath, which was purchased by government in 1854 for about £130,000, has an area of rather
more than 7,000 acres. The situation presents advantages of a peculiar nature in being near the London
and South-Western and South-Eastern railways, which
senders it convenient for the dispatch of troops to renders it convenient for the dispatch of troops to the southern shores of England at very short notice, should occasion ever require it. The camp was imme-diately laid out and drained, and roads formed; blocks of wooden hats were also constructed for the reception of the soldiers, which have since been replaced by brick berracks replete with every convenience, at a cost of more than £250,000, forming the finest barracks in the world. The buildings form two long lines, with a paradeground between them, the infantry and artillery occupring what is called the North Camp, and the cavalry the South Camp. The barracks are disposed in the form of blocks, or quadrangles, with a courtyard in the centre, each block affording accommodation for an entire regiment, and containing sleeping-rooms, each for twenty-four men, washing-rooms, mess-rooms, school-rooms, kitchens, and the necessary offices, with separate spartments for the sergeants and married soldiers. The officers' barracks and mess-rooms are situated in the spaces that intercene between the blocks. The sleeping-rooms have balconies attached, from which the men gain a view of the surrounding country and parade-grounds. Drill-grounds, covered in with glass, have been made, and suitable play-grounds, in different parts of the camp. Stables, and sheds for guns and stores, are attached to the artiflery and cavalry barracks. Lectures and amateur theatrical performances are given for the instruction and amusement of the men, and the only requisites to be added for the soldier's recreation are those of soldiers' alub-houses and gardens, to counteract the ill effects of beer-houses and other places of demoralization that abound in the neighbourhood.

CAMP EQUIPAGE, a term under which are included all necessary articles for the use of the soldier in the field, such as tents, tent furniture, and cooking uten-Both officers and men are restricted to a certain equantity of camp equipage, that the army may move from place to place with as little incumbrance as possible. (See Text.) The camp equipage of an army on the march in India exceeds that of all others, on account of the peculiar requirements of the eastern climate and the numbers of non-combatants that move with it. (See CAMP-FOLLOWERS.)

CAMP-FOLLOWERS, the name given to the sutlers and men and women who deal in trifling commodities, and follow an army on the march. In India there are often as many as five camp-followers for every officer sad soldier in the army. When in the field they are subject to the Articles of War. They prove of some utility in a battle for the purpose of conveying the wounded to the rear, or by assisting to do so; but the majority of them, the women especially, my for the sake of plundering the slain, often killing e wounded after nightfall, for the sake of the stebes, money, and jewellery that they may have out them. They will often purchase valuable articles shout them. They will often purchase valuable articles from the soldiers for small sums of money, and many here been known to acquire considerable wealth by

Care-Maxings are religious festivals held among Methodists in some parts of England and the United Bates of America. In the latter country, Presbyterians also, particularly in the back settlements, have their camp-meetings. In America, on these occa-sions, the people assemble from great distances, some

in waggons, others on horseback, sometimes to the number of 15,000 or 20,000. They bring their provi-sions with them, and, arecting booths, they dovote a to reight days to religious exercises. Besides prayerdaily during the festival, and the Lord's Supper is celebrated on the Sunday. In Mrs. Stowe's "lived" there is an account of an extraordinary camp-meeting. Among the Methodists of England the camp-meeting

only lasts for one day.

Campanile, kam'-pa-nue (Ital. campana, a bell), the
Italian name for a beliry or bell-tower, and thence applied in Arch, to any part of a nuturing the rest in the form of a square tower. The campanile differs from the English bell-tower in being denied differs from the English bell-tower in being denied in the belongs. There plied in Arch, to any part of a building that rises above tached from the building to which it belongs. are some good examples in modern English church architecture, the best of which will be found at Wilton, in Wiltshire, appended to the Byzantine church built by Lord Herbert of Lea. In domestic architecture, in which will be the control of the co ture the campanile usually rises over the entrance, terminating in a room of small size at the top, which often answers the purpose of a belvidere. (See Bri-Otten answers the purpose of a belvidere. (See BEL-NTBER.) The chimney-shafts of engine-houses are often built in this style. It is a distinctive feature of Italian architecture, and is found in Byzantine archi-tecture of the third period (see BYZANTINE ARCHI-TECTURE), as exemplified in that attached to the church of St. Mark at Venice. They are generally square in form, without buttresses, and of the same dimensions from top to bettom. The leaning tower of Pisa is, however, an example of the circular campanile. It was bogun in 1174 by Bounanus of Piss and William of Innspruck. It is 178 feet high, 50 feet in diameter: the summit is reached by 330 steps. The reason of was begun in 174 by hounants of riss and winds in finispruck. It is 178 feet high, 50 feet in diameter: the summit is reached by 330 stops. The reason of its being termed the leaning tower arises from the fact of its leaning 13 feet from the perpendicular. Among those which are to be seen in almost every Italian town, the campaniles at Cremona and Florence are most worthy of notice, the former for its great height (395 feet) and the latter for the great beauty of its design and execution. It was built by Giotto in 1334, and is 209 feet high, occupying an area of 45 feet square. The exterior is coated with slabs of coloured marble. It was the intention of the architect to have placed a spire on the top, but his design has never been carried out. There is a good campanile, \$50 feet high, attached to the cathedral of Seculle, built at the close of the 12th century, now caited La Giralda, from an enormous weathercock, a ton and a half in weight, cast in bronze, which was put up in 1565. It represents a female figure. female figure.

CAMPANILA, kām-pān'-u-lā (Lat., a little bell), in Bot., the Bell-flower, a gen. of plants forming the type of the nat. ord. Campanilacea. It includes several British spacies, which are known to all lovers of wild flowers; thus, C. rotuniifolia is the hare-bell; C. giomerata, the clustered bell-flower; and C. Rapunculus, the rampion. The roots of the latter species

are eaten in some parts.

CAMPANULACEA, kam-pan-u-lai-se-r, in Bot., a nat. ord. of dicotyledonous plants in the sub-class Corolli-flora, consisting of herbs, or undershrubs, with the following characters :- Leaves nearly always alternate, exatipulate; calyx superior, persistent; corolla monopetalous, regular; stamens equal in number to the lobes of the corolla, with which they are alternate: anthere 2-celled, distinct, or partly united; fruit err, capsular, opening by lateral fissures or valves at the top, many-seeded; seeds with fleshy albumen. There are 29 genera and 500 species, chiefly natives of the temperate parts of the northern hemisphere.

comperate parts of the northern hemisphere.

Campanularia, Campanularia, kām-pāgu-lai'-ria, a gen and fam of zoophytes. This division is thus characterized by Dr. Johnson:—"Palypedom plant-like, horny, rooted by a creeping tubular
fibre, branched or simple; the polypes cell this and
campanulate, terminal, elevated on a ringed footstalk
disposed either alternately or irregular." The above authority also mentions having seen the auteoms of a crab so completely invested with this zoophyte as to resemble hairy bruskes, the coralline in this instance having chosen a station by which it obtained all the hearlist of locametrics. benefits of locomotion.

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CAMPBRILITIES, OF DESCIPLES OF CREIFF, Rawbel-ites, an American sect of Baptists founded by
Alexander Campbell, a Bootchman, who left the Pressysterian church in 1812. He became united with a
Baptist association, but, protesting against all human
creeds as a lond of union, and declaring that the
Bible slone ought to be accepted as the rule of faith
and practice, he was excluded from the fellowship of
the Baptists in 1827. His followers formed themselves
into a separate body, and in 1833 were supposed to
number 100,000 souls. In 1841 Mr. Campbell founded
a college at Bethany, in Virginia, which is attended by
about 150 students. The sect at present is supposed
to number about 150,000 persons, principally in the
states of Virginia, Tennessee, and Kentucky.
Camphene, a

CAMPHENE, CAMPHILINE, or DADYL, kim'-pheen, a product obtained from turpentine by acting on that body with hydrochloric acid. Hydrochlorate of camphene is formed, which is transformed into camphene by the abstraction of the hydrochloric acid by the aid

of quicklime.

CAMPHINE, kom-pheen', a name applied commercially to a pure variety of oil of turpentine which is said to be furnished by the Pinus australis of the

southern states of America.

CAMPROGENS, kim'-fo-jens, a series of hydrocarbons, which, when treated with hydrochloric acid, form artificial camphor or terebenes. They include oil of turpeatine, oil of lemons, oil of rue, and one or two

others.

CAMPROE, kām'-for (Gr. kamphogen, Arab. kaphoor), a solid crystalline substance found in many plants, though only obtained in large quantities from two; namely, Camonly outsined in large quantities from two; namely, Camphora officinarum and Dryobalanops aromatica. The former, an evergreen tree growing in China, Formosa, and Japan, yields almost all the camphor of European comerce. The camphor, which may be regarded as a solid volatile oil, is diffused through the entire plant, and is separated from the root, trunk, and brunches. These parts are out into chips, and boiled in water till the camphor begins to adhere to the stirring-rod, when the liquid is strained and allowed to stand until the complor concretes. It is then sublimed into inverted straw cones contained within the carthen capitals of the stills. Vast quantities of this crude camphor are procured from the province of Fokien, in China, and the opposite island of Formosa; but some of good quality exported from Japan. It is generally in small grey ish, slightly sparkling grains, which, by aggregation, form crumbling cakes. Refined camphor is prepared by mixing the crude product with line, and subliming it into thin glass ressels of a peculiar shape, which are afterwards cracked so as to obtain the camphor in concavo-convex cakes, each about three inches thick, with a hole in the middle. Camphor is colourless and transa hole in the middle. Campior is colouriess and trans-lacent, and has a strong, penetrating, aromatic odour, and a bitter, rather pungent taste, though leaving a sensation of coolness in the mouth. Its specific gra-rity is from '98 to '99; so that it floats upon water, and, evaporating while doing so, undergoes a curious rotatory movement. It rolatilizes slowly at ordinary temperatures, melts at 288° Fahr., boils at 400°, and burns with a bright flame. It is soluble in alcohol, ether, oils, and dilute acids; also to a certain extent in water. The Sumatra or Borneo camphor is the produce of Dryobalanops aromatica. It greatly resem-bles the ordinary camphor, but is never seen in Euro-pean commerce, because the Chinese give a price for it eighty or a hundred times greater than that at which they sell their own camphor. It does not appear, however, that the Sumatra camphor is in any way preferable to that of Chins. The same tree which affords this rare substance yields also a pale yellowish Impid fluid, called diguid camphor, or cumphor oil. Artificial camphor, closely resembling the natural product, many be formed by acting upon oil of turpentine with bydrochloric acid. It differs from true camphor in burning with a sooty flame, and in giving off, when mention, no donor of carpetonic. Campute is used in medicine, both internally and externally, as a temporary stimulant. In moderate doses, it will allay nervous triffaction and produce quietude and placidity of feeling. In very large doses it acts as # narcotic, and is said to be poisonous. Raspail, the founder of a peculiar system of medicine widely adouted in France, alevates wen of medicine widely adopted in France, elevates

camphor almost to the dignity of suniversal medicine. The alcoholic solution of camphor and liniments, of which it is the principal ingredient, are much used for external application in sprains and bruises, chilblains, and chronic rheumatism. Insects are kept from attacking specimens of natural history by placing places of camphor in the cases in which such specimens are preserved. Chemically considered, camphor is a compound of carbon, hydrogen, and oxygen, in the provotions avpressed by the fewards of

portions expressed by the formula  $C_{10}H_{\bullet}O$ .

Campriora, kinn-fo'-ra, in Bot., a gen. of plants belonging to the nat. ord. Lauraces. The most interesting species is C. officinarum, the camphoratese, a native of China, Formosa, and Japan, where it grows to a considerable size. It is an evergreen, and all parts emit a champhoraceous odour when bruised. The wood is white, light, and durable, and is much used in China for carpenter's work. From the roots, trunk, and branches of this plant, the common, or

parts emit a champhoraceous odour when bruised. The wood is white, light, and durable, and is much used in China for carpenter's work. From the roots, trunk, and branches of this plant, the common, or officinal camphor, is obtained. (See CAMPROS.)
CAMPHORIO ACID, kām for ik; is formed when camphor is acted on by concentrated mitric said. It crystallizes in lamellar or accounter crystals, which have a bitterish sour taste. They melt at 138° Fahrand dissolve slightly in water. Camphoric soid forms salts with the various bases.

salts with the various bases.

Camphenene, kam'-frome, a liquid formed by passing the vapour of camphor over red-hot lime.

Campion. (See Silkne.)

CAMPYLOSPERME, küm-pi-los-per-me (Gr. kampules, a curve; sperma, seed), in Bot., a sub-ord. of the Umbellifera, characterized by the alloumen of the seed being rolled inwards at the edges, so as to present a

vertical furrow on its face.

CANAILIE, kin-tle' (Lat. canis, a dog), is a French term sometimes used in this country, and signifying the lowest class of the people,—the rabble. Formerly, before the revolution in France, this word was applied by the nobility to all who were not of their own-rank; and afterwards the people themselves adopted it in contempt of the aristocracy, when it came to lose its offensive signification. At present, the French sp-ply the term only to such as have been guilty of some ase act. Of one who has degraded himself, whatever

his rank, they say, "C'est une canaille."
CAMWOOD. (See BAPHIA.)

CANAL, kān-āl' (Lat. canalis, a water-course), an artificial water-course made for the purpose of facilitating communication and the carriage of coals, bricks, and heavy goods, from a seaport to any inland town, or from one inland town to another. Some are broad and deep enough to admit of the passage of vessels of considerable tonnage, in which case they are termed "ship canals:" others are but limited in length, and merely intended to allow barges and small vessels to pass from one part of a navigable river to another, and thereby to avoid any shallows or irregularity in its course that tend to obstruct navigation, or to cut of "any bend of considerable extent;—these are called "lateral canals." Canals cut for the purpose of allowing the passage of boats from one river to another, each supplied by a different watershed, such as the Canal du Centre in France, are called "summit-level canals." All the great nations mentioned in the early history of the world were in the habit of constructing canals for promoting inland navigation. Remains of engineering works of this nature of considerable extent are to be found in India, Egypt, and the plains of Assyria, watered by the Tigris and Euphrates. The canals of the Chinese are of great length, the Great or Imperial canal, by which Pekin is supplied with rice, and the various productions of the provinces that lie to the south of it, is 700 miles long. It was not untall to have been introduced by Leonardo da Vinci in the construction of a canal near Milan. Up to that time and the construction of a canal near Milan. Up to that time and had merely been long lines of water of the same level throughout; but the contrivance known as the "look" allowed them to be many feet above the level of that next to the river or estuary with which it communicated, and admitted their construction of the last inland reach of any canal might be many feet above the level plains. In Holland, canals take the place of roads

real message; but the extreme fishness of the readers the use of the look less requisite than m parse of Europe. The first causi of any importance made in France was the Canal de Briere, which unites the rivers Loure and Seine, which was completed in 1642; but the greatest engineering work of this kind ever attempted in that country is the Southern senal, or canal of Languedoc, which connects the Mediterranean with the Atlantic Ocean, and allows the Mactiterranean with the Atlantic Ocean, and shows vessels of 100 tons burden to pass along its entire length. It is nearly 150 miles long, with upwards of 100 locks. It is carried over many valleys by means of adjudgments, and is 600 feet above the level of the sea in its highest part. This great undertaking was finished in 1661. In England, the construction of canals did not commence until the middle of the 16th century, igh the New River canal had been cut and complaced by the year 1614, and the Thames made navigable as far as Oxford a lew years later. Among the principal English canais may be mentioned the Bridge-water smal, constructed by Mr. Brindley for the duke of Bridgewater, commenced in 1758, and the Grand Junction canal, completed 1790, which communicates with several others, and affords inland communication between the ports of London, Bristol, Liverpool, and Hull, by the various capals and rivers with which it is connected. In America, the Great Eric canal, 363 miles long, is one of the most famous; and the Welland canal, which connects Lake Eric with Lake Ontario, and ena-bles reseals to pass from one lake to the other, which the Falls of Niagara would otherwise prevent. The Ganges canal, in India, cut for the purpose of watering the land between the Ganges and the Jumna, is the largest in the world; it is 900 miles in length, and, when com-pleted, will have cost upwards of £1,500,000. In late years schemes have been introduced for uniting the Atlantic and Pacific oceans by a ship canal across the Isthmus of Panama, and for cutting a canal through the Isthmus of Suez, to allow vessels en route for India to pass from the Mediterranean Sea to the Red Sea. M. de Lesseps, the projector and engineer of the last-named canal, commenced operations some years since, and his great undertaking was completed in 1869. In constructing the Suez ship canal, the Object sought was to unite the Mediterranean with of some thousands of miles which vessels proceeding to India or Polynesia are compelled to make. to inma or Polynessa are compelled to make. The Ishmus of Suez is a sandy valley some hundred miles in extent, more than half of it being in its natural state under water. Lake Menzaleh extends inland from Port Said, on the Mediterranean, for upwards of 30 miles; Lake Ballah extends for 10 miles; Lake Timesh and the Bitter Lakes have an extent of about 60 miles. There were thus only about thirty miles of excavations to be carried out. From Mr. Hawkshaw's report to the Egyptian government, we learn that the the to be performed upon the principal canal was as follows:—Commencing at Suez, a channel had to be dredged in sufficiently deep water. The mouth of this channel terminates to the southward of the entrance to the basin and graving-dock, constructed for the railway and steam-packet traffic. The portion dredged raiway and steam-packet trailic. The portion dredged averages 16½ feet deep. Between the upper edge of this dredged channel and the Bitter Lakes is a distance of 12½ miles, and the canal between these points is whelly in excavation, varying from 29½ feet to 55½ feet in depth. The canal traverses the Bitter Lakes for about 25 miles. It is next carried on to Lake Timash an agent. In a casal reverses the Bitter Lakes for about 23 miles. It is next carried on to Lake Timesh through an excavation 8 miles in length, the cutting through this distance varying from 294 feet to 62 feet in depth. It traverses Lake Timesh for a distance of 22 miles, the excavation at this point averaging about 25 feet in depth. At El Guier, which lies between Lake Timesh and Lake Ballah -- a distance of 112 miles, the canal enters the highest ground. The depth of the capting between these two lakes varies from 293 feet to 35 feet. From Lake Ballah to Lake Menzaleh, a distance of 21 miles, the excavation averages 294 feet. The canal then passes through Lake Menzaleh, and processes to Port Said, a distance of 20 miles, the excavations averaging at this part about 25 feet in depth. Port Said consists of a basin 375 wards square, and of an exestern and western stone jetty extending into the sea. The eastern jetty is a line work, 3,609

yards long from the covet-line, and the western je 2,515 yards long, the distance between the two bei 437 yards. The canal between flues and the Bits Lakes was originally intended to be 328 feet wide, and between these lakes and the Mediterranean 2622 wide. The width between the zwo latter prints was afterwards reduced to 190 feet. The width between the Bitter Lakes and Suez was also much reduced. The length of the canal from sea to sea is about 90 The cost of the undertaking was originally asti mated at £8,000,000; but as much more was required before the undertaking was half accomplished. only the harbour of Port Said, but the principal por-tion of the canal itself, had to be constructed by dredging; and this, in soft ground or through the aludge of Lake Menzalch, was sufficiently easy work. It was carried out in this way : the mud raised from the bottom was spread along each margin of the newly-scooped channel; but it would not remain there, and for a time the prospect of maintaining an open way seemed as hopeless as George Stephenson's open way seemed as noperes as usorge suspensions wifers attempt to carry the Liverpool and Manchester railway across Chat Moss. No scoper was the Menzaleh mud deposited in its new position, than it either slipped back into its former bed or squeezed the soft soil on which it lay into the channel. It was clear that if some means of getting over this difficulty were not discovered the Sacre Court and the same has the source of the source of the source of the same has the not discovered, the Suez Canal could never be com-pleted. It is said that a labourer one day hit upon a plan which saved the undertaking from failure. He showed that if, instead of laying the mud in great heaps, a thin layer were spread and left to herden in the aun, it would not alip back. Mr. Robert Stephenson, as well as other celebrated English engineers, held the opinion that the canal could not prove otherwise than a failure. Be this as it may, the canal is at the present moment completed, and perfectly open for ships; but whether or not it can be kept in proper working order, time alone can prove. An eminent writer states in Nature, that, in his opinion, the work will really endure. He says,—"Since the Suez Canal was first projected, engineering acience has advanced; and though the sands will accumulate at Port Said as from old, the piers and breakwaters will be periodically lengthened, - made to stretch further and further into the sea, while powerful steam-dredges will scrape away the sand from the mouth of the harbour. Whether heavy gales will effect any more serious choking of the approaches, or drift tons of blowing sand into the canal itself, remains to be seen." new route to the East makes the voyage to India eight thousand miles instead of the fifteen thousand by the old route round the Cape of Good Hope. Ship canals are generally short in length, being intended for the passage of vessels from the coast to towns situated at a short distance from it, or from one sea to another. Among the most notable of this description met by North Holland small between the Westlemann of the Cape of the to another. Among the most notable of this description are the North Holland canal, between the Holder and Amsterdam, and the Caledonian canal, between the North Sea and the Atlantic, connecting Beauly Firth, an arm of the Moray Firth, and locks Ness, Oich, Lochy, and Eil, with Loch Linnhe on the western coast, by means of cuttings from one to another. The former is 51 miles in length, 125 feet wide at the surface, 31 feet across the bottom, and 20 feet deep. It is below the level of the sea, but it is protected by embankments from any influx of the ocean. The looks are 297 feet long and 51 feet broad, for large vessels; but there are some of less size to admit of the passage of smaller vessels. Ships of 1,400 tons burden can pass through the larger locks. The entire length of the Caledonian canal from Beauly Firth to Loch Linnhe is 60 miles, of which 23 are artificial cuttings, and th remainder the intervening looks above named. The cuttings are 115 feet across the surface of the water, 50 across the bottom, and 20 feet deep; there are 26 locks in the course of the causi, about 175 feet long and 40 wide. The difference in level between each reach is about 8 feet. The entrance to a ship canal should be sheltered, and in such a position that it may be free from the deposit of mud and alluvial matter. The nature and construction of locks and lock-chambers for these and other conals will be found elsewhere. (See Lock.) Towing-paths are made on both sides, and are about three feet above the level of the water.

## Canal

The top of the chelring bank on sister side is sut in this form of a step, to leave a few feet of shellow water between the man hody of water in the centre and the towing-paths on the sides, to break the action of water against the banks. The slope of the sides differs in different causals, but can easily as calculated from the dimensions of the depth and breadth at different points, as may be seen by reference to the annexed figure, which shows a section of the Caledonian canal Lateral canals are used as a means of affording a



SECTION OF THE CALEDONIAN CANIL

remedy for defective navigation in a river, they are similar in general principles to the ship causal and ordinary causal for barges but as the natural course of the river itself is made available for the passage (i) vessels in some parts, works of a peculiar construction are required to allow barges to pass from the river to the canal, and over error, or firm one side of a river to the other, which is often uccessary to avoid interference with another stream joining the main river below the point of transit. Sometimes it is contrived to carry a canal over any large tributary by m ans of squeduct the dimensions of the lateril canal of the Lorre, one of the best of its class are as fol-lows:—Breadth ack as the surface of the water, 33 feet, depth 5 feet 3 inches length of locks 100 feet breadth, 17 feet I he breadth of or linary bar, e canals in England varies from 16 to 50 feet across the water line, and the depth ranges from 1 to 6 feet 11 e floor line, or bottom, is rather more than twice the breadth of the largest boat likely to be used on the caual. The angle of inclination of the sides to the lotten varies angle of inclination of the state states and the state of slope, to receive shallow water but the segentrally neglected. The edge of the bank is sometimes neglected the edge of the bank is sometimes strengthened by a low parapet to prevent injury from the perpetual chafing of the tow ropes and ly paying or camp sheeting, to protect it from the wash it the waves caused by the passage of vessels. The towing paths vary from 4 to 16 feet in width accordingly as the towing is effected by means of men or horses. When it is necessary to cut a tunnel for the passage of a canal, a narrow space is sometimes allowed for a a county is nervow space is sometimes amoved for a towing path on one or both sides but when there are no towing paths, the bargemen force their boats through by lying on their backs on the top of the cargo and pushing against the top of the tunnel with their feet. Sometimes the barges are bauled through there lees Sometimes the Darges are handed through by pulling hand over hand along ropes fixed at either end of the tunnel, and in other cases, by machinery especially adapted for the purpose. Those are the old-fishnoned methods but, at the present time, a steamer is used upon the Regent's Canal and several extension. steamer is used upon the Kegen's Canal and several other canals. The bottom and sides of canals are made impermeable to water by coating them with a thick surface of puddle,—a mixture of loam or clay, gravel, and water, which is worked with a space until it will ne'ther absorb water nor adm t spaces until it was necessary as concrete as used instead of puddie, particularly by the French in addition to thus, and the construction of locks and works for communication with rivers, as in lateral canals, the saginess must be careful to secure an ample supply of water from natural and artificial sources, supply of water from natural and artificial sources, such as reservoirs, particularly in the construction of samphit-level canals, and to construct basins, wharfs, addings, and intermediate stations, to facultable the passage of vessels and the loading and unloading of Sheir cargoes. He has also to build aqueducts to darry the canal across valleys, and approx-aqueducts and sulvests (see Struck-Aqueduct, Oulvern) for

# Canal

the passage of streams and water under the best of the unit; and to nelte fixed bridges, asing bridges, and if the unit; and if the product of the unit of the state of the st

X cor.

i		T come.
New River Canal commenced	٠	1606
, brought to London		1414
I hames made navigable to Oxford		1624
Lennet navigable to Reading		7715
Lagan Navigation commenced	••	1755
( sermarthenshire Canal		1758
Dr stwich to the Severn		1756
		1/100
Duke of Brildewater's Navigation (first gree		
canal) commence t		1769
A orthamptonshii e Navigation	_	1761
Dublin to the Shannon (the Grand) 176	٥.	-1786
Staff rd and Worcester commenced		1798
Grand Irunk commer ad by Brandley		1766
F rth to Clyde commenced		1768
i ca made navigable from Hertford to Ware		1739
. to Lendon		1770
I eeds to Laverpool		1770
Monkland, Scotland, commenced		1770
Lilesmers and Chester		1772
Basingstoke Canal begun		1772
Interpool to Wigan		1774
Stroud to the Severn		1775
Staffordshire Canal begun		1776
Stourbridge Canal completed		1776
Runcorn to Manchester		1776
I rent and Mersey opened		1777
( hesterfield to the Trent	•	1777
Defended to the trent		
Belfast to Lough Neach Severa to the Thames completed		1783
		1789
Forth and Clyde com; leted		1790
Bradford completed		1790
Grand Junction Canal		1790
Birmingham and Coventry		1790
Monastereven to Athy	Ī	1791
Worcester and Birmingham	•	1791
Manchester, Bolton and Bury		1791
Manual and Remember	•	1798
Warwick and Birmingham		
Bainsley cut		1704
Rochdale, Act passed		1794
Hud lersfield, Act passed		1784
Derity completed		1794
Hereford and Gloucester		1796
Paddington Canal begun		1798
kennet and Avon opened		1799
Peak Lorest Canal completed		1800
Thanes to Fenny Stratiord		1800
Buckingham Canal		1801
		1601
Grand Surrey, Act passed		
Brecknock Canal	•	1803
Oaledonian Canal begun		1809 ~
Ellesmere Aqueduct	٠	1805
Ashby de la-Zouch opened		1895
Aberdeen completed	٠	1807
Glasgow and Ardrossan opened		1811
Leads and Liverpool opened		1918
Wye and Avon	٠	1818
Edinburgh and Glasgow Union		1818
Sheffield completed		1819
		1826
Regent s Canal	-	

# Canal

ast compatted:

of Licerpool begun

Borkshy Sinp cenal completed 1837

Lowestoft Marigation completed 1831

tota, and Retery, vol. i.

cowish and Lowestoff Earligation compress. 2012.—Ref. Reg. Oysic., and Noders, vol. i.

Camer, or Camerus (fast. comm., a reed), is applied a many parts of the human body. Canadis arteriouse is the focus, which unites the pulmosary artery and the aerts, but which disappears after iris. Canadis concerns, a canal which in the focus savers the shoot from the vera ports of the liver to be examining wone care. Canalis nusulis, a canal canadistic the internal canthus of the eye downwards.

Carrier, ka-new, a term recently adopted by us from the French, in which language it signifies a duck. This is it is used in a secondary sense, to denote a piece of information given out with the view of miscading, or in order to bring about some desirable result

CAPARIES, &dn-si-rees, in Mus., a lively dance-tune, in three-eight time, said to have been introduced into this country from the Canary Islands. It is, however, mose probable that it was carried over from Normandy to these islands by John de Bethencourt, who invaded them about the close of the 14th century. The Canaries is introduced by Purcell in his " Diocletian:" the tune is in two strains of eight bars each, in three-eight time.

CAPARTUM, kh.nai ri.um, in Bot., a gen. of plants belonging to the nat. ord. Ampridacem. The species are natives of the Spice Islands and parts of Asia. C. commune is cultivated for sake of the kernels of its fruit, and for the fragrant resinous substance which exudes from its bark. The latter probably constitutes the Manilla Elemi of commerce. C. microcarpum yields an oil very like copaiva, known in shipbuilding vards as Damar. Other species produce edible fruits, useful oils, and resins.

CANARY BIRD, ki-nail-re (Carduelis canaria).—This popular and pretty singing-bird is a native of the Canary Islands. Its introduction into Europe was comewhat singular. According to some authorities, at the end of the 14th century, and to others, at the end of the 16th century, a vessel containing, among other merchandise, a number of canary-birda, and which was bound for Leghorn, was wrecked on the



LONDON CANARY.

coast of Italy. The birds, being set at liberty, took refuge in the adjacent island of Elbs, and the climate being congenial to their habits, they increased con-siderably. The islanders, finding such an elegant suggests anddenly settling in their country, were anxious to become possessors of them, and quickly the whole colony of canaries were taken prisoners. From

# Cancelling of a Deed

greet; whereas, in the domesticated essary, we have a great variety of colours,—green, yellow, white, brown, grey, &c. This is, of course, owing to the sumerous cross-breedings this species has been subjected to. It broods freely with several other species; the goldfinch, the builfinch, the sistin, the green-bird, and the linuse, among the number. Altogether, it is reckened that there are no less than thirty varieties of the canary. The best authority on the subject say,—"Theoconaries that have the upper part of the body of a dusly green or linus-brown, and the under-nart the canaries that have the upper part of the body of a dusky green or linnet-brown, and the under-part the yellowish green of the green-bird, with dark-brown cyes, are the strongest, and most nearly resemble the primitive race. The yellow and the white have often red eyes, and are the most tender. The chestaut are the most uncommon, and hold a middle rank for strength and length of life between the two extremes. strength and length of life between the two extremes. The canary that is most admired smongst us now is one with the body white or yellow; the head (particularly if created), wings, and tail, yellowish dun. The second in degree is of a golden yellow, with the head, wings, and tail black, or, at least, dustry grey. Next follow the grey or blackieh, with a yellow head and collar, and the yellow, with a blackish or green tuft, both of which are very much valued. As for those that are irrespulsive spetted anachied or variegated tuft, both of which are very much valued. As for those that are irregularly spotted, speckled, or variegated, they are much less sought after, and are used to pair with those of one colour,—white, yellow, grey, browngrey, and the like."—(Bechstein's Cage-Birds.). In Germany and the Tyrol the breeding of this bird is carried on on an extensive scale, and it is principally from these places that the rest of Europe is supplied. In its mixture hours, the conversion of the property of the property is not because of the property of the proper In its native home, the canary builds its nest in thick, bushy, high shrubs and trees, with roots, moss, feathers, hair, &c.; pairs in February, lays from four to six pale-blue eggs, and hatches five and often six times in paie-inte eggs, and maches are and order at takes as the scason. Bechatein gives the following directions for getting and keeping good canaries:—"The most essential is to choose from among the young that which promises a fine tone, and to seclude it from all other birds, that it may learn and remember nothing bad. The same precaution is necessary during the first and second moulting; for, being likely to relearn, if I may say so, its song, it would introduce into it, with may say so, its song, it would introduce more of more equal ease, foreign parts. It must be observed whether the bird likes to sing alone or in company with others; for there are some which appear to have such whims, iking to hear only themselves, and which pout for whole years if they are not humoured on this point. Others sing faintly, and display their powers only when they can try their strength against a rival. It is very important to distabute regularly to singing-birds the simple allowance of fresh food which is intended for the distance of the desired. the day. By this means they will sing every day equally; because they will cat uniformly, and not pick the best one day, and be obliged to put up with the refuse the next. About two spoonfuls of dry food is sufficient for the daily nourishment of a causary."

CANARY-GRASS. (See PHALARIS.)
CANARY WINE.—This wine, which is also known by the name of Teneriffe, is a product of the Canary Islands. In taste it resembles Madeira; it is made from grapes which have been gathered before they are ripe, and, when new, has a sour and unpleasant teste. After being kept carefully for two or three years, its mildness increases greatly, and, like Madeirs, it is greatly improved by a journey to the tropics. More greatly improved by a journey to the tropics. More of it is produced on the island of Tenerific than on the other Canary islands. The name of Canary is only applied to the Bidogne wine, and never to the Malvoise or Malnesy of the Canaries.

CANCELLABIL, kin-sol-lai-red, the name given to an inferior class of servants of the church in the earlier part of its history, but the precise nature of whose duties is doubtful.

CANCELLI, kausel' li (Lat., lattice-work), in Med., is applied to the spongy or reticular substance of the

bones. (See BONE.)

CANCELLING OF A DEED, kin'-sel-king, is a delivery
of it up to have lines drawn ever it in the form of wance colony or canaries were taken prisoners. From of it up to have lines drawn over it in the form of finite they were brought to other countries, and became lattice work or cancelli, though the phrase is used highly raised as singing-birds. The wild bird of the figuratively for any manner of obliterating or detacing Canar stands and the demesticated bird so familiar in this nontry are quite at variance in personal approximate. The polour of the wild canary is a dusky rally speaking, the effect of a dead can only be designed.

the sodin de. rives its pame although it is many centuries since the constellation and sign occupied position. The sodiacal division so called occupics the thirty degrees of the ecliptic between 60° and 120° from

the first point of lines, or the vernal equinox. The most conspictions star in the constellation is Acubens, a star of the third magnitude.

CANCER (so called from the large blue veins which appear, in esacer, to resemble orabs claws), is a disease of a very malignant character, making its upearance as a seirchous tunour, which ultimately terminates in au ill-conditioned and deep ulcer. Any part of the body may be the seat of this disease, though the giands are most liable to its attack. The female breast, the tongue, or lips, are among the parts most subject to it. The tumour at first is small, hard, indolent, and nearly insensible, with little or no disco-location of the surrounding skin. It remains in this state for a longer or shorter period, sometimes for rears, but at length it passes into a more active con-dition:—the tumour increases in size, the skin changes the timour increases in size, the same changes to be felt in it. The pain, which is of a shooting or lamonating nature, is at first slight, and occurs at considerable intervals; but it increases by degrees, and the intervals diminish until it becomes almost constant. The currently in the constant of t tancous veins become turgid, and the surface of the turnour presents to the feel a knotty, uneven surface. Sometimes the skin never actually breaks, but usually, after a longer or shorter period, the tumour ulcerates and becomes an open sore. The discharge is of a thin, fixed, herid nature, which corrodes the surrounding parts. The sore presents thick jagged edges and a soft centre, easier as it were into irregular cells. The shooting pains are now much increased, and are of a very riolent nature. The disease pursues its onward course; sometimes it seems as if it had exhausted itself, and was allowing nature to work a cure by the formation of reas flash, but this is morally a delivation. formation of new flesh; but this is merely a delusion, for it soon recommences its destructive course, and at length, it may be after years, it series upon some vital organ, or the patient sinks exhausted by the pain and continued drain upon his system. Of the cause, nutrition of the continued drain upon his system. Of the cause, nutrition of the continued drain upon his terrible disease little is, unfortunately, known. By some it is regarded as continued by other as lead to the continue of the continue amfortunately, known. By some it is regarded as constitutional, by others as local; some maintain that it is hereditary, others that it may be transmitted by inscellation. So far as may be judged from the conflicting evidence on these points, there does seem, in general, to be a certain constitutional predisposition to this disease; though, according to Mr. Paget, only a sixth of the cases can be traced to any hereditary transmission. The evidence is against its being transmitted by incoulation. If cancer be at any period merely a local disease, it can only be in its earliest stage, for, In a short time, the whole system seems to be infected with it; and hence it is that, after a time, the extirpation of the original tumour so often fails in effecting a complete cure. Though all ages and both sexes are a complete cure. Though all ages and both sexes are lipble to this disease, the young are less frequently attacked by it than the old, and females are more substacked by it than her out, and remains are more sup-ject to it than majes. Though canger is, sufortunately, by no means uncommon, it is not all, nor even the majority of tumours, that bear a general resemblance to it, that are emicarous; in fact, it is often with the

ciating agony The only ho pating the tumour in its east after all, frequently affords. According to Mr. Paget (L. logy), the average duration of life of the cancer is forty-nine month in which the cancer was once re the average duration of life was so forty-nine months; and hence he average duration of life is not man the removal of the local disease, but probable that the progress of the mo-retarded by the operation. Sometim the knife, escharotics, as chloride of course to, but with no better success may not be expected, much good may means of palliatives; the patient is to 1 good nourishing diet, but all stimule avoided, and everything that would i the activity of the disease. The state health is to be carefully attended to, and body kept as free from excitement the local treatment of the disease, seda lock, henbane, and optum, are to be had seen order to allay the pain. Among the lower of disease is not of unfrequent occurrence, most liable to its attack being the dog and a

CANCER, a gen. of short-tailed Crustacea. is now generally restricted to the common de CRAB.)

CANCEL-BOOT. (See EFFFREGUS.)
CANCEL-BOOT. (See EFFFREGUS.)
CANDELABRUM, kin'-do-dai'-brum (Lat., cos candle), an article of furniture much meed ancients both in public and private building though properly signifying simply a osset the term was generally

the term was generally applied to the support of a lamp. The candelabra u lamp. used in public edifices were mostly of large size, with a cup or receptacle ut the top, to contain a lamp or some substance capable of illuminating. discovered at Herculalong thin bronze stands, with flat disks or vases at the top, on which the light was placed. The triangular, with the head of a lion, griffin, or goat at each angle. In all buildings the candelabra were amongst the most richly-ornamented cles, and were made of bronze, iron, marble, terracotta, and wood.



CANDELABRUM

Some, however, were made or covered with gold and silver. Sometimes, instead of a shall, a figure was introduced, holding, in one hand, the one or receptacle for the oil. A small candelabrum was used as an altar. There are several specimens of the smilent candelabra in the Townley collection in the British Museum.

CANDIDATE, kan'-di-doit (Lat. similars is a term used to denote an applicant for a didus, white), privilege, or position. It is derived from the itemans, among whom those who sought offices or preferments were white robes, and were called condition. In this wrom when the who are the conditions of presentations were white robes, and were salled operations. In this dress the conditate endeavoured to gain popular through the every possible way. By canvassing the people addressing them in the market-place, and it may be

Candleman

The appearance is dle, and to proceed mereon who is about to die, and to the shardward precisely in the same his shardward precisely in the same his shares is afterwards to be carried. If the same is a pale-blinish colour, the same age. If several of different sizes are will see many corper of like agos pass to the same of the sam

mrant a was formerly a mode of marking side of time, generally for deliberation or see time. Thus, excommunication by inch ing a ming when the offinder was allowed time to no long as a candle continued burning, after actions of axoommunication was pronounced him. Mose or auction by anch of candle was a wild at which persons were allowed to bid while in the of candle continued burning, and the property was adjudged to the

man. (See Crescratiaciaces) Light-dis (Lat, 5p, Ital condeis) — A be defined as a contrivance for purposes of stion, consisting of a wick of fibrous material and by would fatty matter, being distinguished a latter particular from lamps, in which the fatty it liquid. It is difficult to determine the exact a which candles were first used. There are several of candles being mentioned in the Old and "Telepaneute; but the context proves in most cases the Mabrew word should be translate liamp, and not adds. For example, the seven branched candlestick nadared to have seven lamps made for it, and Asron directed to use obve-ou as the fuel thereof. Torches as arresses to use ourself as the interferent forcing are manifested in various ancient writings, and from them, in fault, candles were gradually developed Plans, however, describes a candle made of brittle trained, which clearly corresponds to our modern rushing the later days of the Romans, wax candles remaich used by the upper classes. In the Middle spring the same material were made, weighing which as 50 lbs., and the Britons and Angle Saxons
of crassmented tapers in their processions. The
master of candles by King Alired for horological
repass it to well known to need further allusion
and bld differs Winte of Schorne describes rushlights. tieing made and used by the cottagers in his time cing these and used by the Changers in his time manufacture of candles progressed but little in changing until the year 17 19, when W Bolts took in matter for various my rowements in candle-ting, equalities chiefly of a method of pressing the it days. Most of the improvements up to the a time have been in the same direction,—the same direction of the same direction of the same direction of the same direction of the same dispersion of the same same same direction. disigreesbie since of mproperly purified, for, ortion of cellular matter, it the minutes, portion of cellular matter, it cless. Tallow is generally purified, or it is termed, by being melted in a copper d to the direct action of the ine. The im-a to the top, and are skimmed ind pressed a the torms the "gieures" of the shops, the feeding dogs. On the continent the ited by steam heat with very dilute tribled by steam near with too, and the cel-Take purpose of destroying the cel-factow prepared in this way is much that purpled by the ordinary method lines been made, from time to time, to as of spoilers by causing the wick to curl in the lines, so as to become district, so as to become consumed by the sirk. That as yet, has not succeeded 420

these researches, it was furth stearin and margarin contained fe with the base of giveens. These provement was, therefore, to devise a them from the base with which that This was effected in American and the control of the This was effected in two ways, by in the invention of De Vielley and by a the invention of the victicy and are cation, a process we owe to the ingents man, one George Gaynne These proc as follows -Lime saponification -Tallor lime, are boiled together until complete s lime, are boiled together until complete takes place, or, in other words, until the lime composed, the fat unting with the stearie, as and olen soids to form an insoluble comp, satisfaand ofer, solds to form an insoluble scap, seven, the giverine, which dissolves in the water. When the lune soap is reduced to powder, and the When it has reached the holling-point, subplustic a added, which combines with the luns, setting the three acids already mentioned. The dislocation of the control the three acids aircady mentioned Time disks as being the hightest, separates, forming an oily layer; the top, and the beavier fatty acids are drawn off in cooled, and further purified by pressure. Subject saponification—In this process, the tailow of last boile i with sulphuric acid, which acts by making with the base of giveenne to form sulpho-giveens with the base of giveenne to form sulpho-giveens with the fast of the community of the fast with the fast of the community at the fast of the community and the fast of the community and the fast of the community and the community of the community and the community of the communi a its to form sulpho stearic, sulpho-margaris, sulpholenc acids which are easily decomposed twice. When the decomposition is complete, which are decomposition is complete, when the decomposition is complete, when the decomposition is complete, when the decomposition is considered. and a passing over in a tolerably pure condition. The action passing over in a tolerably pure condition. The pressure, which chaminates ilquid oler and The best steams candles are a minimum to the condition of the pressure candles are a minimum to the condition of the pressure candles are a minimum to the condition of the condi ture of stearic and margaric acids Composite sta contain these two acids, mixed with stearin, is was proportions The principal source of shearin has steam and is paim oil the manufacture being energy on chiefly by Price's Patint Caudia Company We caudic are dipped and rihed between two marth caudic are dipped and relied between two is slabs until the proper shape is obtained. Speed is the sold partion of the oil of the sperm-whale is obtained by filtration and pressure. The mointenant improvement lately introduced into the making is the manufacture of candles from goin a solid substance obtained by the datalistics of at a low temperature, and containing the sleiner on the substance obtained by the datalistics of a celebrated Paris manufactory for stearing on indicating the utensis employed. Plate 3.22. sectional view of this manufactory vertically and both plates represent in or sectionally and both plates represent in the means of communicating the more the means of communicating the means of operation of the fermation of soap is a large vat, generally constructed of w conteal in form, and provided with several way up The bottom and the lid are of we the capacity is sufficiently great to contain m 70 56 culne feet Generally about 1,100 Ms. a are placed therein, with about 200 gallons and easily dissolve the same This is hereoff from a leaden pipe (q) winding in a serpest ner, and placed at the bottom of the from pipe is perforated with a number of across which the steam parses as it proced to the first of the first which it was the way that this is melted, 150 lb of wall-in on non-time is merred, 160 to or west-marked sinks and added, the preparation being allowed thing to minuse. Great care is at the same time taken to will skir it by means of an agitator (p) composed of image hearches, united by a cross-piece, and hearing a kind of knile fixed at each of the four arms. This contributes in mounted upon a vertical beam (v), to which a relaxy

Candles

movement is given h composition troughs, into d the solid matter after it has been broken. matters are decomposed under the in-righty-diluted sulphure seid. They are stains by a serpentine pipe (q') The properties and the series is performed in this way ross or suseming ane arids is performed in this way by fastine of a tap (q') they are withdrawn, as much as possible of sulphirhs soid and lime are drawn of inter a sayine of size moulds (M), which are arranged in rays along the entire length of the workshop These moulds present the form of a rectangular prism, from 27 to obtaines in length from 63 to 7 to obtained in length from 63 to 7. inches in breadth, and about 164 feet only in height.
Thus are formed layers of solidified and which are isken away to the vertical hydraulic press N, of which it is easy to see the construction ly reference to the design, Plate XXX, where it is shown in vertical section The ver and had sait property and in retinate detected to obtain a pressure of 140,000 as nare pounds. A great part fits the action of this pressure of the action of the part of th in the and of a certain temperature. Other presses there made construction leaded by steam are also err, eyed. Such as the press represented in P.P. upon the place, Plate X.I.A., and upon the vertical section, Prate A.XX. In the hot pressure press the wrought aron plates (P), are heated and between these plates are place the links which proceed from the vertical es, an twhich in issuing from this press are envoluped n horechair material, in place of woollen sorge on bright air material, in place of wholen sorge. On the presents sale to the pres to fit be pressed as the confidence of the pressure of the pressure of the press to beautiful the double of the press of beautiful to confidence of the press of the press of the press of the pressure as the pressure of the pressu ance as the present it we conditive the and where the plates may be non-red when they have become replied These plates are; heated to boiling water rates gh In Plate AXA is show it is node by these plates can it raised to furnish heat to t press, or rem rocally the purification of the said ands is thus performed—the lumps of steame A margaric acti hare taken from the horizontal pressure carried to the trough R to be there purfied by the angle of the trough R to be there purfied by the angle of the trough is heated by the angle of the the acts. The object of this cleaning is to disengage the lat acids fig. 2 the termines trace of lime they may contain the termines to the termines to the termines. After this operation it only remains to free them also from the seid itself, by purifying with water. They then allow thus to remain or dicant it into another tringh (ft) situated upon a lower floor, and which only contains pure water. When it has cooled, it is drawn off into moulds, and at length is obtained in rolls perfectly fit for working into candles. For the rurpose of meting and in miding the white solid acids a copper is used (se T, U, Plate A k A, b which is in the interior silver lated, to prevent the disciplination of the scales. The copper is double. is in the interior silver plated, to prevent the discoloration of the seeds. The copper is double
bettomed, to be heated by steam at a temperature
which should not ordinally exceed 100° C. The steam
presence from the generators into the double bottom
by the sign w, and this, condensed, flows off 13 appe,
if he double to the pipe which issues from
the bottom of the copper, serves to empty it comp.
It is surrounded by a cast of wooden staves
whetely. It is surrounded by a cast of wooden staves
whetely. It is surrounded by a cast of wooden staves
whetely. It is surrounded by a cast of wooden staves
whetely. It is conjugated to the pupe
and of this copper is placed a table (V), upon which
rests the reduct of the cooling of the trough. By the
to church on that day with candles in is
acted to be conversed into the monitor. These candles is a
constitute the conversed into the monitor of the cooling of the trough
are gooded in monitor and the monitor of constances.

The weather on Candleman day

m the workshop, and up allowed to cool after they wicks are fixed in the centre of carried to the hot-water basins, witto the temperature of boiling water basins (V) represented in Plates XXIX and XXX When \$\( \) cently hat, they are filled by the mid (11), which is plunged into the cooling of the mondes, they remove to peg which holds the wick, and by mean extract the candle After being modified are bleached by being exposed during the action of light, air, and a hamil The last two processes the candles are suithose of polishing and packing. The pel by rubbing the candle briskly with a damped by alcohol or ammonia. The sists in arranging them to form pack and they are carefully and nestly seems The two boilers, or steam coppers, of the are represented at A and A', Plate X not only ited the engine, but also heat to troughs The plate represents a horsental seen from the top and shows the disposition butter with their safety-values, and also the conduct ny the steam. In B will be per brick furnace in which the boilers are b the saiety valves and in b' the floats, pipe communications with the feed-pure pipes for conducting the steam to the dif ratus of the machine, and d d the pipe nish the steam engine. All these pipes at and provided with taps. The cleic atid, long time was regarded as a superfinous p of late venrs been successfully applied to the of wo I employed in silk van manufactures, or of wo I employed in silk van manufactures, a scouring it The oleic acid, as left from the summanufactory however, cannot be employed for purpose of greasing wool until it has undarged complete purification, or been brought into a second geneous substance possessing all the shows ment characteristics. The cleic and made use of is

from different materials, see Couda mux Pine, Spheraceffi, Wax, and Ozorneita.

Campiemas, kun di mus, a religious fessival obse in h nour of the purification of the Vergis Mar.

Library, the 40th day after the New the 2nd of February, the 40th day after the New The name Candlemas is evidently derived from consecration of the candles to be used in the share during the veer, that takes place on this di the Roman Catholics There is also a process lighted candles on that day. In an old does 10 Henry VIII, entitled "Comocravaginities" momes to be used in due fourme in the Charlest lande, it is declared that the bearing of

in colour and clearness to the finest cleic wil

certain steam caudie factories they menufacture with the oler and a hard soap (For details up the various points connected with caudie manufacture from different materials, see Coods MYT OR, PARAS-

Cana

to repartied at tedicating the character of the

"The limb had as list a Lin offern a hier. As that Conflequents Should be gleened as

In Scotland it is enid.

" If Candleman is fair and clear, There is he two winters in the year."

eard the following:and the last

If Candlemae-day be fair and clear, Tag built of winter's to gang, and mair; If Candlemae-day be wet and foul, The balf of winter's gane at Yule."

Care, free (Let. conns), a term commonly applied care smell smooth stick, but more correctly limited a the stem of a small palm or large grass. (See

LAMUS, BAMBUSA.)

CARLETS, RAINEVEA.)

CARRIAGA, Fil-nel'-ld, in Bot., the typical gen. of
the mail. ord. Concillaces. The inner bark of C. alla
forms the Canella of the spothecaries. The tree is
common in many parts of South America and in
the West-India islands, where it is often called Wild
Climamon. The bark is removed with an iron instrument, and, after being deprived of the epidermis, it is dried in the shade. It is seen in flat or quilled pieces, or a light influence, and from having been confounded with Winter's bark (see DRIAYS), it is sometimes called sparious Winter's bark. Being an excellent aromatic, stimulant, and tonic, it is frequently used in medicine. In the West Indies and some parts of Europe it is used as a spice. Distilled with water, it yields a red dish veilow, fragrant, and very acrid essential oil, which is often mixed with, and sometimes sold for, oil of

CAMBILLAGER, ka-nel-lai'-se-e, in Bot., the Canella fam., a sat. ord. of dicatyledonous plants, in the sub--Concile and Cinnumodendron, which consist of ever-

grees shrubs possessing aromatic properties.

Came, Canque, or Kra, king, the name of an inatrament of punishment used in China. It is composed of two heavy pieces of wood worn round the neck like coller, and usually from 50 to 60 lbs. weight, but sometimes above 100.

CANGI, CRANGI, OF CANGANI, kăn'-gi, an ancient people of Britain against whom Ostorius Scapula led his army after the reduction of the Iceni, A.D. 50. Antiquariant are much divided in opinion as to the character and inculty of this people; but the generally received opinion is that their country lay about North Wales, or somewhere between the Iceni (East Anglia)

CAMPOULAR DAYS, kan-ik'-u-lar (Lat. dies caniculares, or dog-days), among the ancients, were twenty days before and after the beliacal rising of Canicula, which, occurring during the noticest part of the year, was sup-posed to be the occasion of the great heat, and of the diseases that prevail about that time.

Carrievian Freezi about that time.
Carrievian Yang, (Lat. canis, a dog), in Chron.,
the name of the year as observed by the Egyp-tisms and Ethiopians, so called because reckoned from one believed rising of Cameula, or the Dog-star (Birine), to the next. The reason of the choice of s) to the next. The reason of the choice of brightness, as that its heliscal rising then coincided

brightness, as that its heliacal rising then coincided with the greatest swelling of the Nile; and hence the first rising of this star was annually observed with great attention. The Canicular year ordinarily consisted of 355 days, and every fourth year of 366. Canical and the Canicular year of 366. Canical and for the continuous term in feed, well to distinguish the Dog tribe, which includes for, well-se, jackale, and foxes. There are many variation of dogs, most of which are clearly defined. Of all the interior maintain the dog is the greatest friend. which are clearly defined. Of all the grantest friend and companies the dog is the greatest friend and companies of man. In the south-east of Europe, and in facts of Asia, the dogs have no masters, and mois, a very pure and useful starch, now largely constroll about the forms and villages, hving upon carriers and effect. The Mahometans and Hindoos look upon the forms are will not touch them without as admitted. The Mahometans and Hindoos look upon the forms are without as admitted. Putting assiles have been demosticated and attached furnish the supply. The Thirmse called African are the supply.

Compa

In the monuments of pliewers of man is all ages. In the monaments of Syrpt and Diruch several spaces of domestic dog resrepresented; and in one of the Wipersh soulpture we represented; and in one of the Nipersh soulptur brought to this country by Lapard, is a magnifice specimen of a mostliff. There are several varieties wild dogs in India, and in Australia there is a we sware wild dog, called the Dings, which bears a sho recembiance to the wolf. Maturalists are not agre as to the parent stock of the dog; some consider th it is derived from the wolf, while others trace it to be it is certised from the wolf, when covers at to be in jackal: no trace, of the breed, he works, is to be for in a primitive state of nature. Where dogs have be met with wild, they have never shown a tandecovy to turn to the form either of the wolf or the jackal. have been found in a fossil state. The wall was formerly have been found in a form in the new entire and the still infeats the western countries of Europe. Is all its varieties the wolf is a cruel and cowardly amount. The jackals are gregarious animals, which hand in packs, and prey upon smaller mammalis and positry. Their long-protracted acreaming cry at might is peculiarly the protracted acreaming cry at might is peculiarly and protracted acreaming cry at might is peculiarly acreaming the protracted acreaming cry at might is peculiarly acreaming the protracted acreaming cry at might is peculiarly acreaming the protracted acreaming cry at might is peculiarly acreaming the protracted acreaming cry at might is peculiarly acreaming the protracted acreaming cry at might in peculiar acreaming cry at m liarly disagreeable. They are natives of India, and are found also in great numbers in Syria. The foxists are found also in great numbers in Syria. The for is a native of Europe, America, and Northern Asia. Its cuming and sagacity are proverbial. It is preserved in Great Britain, and affords great diversion to the sportsman. The tribe Canina belongs to the class Mammalia, ord. Fera, and fam. Felides. (See Doc.) CANIS MAJOR, kai-nis mai-jor (Lat. nanis, dog; major, greater), in Astron. a constellation of the southern hemisphere containing Sirius (see Strive), which is the brightest star that appears in the heavens. It is situated below Orion, and a line drawn through

It is estuated below Orion, and a line drawn through the stars composing Orion's Relt will page through Sirius if produced. Besides this brilliant star, it contains one of the second mugnitude and many of the

third and fourth.

CANIS MINOR, mi'-nor (Lat. canis, dog, minor, less), in Astron., a constellation between Gemmi and Can Major. It contains a brilliant star of the first magnitude, called Procyon. It is a constellation of the

southern hemisphere.

CANKER, kank'er (Sax. conore; Lat. concer), a disease in trees which attacks the young shoots and branches first of all, and at last appears in the trunk. If not cured or its progress prevented by cutting back the tree, that it may throw out new branches, it will gradually destroy it in the course of a few years. It is produced by accidental intery to the branches, or by superabundant moisture about the roots, that astiff subsoil will not allow to drain away. The usine is also subsoil will not allow to drain away. The name is also given to a disease which appears in the feet of horses and in the ears of dogs. In the horse it is produced very often by damp and dirt, but in some cases it is constitutional. Unceration takes place between the outer casing of horn and the tender part of the foot which the horn protects. It is attended with considerable inflammation, the horn becomes detached in parts, and proud flesh is formed. The portions of horn that are separating from the foot should be removed, and the sore dressed at first with a caustio preparation to stop the growth of proud flesh, and atterwards with Friar's bulsam. Until a cure is effected, the foot should be protected with tow, which should be changed: daily. Care should be taken to keep the foot clean and dry. In dogs, inflammation of the car produces ulceration and the formation of proud flesh in the interior of that organ. Bathing with warm water will often check the disease; and if this will not do, Goulard's lotion should be applied, to which a little shum may be subsequently added to heal the ulors. In some cases the disease appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the flat at the same appears at the edge of the edge of the edge of the edge of the disease appears at the edge of the flap of the ear, when means must be taken to prevent the deg from irritating the sore by scratching, and it must be dressed with an ontiment in which a fair proportion of alarm has been mixed.

CANNA, kim'-uli, in Bot., a gen. of plants belonging to the lat. ord. Marantagra, or Arrow-coot family. One or

## Cannabinacem

meria, from its resonablance in appearance and propor-ties to ordinary commercial turnieria, is said to be the produce of C. escalara. The sends of C. indica are commonly called Indian shot, on account of their black colour and peculiar hardness.

colour and peculiar hardness.

OARNABIFACE's, kin-nd-bi-suc-se-s, in Bot., the Houp farm., a nat. ord. of plants of the selast Dicotyle-dosse, sub-class Mosachianydes; consisting of rough herbs with a watery fulce, having the following structural characters:—Leaves alterrate, lobed, stipulate; flowers small, unisexual, directous, the males in racemes or panicles; calyx scaly, imbricated; stamens 5, opposite the sepals, with thread-like filaments, the females in spikes or strobiles, each flower with one sepal surrounding the overve, which is superior and I-celled, conspiles or strobles, each nover was one separate ing the oversy, which is superior and I colled, containing a solitary pendulous ovale; fruit indehiscent; seed without albumen. There are only two genera, Canaghis and Humulus, the Hemp and the Hop, and each consists of but one species. They are natives of

oson consists of Duc one species. They are natives of the temperate parts of Europe and Asia. CARRADIS, kin'-ni-bis (Lat.), in Bot., the Hemp, a gen. of plants representing the nat. ord. Connabinacen.— Connabis sativa, the only species, yields the valuable fibre called hemp, which has been known for more than 2.500 rears as a material becomes than 2,500 years as a material for cordage, sacking, and cloth. In Britain the plant grows to the height of about six feet, but in warmer climates it has occasionally been found eighteen feet high. The principal supplies of the fibre are derived from accounting fruits, commonly termed hemp-seed, are oleaginous fruits, when and demulcent, and are used for feeding birds. submitted to pressure, they yield about 25 per cent. of a fixed oil, which is used for making varnishes. In the sap of the hemp-plant there exists a resinous substance which has extraordinary narcotic properties. In northern climates the proportion of this resin in the several parts of the plant is so small as to have escaped general observation; but in the warmer regions of the East, the resinous substance is sufficiently abundant to exude naturally from the flowers, leaves, and young twigs. The Indian hemp, which is so highly prized for its narcotic virtues, is considered by some botanists to be a distinct variety, and is distinguished by them as C. sation, var. indica. This berb, and the resin obtained, are largely employed in Asia, and in some parts of Africa and South America, for the purposes of indul-gence. The whole plant dried is known by the name of ganjah in the markets of Calcutta. The larger leaves and seed-capsules separated from the stalks are called bung, subjec, or sidhee. The tops and tender parts of the plants, collected just after the flowering time, are in some places soid under the name of huschisch. The dried thovers, galled kief in Morocco, contain so much of the narcotic principle that a small pipe filled with them, it smoked, will suffice to intoxicate. The dried night of the drawn and the contract of the dried night of the drawn and the contract of the dried night of the drawn and the contract of the dried night of the drawn and the contract of the dried night of the drawn and the contract of the dried night of the drawn and the contract of the drawn and the contract of the contract of the drawn and the contract of the drawn and the contract of pistils of the flower enter into the composition of the Turkish madjoun. The resin which naturally exudes from the leaves and flowers, when carefully collected from the leaves and howers, when carriany conserved by hand, is known as momeou, the same, when beaten off with sticks, is sold under the name of cherrus. An extract obtained by the use of butter, when mixed with spices, forms the dawanese of the Arabs, and is the foundation of the handlisch of many Eastern com-rises and districts. The dried plant is smoked and tries and districts. The dried plant is smoked, and sometimes chewed. Five or ten grains reduced to powder are smoked from a common pine along with ordinary tobacco, or from a water-pipe with a peculiar variety of tobacco called tombeki. The resin and resinous extract are generally swallowed in the form of pills or boluses. The hemp-plant and its preparations appear to have been used from very remote times. effects of the natural resin or churres have been carefully studied in India by Dr. O'Shaughnessy. He

# Cannibals

that the use and meaning of our word "most probably arisen, the word having from headlenkers, a hardware." from Assetsechia, a haschisch-eater. Indian heupp was tried by Dr. O'Shaugi matian, hydrophobia, chelera, and to lust such wonderful cures were affected. was pronounced as anticonculsive ramedy greatest value. Pereira calls it an exhiberant, is phantamatic, hypnotic or soporific, and same or narootic. The extract made in India, a imported, has been found to be much strong imported, has been tound to be much assumed that made over here. This fact seems to protein the plant is materially injured by the versue. Johnston's Chemistry of Common Life.

CANNEL COAL, kind and kolo, a briffle so variety of coal, having a waxy lustre and a confidence of the protein the pr

variety of coal, having a wary lustre and a concluded fracture. It burns with a bright fame, emitting large quantities of gas, which renders it particularly valuable food, a name given to it from the candle like brilliance of its fame. The Scotch miners call it served each from the chattering noise it makes when thrown into the fire. Some of the harder varieties are used for working into correspond to the control of the served was the control of the harder varieties are used for which in the correspond to the control of the harder varieties.

working into ornaments like jet.

CANTRALS, kint mbils, is supposed to be scorring-tion of Caribs, the original inhabitants of the West-India islands, who were reputed to be mon-eaters; and hence the term has come to depote anthropological or persons who devour human flesh. Sometimes pe sons have been driven by dire necessity, as in s and shipwrecks, to eat human flesh; and there have even been instances known of persons in civilized countries with tastes so deprayed as to manifest a eraying tries with tastes so deprayed as to manager a confer for that kind of food, and to commit marder in order to obtain it. Many persons, however, have doubted whether there ever existed, in any state of acciety, a conference of the species with the species of the people who were voluntarily addicted to this species of barbarity; but the testimony of modern travellers, as well as of ancient writers, is so strong upon this point as to leave little room to doubt that it has been, and even still is, practised among various races. Homer represents the Cyclops and the Laestrygons as unthrepophagi; and, according to Herodotus, the Massagets ate the flesh of their aged parents. Herodotus also asserts that the Paden of India were in the habit of killing and eating their relatives when they fell ill; and that, snong the Essedones, when they had that, snong the Essedones, when a man's father died, his relations came and helped to eat the dead man, whose flesh was rendered more palatable by being mixed up with that of animals. Such accounts as these have been fully borne out by the descriptions of modern traveliers. The statements of Marco Polo of modern travellers. The statements of Marco Fold regarding the Battas, a people of Sumatra, have been confirmed by Mr. Marsden. When America was dis-covered, this practice was found to prevail to a very great extent. According to Prescott, they (the Mexicans) did not eat human flesh morely to gratify a brutish appetite, but in obedience to their religion "they (the Their repasts were made of the victims whose blood had been poured out on the altar of sacrifice." The body of the sacrificed captive "was delivered to the warrior who had taken him in battle, and by him, after being dressed, was served up in an entertainment to his friends. This was not the coarse repost of famished ans trends. It is was not the coarse repast of annahuse cannibals, but a banquet teening with delicious severages and delicate vinuds, prepared with art and attended by both sexes, who conducted themselves with all the decorum of civilized life."—(Conquest of Mexico.) In New Zealand and many parts of Africa cannibalism was systematically practised, with some, human leak helius recorded as a great delicar and some present of the control o flesh being regarded as a great delicacy, and even pre-ferred to every other kind of food. M. Du Challin states that the Fans, a people of equatorial Africa, not only devour the bodies of captires but even the bodies of those who have died of disease, parchasing for that purpose the corpses of neighbouring triber, and disposing in the same way those of their own. He relates that "u party of Fans, who came down to the sea-shore, once actually stole a freshly-buried body from the cemetery, and cooked it and as it among them; and, at another time, a party conveyed a body into the woods, cut it up, and shoked the fiesh, which they carried away with them." Some of the cannibals are now said to disalay a considerable decree of tasks. Orientals its general effect is of an agreeable and cheerful character, exciting them to laugh, dance, and sing, and to commit various extravagenees. It, however, and the commit various extravagenees. It, however, excitable and quarrelsome, disposing them to acts of violence. It is from the extravalue of the commit various of the campital posing them to acts of violence. It is from the extravalue of the campital are even said to display a considerable degree of the

with the individual to whom it is administered.

states that when taken in moderation it produces in-crease of appetite and great mental cheerfulness; while in excess it causes a peculiar kind of delirium and catalepsy. The effect produced by hemp in its different forms varies, like that of opium, both in kind and in degree, with the race of men who use it, and in the matter of human flash. The Caribees are reported to have preferred sucking infants to all other food. Among the North-American Indians, the greatest luxury which a successful warrior could onjoy was the heart of his vanquished enemy. Among the Fans the heart of his vanquished enemy. Among the Fans the head is a royalty saved for the king; and this, too, is the part which fisheard Courade-Lion is said, in the old romance which bears his hame, to have partaken of, and to have declared that, "there is no flesh so convisions unto an Englishman as the head of a nouriesant unto an Englishman as the head of a Saresyne." The Feejee islanders are reported to have, in some cases, "spared the crews of English have, in some cases, "spared the crews of English and Brench ships wrecked on their coasts, as they had found, by experience, that the flesh of such persons

was tanted to an unpaissone extent by the savour of salt and tobscoo."—Energe. Brit.

CARHON, kdn'-non (Lat. canna, a reed or tube; ital. cannone, a large tube).—As an account of the prigin and progress of artillery and engines of war, from early ages to the present time, and a description the different the different that different the different the different than different the different than of the various improved weapons, and the different kinds of ordnance used in the English service, and come of the foreign armies and navies, will be found in other parts of this volume (see Armstrong Gun, Darmeren Gun, Lancaster Gun, Whitwork Gun, DEDMANCE, ARTHLERY, &c.), the present article will be devoted to a description of the method used at Woolwich and elsewhere for casting, boring, and finishing brass and iron cannon of all descriptions. It sems possible that the old method of casting guns will be superseded by the manufacture of guns out of twisted bars of wrought iron, as adopted by Sir William Armstrong; for, despite the efforts of all who wish to detract from the merits of these admirable weapons, their superiority over cast-iron guns, in many respects, has been clearly proved by the severe proofs to which they have been subjected. Nevertheless cast iron, in the improved methods of preparing it, combines very great hardness and tenacity, and is chesper than any other material. As formerly mannfactured, it was very uncertain in its character, often being far from homogeneous in texture, and, at the best, its estimated capacity of resistance being only Dest, its estumated capacity of resistance being only 20,000 lb, to the square inch, whilst the tenacity of bronze was estimated at 30,000 lb. Wrought iron pos-sesses the greatest tenacity, but is inferior in hardness. The greatest objection to its use, as is urged by the best American authorities, who manifest great par-tiality towards cast-iron ordnance, is the difficulty of constructing large masses of iron by continual re-beating and forging, as new pieces are added, without causing portions to change their texture and undergo a partial crystallization; thus weakoning the mass without any sign of this change being visible. According to some experiments made for the United States government, the greatest tenacity of cast iron was 45,870; its greatest density was 7.400. The greatest tenacity of wrought iron was 74,592; its greatest tenacity of wrought from was /25,002; 118 greatest density, 7:58. The greatest tenacity of bronze was 56,786; its greatest density, 8:953. The greatest tenacity of cast steel was 128,000; its greatest density, 7:962. It is difficult to say to what extent the improvement of these engines of war, and the defensive armour-plates of vessels and floating fortresses, will be estried. An account of the results of the experiments made in order to test the penetrating powers of the best constructed cannon when fired against targets consisting of armour-plate, teak, and inner coating, will be found under the article TARGET. In casting bronze guns, an alloy is made of nine parts of copper to one of tin; but the proportion of tin is generally increased for large guns and lessened for small ones. For iron guns, the metal obtained in Staffordelire and Monmouthshire is in no way inferior to the best Swedish iron. The principal part of the casnon used in the British service has been cast by the Carron and Low Moor companies, and other private firms; but the government have lately estab-lished a foundry at Woolwich, to avoid the necessity

by nuts and screws passing through flanges projecting from the sides. As it is built up round the model from the sides. As it is built up round the model piece by piece, the interrening space is filled with sand, mixed with a little clay and water, and rammed tightly together. The model and the mould of sand around it sogemer. The model and the mould of sand around its are made much longer than the actual length of the gun, that the whole of the gun may consist of good metal. The piece that projects from the muzzle when the cesting is finished, in consequence of this, is called the dead-head," and is cut off in a lather it contains the soum and impurities of the molten metal, which always rise to the surface when it is poured into the mould, The dead-head is also useful in supplying the shrinkage arising from cooling, when the metal contracts shout 37 of an inch in every foot. When the mould has been dried in a store, the outer casing and model are removed, and the mould itself separated in pleas, which are carefully built together in a vertical position, and imbedded in a surrounding mass of sand to receive the molten iron. The metal, selected for its toughness and hardness, is then fused in a furnace with coal, and, when liquid, is allowed to run into the mould which has been prepared to receive it. When the casting is thoroughly cooled, the dead-head is cut off, and the axis of the piece exactly found by the aid of the centering-machine. As soon as this operation has been performed, the gun is removed to another lathe, and the rings at the muzzle and breech, and those on either side of the trunnions, are carefully turned. Great nicety is required in this part of the process, for the formation of the bore is regulated by these rings. The gun is then raised by means of points resembling cones, that enter the centerings, to admit of the trunnious being turned by the action of the trunnioning machine; after which the holes that receive the tangent-scale, and the bush of copper through which the vent is bored, are cut by means of a drill. The hole in which this copper plug is screwed enters the hote in which this copper plug is acrewed enters the bore diagonally. The process of boring is next performed; the gun is placed in a boring-machine in a vertical position, and the boring effected by means of a very hard and sharp steel tool, which works at the end of a long iron bar, somewhat after the manner of a centrebit. Sometimes the gun is made to revolve, and to rise gradually as the interior is cut away by the boring-tool; and in other methods the gun is fixed, and the cutting-tool revolves. The exterior of the gun is then finished off, and it is afterwards taken to the proving-chamber. A somewhat different method is used at Woolwich for forming the models and moulds of the brass or bronze gens that are cast there. Each model is formed in three separate parts; the central part, from the case-ring to the middle of the dead-head, is made on a piece of wood less in diameter at one end than the other, that it may be readily pulled out when recasion requires it. Straw is now wound round this wooden centre, and an exterior coating of moistened sand, carth, and horse-dung put over the straw. The whole mass is made to revolve against a board out in the form of half the longitudinal section of the gun, which moulds the composition to the required shape. The model of the breech is made on a cone of iron in a similar manner, and pieces of wood are affixed in the proper places to represent the trun-nions, vent-piece, and tangent-scale. This model is then coated with a composition of sand and hair, which forms the mould for the required cannon. The model is then taken out by degrees, the wooden centre being first pulled out, and then the straw which surrounded this centre; the composition forming the exterior of the model is next removed by the action of fire, the horse-dung having the property of making the com-position light and friable; and the hollow mould, when dried, is ready for use. When the mould is put in the castog-pit, the three separate pieces in which it has been made are carefully built together and imbedded in sand, as in making the moulds already described for iron ordnance. Prior to 1750 cannon were cast hollow, of being entirely dependent on private enterprise. The solid piece and boring them afterwards was discovered first thing to be done in making a cannon is to be not be solid piece and boring them afterwards was discovered by a Swiss engineer. As the exterior cools before the interior, it is found to be of much closer grain than the part which is subsequently removed; and, on this made of iron, is set upright, and surrounded with a count, cannon made on this system were som discovered to be far superior to gues which were cast but about this date the method of casting them in a

hollow, the metal of which was more porous, and, consequently, much weaker in some parts than in others; and as it did not offer a uniform resistance to the force of the powder in every part, the piece was liable to burst at any time. The following are some of the largest and most remarkable cannon ever constructed:—1. A cannon used by Mahomet II. at the siege of Adrianople in 1463, which fired bells of stone of 600 lbs. weight. 2. A cannon at Ehrenbreitztein, on the Rhine, made in 1529: it is rather more than 18 feet long, and 18 inches in the bore. It requires a ball weighing 180 lbs. 3. The mouster cannon cast by Aurungsebe in India in 1685, named the "Lord of the Plain," which is 14 feet long, 28 inches in the bore, and will fire a ball weighing 1,600 lbs. This gun is to be seen at Bejapoor, with another iron gun of similar calibre. The mould in which it was cast is said to be in existence at Ahmednuggur at the present day. A. The huge wrought-iron gun made by Messrs. Horsfall, at Liverpool, in 1856, and presented by them to the British government. It is just 16 feet long, and weighs nearly. 22 tons. The curious brass gun at Bover Castle, known as Queen Elizabeth's pocket pistol, cast in Holland, and presented to her by the Dutch states, is a beautiful specimen of the ordnance of that period.—Ref. Endish Cyclopadia—Arts and Sciences.

"Ref. English Cyclopædia—Arts and Sciences.

Canor, kå-noo' (Fr. canot; Span. canor), a boat much used by rude nations. It is generally made by excavating the trunk or body of a tree, and then cuting or burning it into a suitable shape. Sometimes it is made of bark or skins. Some cances have decks, and are moved by sails made of rushes or skillegrass; some are large enough to earry twenty to thirty hogs-



CAMOR.

heads of sugar. They are, however, generally small in width, with barely room for two men to sit abreast: the length varies greatly. The cance is generally as open boat rowed with paddles instead of oars. As the remains of cances have been dug up in various parts of the United Kingdom, it is evident that they were much used by the ancient Britons.

Canon, Rin, is a word derived from the Greek, and used in various senses by ecclesiastical writers. Its original meaning, and that in which it is used by the apostle Paul, is rule:—"As many as walk according to this rule (Gr. canon), peace be on them and meroy."—(Gsl. vi. 16.) Hence it came to be applied in the carly Church to a law or rule, either of doctrine or discipline, enacted by persons of authority in the Church, as popes, bishops, councils. Thus we speak of the canons of the council of Nice, the canons of the council of Trent, meaning the decisions of these councils on points of doctrine or discipline submitted to them. The number of canons is very great, the collected body of them forming what is called the Canon Law (which see). The Apostolical Canons are generally believed to have been issued at a very early period, and are by some referred even to the time of the apostles themselves; whence their name. Canon was also applied to a catalogue of all the things belonging to the Church, or to a catalogue of saints acknowledged and canonized by the Church, also a book used in the service of the Church, as a collection of hymns which were to be sung on festivals. More recently it came to be applied to the divine and inspired writings; in which sense we speak of the canon of Scripture, the canonical books of the Old and New Testaments. (See Bible.) Canon is also applied to the book of laws and rules to which persons are subject who devote themselves to a religious life. These rules were frequently read over to such persons, and to them also the term canon came to be applied; thus, the Augustinian canons were those who adopted

and lived under the rule of St. Augustine. The Peachal canon is a table of the movable leasts, showing the day of Baster and the other feasts depending on it for a cycle of nineteen years. Canon is also applied to that part of the communion service or mass of the Roman Catholic church which follows immediately after the Sanotus and Hosanna, corresponding to this part of the service of the English church which begins at the prayer, "We do not presume." &c. CANON, is one who possesses a prebend, or revenue allotted for the performance of divine service in a

cathedral or collegiate church. The institution of this order is not ancient, being attributed to Chrodegangus, a bishop of Metz about the middle of the 9th century. At first they were merely inferior ecclesisatios, living in community by the cathedral, and assisting the bishop in his duties, entirely dependent on his will, and supported by the revenues of the bishopric : at first, the ported by the revenues of the manopric; at mist, they even inherited his movables. By degrees they shock off their dependence, and formed themselves into sensate bodies, of which, however, the bishops were still the recognized heads. In the 10th century there were establishments of this kind formed even in cities where establishments of this kind formed even in cities where there were no bishops, and these took the name of Congregations, or Colleges, the members being called Collegiates. The name chapter now given to these bodies was not in use till long after. In time, the canonical or collegiate life became so common that every cathedral had its chapter distinct from the sent of the clergy. They gradually relaxed in their observance of their roles, and at length they caused to live in community; yet they still formed bodies, making themselves as a necessary council of the lighton examine the rights of the rest of the elergy. making themselves as a necessary council of the bishop, assuming the rights of the rest of the elergy, and taking upon themselves the administration of a see during its vacancy, and the election of a bishop to supply it. There were even some chapters exempt from the jurisdiction of the bishop, and owning no head but their dean. After the example of cathedral chapters, collegiate ones also continued to exist as chapters, collegate ones also continued to exist as bodies after they had ceased to live in communities. Canons were of various kinds; as, cardinal osnons, who were attached, in cardinals, to a church, as a priest is to a parish; domiciliary canons, such as, not being in orders, had no right in any particular chapters; expectative canons, such as, without having any revenue or prehead, had the title and dignity of canons, a voice in the chapter, and a place in the choir till a prehend hould become vacant. Experimental canons were such as should become vacant. Foreign canons were such as did not officiate in the canonries to which they belonged, and were opposed to mansionary or residentiary canons. Lay or honorary canons were persons among the laity who, out of honour and respect, had been admitted into some chapter of canons. Tertiary canons, or such as had only a third part of the revenues of the canonicate. Regular canons were such as lived in canonicate. Regular canons were such as itsed in community, and, like religious communities, had, in process of time, added the solemn profession of vows to the practice of their rules: they were called regular to distinguish them from secular canons, who abandoned living in community, and mixed more or less with the world, but at the same time practised a religious life according to the rules of the order. The order of regular canons of St. Augustine was brought order of regular canons of St. Augustine was brought into England by Adelwald, confessor to Henry I., who erected a priory at Nostal, in Yorkshire, and obtained for them the church of Carlisle as an episcopal see, with the privilege of choosing their own bishop. They were singularly protected and encouraged by Henry I. and by Queen Mand; and it appears that under the reign of Edward I, they had fifty-three priories. This institution was carried at the time of the Referention. reign of Lowert 1, they had nily-taree profess. This institution was spared at the time of the Reformation, and it continues to the present day. Canons are sometimes called probeudaries from their being in the enjoyment of a prebend; they have stalls in the cathedral churches, which are generally called probends stalls. They are still nominally what they once actually were. the council of the bishop for the administration of the affairs of his diocese; and they constitute the chapter of the body known as the Dean and Chapter. (See DEAN.)

CANON, a vocal composition consisting of two, three, or four parts, in which he several voices begin at fixed intervals consecutively; sometimes each voice commences with the same, sometimes with different ages.

## Canon Law

Canons may be finite or infinite; the former end, like other compositions, with a undence, while in infinite examps the theme is begun again before the parts which follow are concluded. They are so constructed as to form aperpetual fague, but differ from ordinary fague; for in the latter it is sufficient for the subject to be repeated occasionally according to the laws of counterpoint, while in the former it must be strictly repeated by all the succeeding parts. In ancient music canons were rules for determining the intervals of notes. Ptolemy, rejecting the Aristoxenian method of measuring the intervals in music by the magnitude of a tone, thought that they should be distinguished according to the ratios or proportions which the sample

cording to the ratios or proportions which the sounds terminating those intervals bear to one another when considered according to their degree of acuteness or gravity, which, before Aristoxenus, was the old Pytha-gerean way. From this canon Ptolemy and his fol-lowers have been called Canonic, as those of Aris-toxenus were named Musici. Amongst the ancient Greeks this term signified what we now call a mono-

Caror Law, is a body of Roman ecclesissical law considered with respect to any intrinsic obligation, has no force or authority in this kingdom; it is no face binding in England than our English laws are binding at Rome. But, as far as this foreign law, on account of some peculiar property, has in some particular cases and in some particular courts been introduced and allowed by our laws, so far it obliges, and no further, its authority being wholly founded upon that permission and adoption. Wherever the system of canon law departs from the rules of our common and statute law, the latter take place of the former. The decrees and canons of the Church of Rome were adopted, as they then existed, by the clergy and people of England so early as the year 605. About the middle of the 12th century,—butsaid by Godolphin to have been in the year 1230, a system of laws under the influence of successive popes began to be compiled and promul-gated at different periods. This system has been generally diffused through Europe, and prevails with more or less authority in different countries under the title of the Canon law. It consists of two principal parts,—the Decrees and the Decretals. About the year 1150, that which is called the Decrees, or Decretum, having been first collected by Ivo, bishop of Carnat, Pope Eugenius, who allowed them to be read in schools and alloged for law. This is the most ancient work, as beginning from Constantine the Great, the first Christian emperor.—(Ridley's View of Civil and Ecclesiastical Law, p. 74, et eq.) The Decretals are canonical epistles written by the popes, or popes and cardinals, for determining some matter of controversy. These were compiled by Raymundus Barcinius, chaplain to Greatow IX and multipled at his command about the Gregory IX., and published at his command about the year 1231, to which Boniface VIII. added a sixth book in 1298. The Clementine Constitutions, which appear to be intended as a continuation of the Decretals, were be intended as a continuation of the Decretals, were sompiled by Clement V., and published by his successor, John XXI., at Avignon, in 1317, who afterwards collected some further constitutions, which were published about the year 1340.—(Ridley, i.b.) A seventhese of Decretals and a book of Institutes were added by Gregory XII., under whose sanction the Corpus wars Convenics, containing all the several parts, was published in 1580. The Decrees appear to set out the origin of the canon law, and the rights, dignities, and degrees of ecclesiastical respons, with their manner and degrees of ecclesisatical persons, with their manner of election, ordination, &c. The Decretals contain the law to be used in the ecclesiastical courts. body of esnonical law of foreign origin must be added the constitutions passed in this country by the pope's legaces. Otho and Othobon, and the prelates of England, assembled in national councils in 1237 and 1269, and assembled in national councils in 1237 and 1269, and confirmed by the queen, they were, by royal authority, also the constitutions framed in provincial synods under the authority of successive archivishops of Canterbury and tensmitted to the two provinces of Canterbury and the sample of Canterbury and the confirmed by the queen, they were, by royal authority, tensmitted to the two provinces of Canterbury and the two provinces of Canterbury and tensmitted to the two provinces of Canterbury an

# Canons of the Church of England

sentence, endeavour to enforce obedience to such part of the canon law as was inconsistent with, or opposed to, the common law, the courts at common law, upon complaints made, would grant prohibition. The authority vested in the Church of England of making canons ruy rested in the Church of England of making-canons was ascertained by the statute of 25 Hen. VIII. 8, 19, commonly called the Act of the Clergy's Submission, by which they acknowledged that the convocation had always been assembled by the king's writ; so that, although the power of making canons resided in the clergy met in convention. clergy met in convocation, their force was derived from the authority of the king's assenting to and confirming them. The old canons continued in full force till the reign of James I., when the clergy, being the reign of James I., when the deergy, seeing assembled in convocation, the king gave them leave.to treat and consult upon canons, which they did, and presented them to the king, who gave them the royal assent. These were a collection out of the several preceding canons and injunctions. Some of these canons are now obsolete. In the reign of Charles I. several canons were passed by the clergy in convocation. A most elaborate history of the canon law will be found in the historical introduction to Ayliffe's Parergon.

Canoss, Book or, in Scottish Eccl. Hist., was a code of canons or laws prepared by the Scottish pre-lates, and confirmed under the great seal by letters-patent bearing date May 23, 1635. These canons were Scotland, and enjoined adherence to the liturgy, which had not yet been published or even prepared. They decreed excommunication against all who should deny the king's supremacy in ecclesiastical matters, or that should dare to say that the liturgy (unpublished) contained anything contrary to the Scriptures. No general assembly should be called but by the king; no ecclesions siastical business should be discussed, except in the prelatic courts; no private meetings should be held by ministers for expounding the Scriptures; and on no occasion, in public, should a minister engage in extempore prayer. Great indignation was felt all over Scotland when the character of these canons came to be known; and though it did not then break out into positive violence, it added greatly to that deep undercurrent of feeling which soon afterwards broke out with such violence.

CANONS OF THE CHURCH OF ENGLAND. kan'-ons. Bre certain laws and constitutions made for the government of the Church, and which have received the assent and confirmation of the kings of England. Even when the papal power was most dominant in England, from the time of William 1. to the Reformation, the Church had no power to enforce any canons or constitutions which had not received the royal assent. The canons in force at the time in England were all collected, explained, and systematized by Lyndwood, dean of the Arches in the reign of Henry VI. It was intended to reform there canons soon after the Reformation, and Cranmer and some other commissioners were appointed for that purpose by Henry VIII, and Edward VI. The work was completed; but the king dying before it was confirmed, it still remains unconfirmed. The book is called "Reformatio Legum Ecclesiasticarum ex authoritate Regis Henrici VIII. inchoata, et per Eduardum VI. These canons are still binding, and are acted provecta." upon in the ecclesiastical courts, except where they are superseded by subsequent canons or by acts of parliament. Another book of articles or canous was made at a provincial synod in London, April 3, 1571, by Parker, archibishop of Canterbury, and the rest of the bishops; but it is not said to have been confirmed by royal authority. In the 27 Eliz, certain canons were agreed to by the archbishop and bishops at a provincial synod at London, Nov. 24, 1534, and after-wards confirmed by royal authority. Other canons and constitutions were treated of by a provincial synod and constitutions were treated of by a provincial synoic of Canterbury, and being afterwards approved of and confirmed by the queen, they were, by royal authority, transmitted to the two provinces of Canterbury and York, and published for the due observance of them. In 1603 a synoic assembled at London, under the archibishop of Canterbury, in terms of a writ issued by

Canonica

Canopus

convenient for the honour and service of God, the good and quiet of the Church, and the better government thereof, to be from time to time observed, per-formed, fulfilled, and kept by the whole clargy. These canons are 141 in number, and are for the most part a digest of old canons, with some new ones added. They treat-1. Of the Church of England; 2. of divine ser vice and administration of the sacraments; 3. of mininters, their ordination, function, and charge; 4. schoolmasters; 5. things appertaining to churches; 6. churchwardens and side-men; 7. parish clerks; 8. ecclesiastical courts; 9. judges ecclesiastical and their surrogates; 10. proctors; 11. registrars and apparitors; 12. authority of synods; forming the basis of the ecolesinstical law as bearing upon the clergy, but not binding upon the laity, except in so far as they are declaratory of the ancient canon law. In 1640 the convocation then assembled passed a body of canons, which were ratified by the king under the great seal the same year; but being of a very arbitrary nature, an attempt was made at the time to set them aside, on the plea that the convocation could not lawfully continue its session after the dissolution of parliament. The opinion of the judges at the time was unanimously in favour of the legality of the proceedings; but they were unanimously rejected by the Commons, and, by an act passed in the 13th year of Charles II., they were abrogated.

—Ref. Hook's Charch Dictionary.

CANONICE, or CANONICES, kin-on'.i-se, was a name given to ecolesiastical virgins, from their being

enrolled in a canon or catalogue of ecclesiastics. They differed from monastic virgins in not being confined to a choister, but in living ordinarily in the houses of their

parents.

CANONICAL, kan-on'-e-kal, of or belonging to the cauous of the church. Canonical hours are certain stated times of the day assigned to the offices of prayer and devotion, "that all Christians throughout the world might at the same time join together to glorify They are observed principally among Roman cros. They are conserved principally among Roman Catholics, and are prime, torce, sext, and nones—the first, third, sixth, and uinth hours of the day; i.e. at six, nine, twelve, and three o'clock; vespers in the evening, at six; complin, as completing the services of the day; and matins and laude shortly after midnight. In England the canonical hours are from eight to twelve o'clock, before or after which marriage cannot be legally performed in any parish church. Canonical letters, in the ancient church, were testimonials of the orthodox faith sent by the bishops and clergy to each other in order to keep up the Catholic communion, and to distinguish Christians from heretics. Canonical life, the method or rule of living prescribed by the ancient clergy who lived in community. Cononical obedience is that submission which, by the ecclesiastical laws, the inferior clergy are bound to pay to their bishops, and religious persons to their superiors. In the Church of England every clergyman takes an oath of canonical obedience to his hishop when he is instituted to a benefice or licensed to a cure. Canonical punishments are those which the Church has in its power to inflict, sa in Roman Catholic countries excommunication penunce, and the like. Canonical sins, in the ancient church, were such as were deemed capital or mortal;

as idolatry, nurder, hereay.

Canonici, kim-on-i-si, a term applied in early times to the clargy, from their names being carolled in a canon or catalogue of some church.

CANONICS, or CANONICA, kin-on'-iks, the name applied by Epicurus to his system of logic, as consisting only of a few rules or canons. He rejected the dis-lection of the Stoics, as full of vain subtilities and deceits, and fitted rather for parade and disputation than for directing the understanding in the pursuit and attain-ment of truth. Canonics treated of the means by which knowledge, both physical and ethical, was obtained, and of the conditions or criteria of truth. These conand of the conditions of ordered of truth. These conditions, seconding to him, were sensations, ideas or imaginations, and affections. From these three sorts of consciousness we get all our knowledge, which is either physical or moral: the former perceived by the sense, the latter by the understanding. In reality his causaies correspond very much to what is now termedpsychology.

Esmonicum, kän-on'-e-kum, in a ganeral sense, de-

notes a tax or tribute. It is more particularly in the Greek church for a fee paid by the clean bishops, archbishops, and metropolitans, for degree and promotions. It is also applied to the first am paid by the Greek laity to their bishops or prients, a which is regulated according to the number of hem or fires in a place.

CANONIST, Ein'on-ist, is a person skilled in, or was professes, the study and practice of the canon law Canonists and civilians are usually combined in the aame persons; and hence the title of juris stringer. doctor, or legum doctor, which is usually expressed by J.U.D. or LL.D.

Canonization, kin-on-i-zai'-shun, in the Roman Catholic church, is a ceremony by which a deceased person is enrolled in the canon or catalogue of the Canonization was not known in the Christian church till about the middle of the 10th century, and it seems to have been borrowed from the custom among the Greeks and Romans of deifying the more distinguished of their great men and haroes. It pro-bably took its rise in the practice of the Church invoking the aid of early martyrs. The hishops at first decides who were entitled to this honour, and afterwards who was at first a mere local decision came to be converted into an imposing ceremony, and the power of conferring this honour was appropriated by the population Alexander III., in 1170, pronounced it an exclusive privilege of the papal chair. At first none but marries were admitted into the category of saints; but afterwards men of distinguished piety were admitted to this honour; and in later times the pope assumed the right of admitting also such kings and potentates as had greatly favoured his temporal interests. Now, steps can be taken towards canonization until fifty ye after the person's death; but formerly there were no restrictions in this respect, and the honour was frequently obtained through family interest or the intrigues of friends. A few pretended miracles at the tomb were sufficient to give one a claim to have his name inscribed among the saints. Since the time of Benedict XIV., an official, known as l'ovvocato del Diavolo (the Devil's advocate) is employed, whose business it is to sift the evidence brought forward, and to endeavour to oppose the admission of the candid The first step towards canonization is beatification (which see). After beatification has been obtained, new suit is necessary in order to obtain the canonica-tion of the same individual. For that purpose, the pope holds four consistories. In the first he causes the petition of those who request the canonization to be examined by three auditors of the rota, and directs the cardinals to revise all the necessary instruments; in the second the cardinals report the matter to the in the second the cardinals report the matter to the ope; in the third, which is in public, the cardinals pay their adoration to the pope, and the Devil's advecate makes his appearance, raising doubts as to the genuineness of the miracles, and exposing any want of formality in the procedure. On the other hand, another advocate makes a pompons oration in praise of the candidate, and expaniates at great length on the miracles which he is said to have wrought. In the fourth consistory, the pope, having summoned together the cardinals and prelates, orders the report concerning the deceased to be read, and then takes their votes whether he is to be canonized or not. On the day of the canonization the church of St. Peter is hung with rich tapeatry and most brilliantly illuminated, while the pope and all the cardinals officiate in white. The ceremony, which is very magnificent, and presided over by the pops in person, is very expensive, and

CANONEY, or CANONICATE, kint on re, is the name of the office filled by a canon. A precend may exist without a canonicate; but the canonicate inseparable from the precend. It is the canonicate that gives the right of suffrage and other privileges to the canon, and

not the prebend.

Canopus, kd-no'-pus, a very bright star of the first magnitude in Argo, a constellation of the southern hemisphere. The origin of the name is uncertain; but it was probably derived from the ancient Egyptina city. Canopus, or Canobus, which was situated on one the mouths of the Nile called the Canopic mouth, show three miles distant from the modern Aboukir.

Canopy

Canticles

CAROPT, kān'-o-pe (Gr. konopeion, from konops, a gnat), word meaning in its original sense a covering similar to the mosquito curtains of India, to protect the sleeper from those insects. Subsequently the term canopy was applied to any ornamental covering above the head, for the purpose of distinction, honour, or adornment. for the purpose of distinction, nonour, or subminimization this sense the word is synonymous with the term baldachin. (See Baldachin.) In Arch., it is applied to the coverings that project from the surface of the wall above the heads of statues placed in niches and to the directories over windows. over altar-tombs, and to the dripstones over windows when elaborately carved. Magnificent specimens of canopies are to be found over the tombs of some of our kings, and over the bishop's throne in many of our ca-thedrals. The canopy is a peculiar feature of Gothic architecture, belonging principally to the Decorated English and Perpendicular English styles. The canopies that are found over altar-tombs are generally formed by a flat roof supported on pillars at the sides, with a series of beautifully-carved arches running from pillar to pillar in the front. Those formed in recesses are often groined and adorned with pendants. Some canopies, particularly those erected over bishops' tiers most elaborately chiselled, and terminate in a spire adorned with crockets and a finial.—Ref. Parker's Glossary of Architecture.

CANT, kant, is a term to which various derivations

have been assigned. By some it is derived from the Latin cantus, sung; by others from quaint; and by others from Andrew Cant, a rather prominent Scottish divine of the 17th century. It denotes a quaint affected manner of speaking or writing, or the speakamended manner of speaking or writing, or the speak-ing in a whining, affected tone of voice. It is more particularly applied to a peculiar manner of preach-ing, praying, or begging. It also denotes the fre-quent use of phrases not well understood; or the use of terms of a particular profession or class of indi-viduals. So, givey cut. It signifies also the selling or viduals; as, gipsy cant. It signifies also the selling or bidding at an auction.

CARTABRI, kan-tai'-bre, in Ancient Hist., the name of a rude people of Spain, inhabiting the mountainous districts between Palencia, la Montaña, and Asturias, to the shores of the Bay of Biscav, which, after them, was called the Cantabrian Sea. They are described as resembling the Scythians and Thracians; and by their bravery they maintained a six years' contest with the Romans, begun by Augustus and concluded by Agrippa (B.C. 25-19). A portion of the people still remains: (B.C. 25—19). A portion of the people still remained unsubdued in their native fustnesses, and from these the Basques of the present day are believed to have

CANTATA, kan-ta'-ta" (Ital., from cantare, to sing), in Mus., an elegant species of vocal composition, of which there are several kinds, supposed by some to have been invented by Barbara Strozza, a Venetian lady, about the middle of the 17th century, while others attribute its invention to Giacomo Carissimi, pontifical Leonaida of an intermixture of maestro di capella. It consists of an intermixture of air and recitative, and was at one time extended to such a length as to form a sort of small opera, but is much a length as to form a sort of small opera, but is now, however, ordinarily written for only one voice with a therough base, though sometimes for several, accompanied by one or more instruments. In Italy, companied of great length, accompanied by a numerous band, are usually performed on great occasions of festivity, such as the reconciliation of princes after. a long disunion, or the arrival of great personages in the capital of a state. But these differed essentially from what is usually understood by a cantata, or mosologue, consisting of short recitatives and two or three airs at most, as they are occasionally poems in which several singers are employed. According to Du Cange, the word cantata was used in the Church as early as the year 1314 to express what is at present understood by anthem, with which word it is still synonymous in Germany, cantatas being chiefly confined, in the

bidden in 1847. The canteens are rented from govern ninden in 1847. The cantesis are rented from government: it is to be hoped that soldiers' club-houses will soon be substituted for them. The term canteen is also applied to a chest in which officers carry plate, spirit-cases, teg, sugar, and other requisites; and to a small wooden vessel, or cask, made of oak, slung by a small wooden vessel, or cask, slun strap over a soldier's shoulder, and used to carry water or any other liquor when on the march. They hold about three pints. They are painted blue, and marked with the number of the regiment and letter of the company to which the owner belongs

company to which the owner belongs.

Canter, kin'-ter, the movement of a horse going at a moderate gullop, when the fore feet are raised nearly together, with a leap or spring. The name is derived from the easy pace and gentle gullop with which the pilgrims were in the habit of traversing the roads to

phyrims were in the name of traversing the roads to the shrine at Canterbury. CANTERBADIN, kān-thā'-rā-din, the crystalline blis-tering principle contained in the Cantharis vesicatoria, or Spanish blister-fly, first obtained by Robiguet. procure it the flies are digested in alcohol. The alcoholic solution is afterwards evaporated to dryness, and washed with cold ether, which dissolves out the cantharadin. When pure, it is insoluble in water, but very soluble in boiling alcohol. Lard containing one five-hundredth of cantharadin will produce a very powerful bilistering offest when you'ld to the hundredth. blistering effect when applied to the human skin.

CANTHABIDE, kan-thar'-e-de (Gr. kuntharos, a beetle), CARTHARDE, Kent-tuar -e-de (Ur. Kaunauros, s Decky), the name given to a fam. of coleopterous insects, very numerous, much variegated in colours, of moderate size, and generally living on vegetable substances, They are distinguished by the head being dilated behind the eyes, and then suddenly narrowed into a short neck. When slarmed, they counterfeit death; and some varieties at the same time emit a thick yellowish fluid, with a disagrecable smell, from the arti-culatories of the legs, &c. Many species are employed externally in medicine to produce blisters, as they possess strong vesicating powers. They are also used internally as a powerful stimulant. Many species of the gen. Cantharis which possess this property are natives of Europe, India, and America. The Cantharis vesicatoria is the common blister-fly of the shops. (See BLISTER-FLY.) The striped cantharis is a native of North America, where it is called the Potato-fly. The gen. Mylater contains several species, which have properties to those possessed by the Cantharis; and the Markoe has also various species which have all the properties of the hister-fly.

Canticus, kin'te-ile (Heb., Song of songs), a name frequently given to the Song of Solomon, the 22nd in order of the books of the Old Testament. There is no other inspired book concerning which so much diversity of opinion has been entertained. In modern times many attempts have been made to deny the canonicity of this book, not so much on historical or critical grounds, but from the subject of the book itself. The ancient Jews, without exception, regarded it as a sacred book, and it is cited as of divine authority from the earliest times of the Christian church. As to the authorship of the book, some have maintained that it is not the work of one, but of several authors, or a collection of early songs made by some later hand; others that it belongs to an age much later than that of Solo-mon. The book itself professes to be the work of

Solomon, and the unanimous testimony of tradition is in support of this view. There are also in it frequent allusions to the time and circumstances of Solomon, a time when the kingdom was in peace and power, while the profusion of its imagery, gathered from foreign as well as domestic scenes, shows it to have been written at a time when the Jews had extensive intercourse with neighbouring nations, and singularly confirms the view of its being Solomon's, who had a remarkable liking for foreign grandeur. The continuity of the subject and sameness of the style, mark it as the work of one author. The interpretation of the book itself is a sub-In termany, catters being chiefly domined, in the author. The interpretation of the book itself is a subject which has given rise to much discussion. The book is an amatory poem. The assumption of a love-scaling or place within the barracks where the soldier may burdiase beer and spirits. It is under the control of the officer in command, who can regulate the analysis and see that the cantineer supplies liquor of a practises no imposition on his customers. The sale of spirits at these places was for-Christ for his church. Luther assumed it as a political

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# Cantilever

sliegory referring to the happy consequences of Solomon's reign; and more recently it has been held to be a prophetical description of the Christian church. The German rationalists of the last century maintained the literal interpretation of this book, and this has been the prevailing opinion in that country since that time; but some of the recent expositors, as Hengstenberg, haverecurred to the allegorical interpretation. Those who interpret it literally regard it as celebrating the love of Solomon for an Egyptian princess, or for a daughter of Israel; and some consider it as setting forth the beauty of conjugal fidelity, and commending monogamy. Some orities divide the book into twelve distinct poems or idyls; others into plots of seven days, commensurate with the period of a marriage feast; while others regard it as a drama of four or six acts. According to Dr. Jahu, the book divides itself into distinct songs, as follows:—1. An innocent country maiden makes an undisguised profession of her attach-ment, and her lover replies to it with equal protestation of affection (i.2—ii.7). 2. A maiden sings of her lover, who is seeking her everywhere, and she also confesses her warm affection (ii. 8-iii. 5). 3. A maiden in a litter surrounded by Solomon's soldiers, is brought to the harem of the king. The lover prefers far before all the royal beauties his own beloved, in whose society he declares that he is happier than the king himself (iii. 6-v. 1). 4. A maiden beloved sings of her lover. He had come to her door at night, and had fied away before she opened it. She seeks him, is beaten by the watch, and stripped of her veil. She describes the beauty of her lover, who at length answers, celebrating her loveliness with a contemptuous glance at the multitude of the king's wives (v. 2—vi. 9). 5. Shalamith recounts in few words the allurements of the courtiers whom she had met with unexpectedly in the garden, and her rejection of them, and celebrates her affection for her lover (vi. 10-viii. 3). 6. Protestations and praises of constant affection (viii, 4-7). 7. A discourse between two brothers about guarding and giving away their sister in marriage, who replies with scorn that she would be her own guardian (viii. 8-12). 8. A fragment, A lover wishes to hear his beloved. She replies by persuading him to fly; perhaps, because her parents or relations were near, who, in the East, never allow such meetings (viii. 13, 14).—(Introduction to the Old Testament.) Some of these divisions are sufficiently fanciful, as indeed is the case with all the attempts that have been made of the same kind. The truth seems to be that the poem is destitute of any plan, and that it aims sin ply at placing the love of the king and his bride in a variety of aspects. With all the change of scenery there is no change of the relations subsisting between the parties who appear in each successive scene. The difference of manners between successive scene. The difference of manners between the East and West is to be kept in view in considering this song, which is also far more delicate in the Hebrew than in any Europeau dress. Allegory is even to this day a favourite mode of expression in the East, and the veiling of spiritual fervour and enjoyment under the figure of love is common to all eastern nations. Many good persons, however, in their attempts to reconcile the literal with the spiritual sense of this book, have injudiciously carried their attempts too far, and have been led beyond the boundaries which a reverence for the sacred Scriptures should ever prescribe. The Jews did not allow their youth to read this book before the age of thirty.

CANTILEVER, kän-ti-le'-ver (probably fr. Lat. cauterii

labrum, the lip of a rafter), a projection from the face of a wall, used to support baloonies and ornamental



CANTILEVEB.

cornices, answering the same purpose as a bracket, but widely differing from it in form. It is often used synony. mously with the term bracket; but, strictly

should be confined to long pieces of wood, iron, or stone, projecting for some distance from the wall, but comparatively narrow in width and depth. The prolevers. A good pictorial illustration of the term may be seen in the engraving appended to the article Bal. indeed, derived from the causes of change of the

# Canzone

The word is also spelt cantalever, cantaliver, and cantliver.

CANTO, kan to (Ital. canto, a song), a part or division of a poem, answering to book in prose.

CANTON, kan ton' (Fr. conton; Ger. kante, a corner).

UNITON, Kanton [Fr. conton; ver. kunter, a volume, a in Her., one of the nine honourable charges or ordinaries, occupying a third part of the chief, or exactly one-ninth part of the field. It is square in form, and is borne on the dexter or sinister side of the shield.

Canton (Fr. canton, a district), a term employed in Geog. to denote a portion of territory forming a sepa-rate state or government. Switzerland is divided into cantons. The arrondiscements in France are subdivided into cantons, of which there are 2,971; and these are again subdivided into communes.

CANTON'S PHOSPHORUS.—The protosulphide of cal-cium, when newly made, is very phosphorescent. This property was discovered by Canton, who first prepared this substance by calcining oystershells and mixing the whitest pieces with one-third their weight of flowers of sulphur, and recalcining them in a crucible with a luted cover. When heated for an hour, the whitest pieces were selected and preserved in well-stoppered bottles.

CANTONMENTS, kan-ton'-ments (Fr. cantonnement). In Mil., troops are said to go into cantonments when, either on account of the inclement state of the weather, difficulty of obtaining supplies, an armistice, temporary suspension of operations in the field, or other causes, the general commanding determines to quarter his troops in the towns and villages of any particular district, instead of putting them under canvas. A careful examination of the capabilities and natural position of the district is first made by the quartermaster-general and officers of engineers, and the men are then billeted in the villages and farmhouses, but kept together as closely as persible, in order to resume active opera-tions whenever it may be required. Headquarters and a main guard are established in some central and commanding position, pickets of cavalry and advanced guards are posted at outlying points to watch every approach to the neighbourhood in which the troops are placed, and everything is done that is necessary to secure the position in event of the enemy making a sudden and unexpected advance. The term cantonments is applied in India to barracks built near any large town or city for the reception of troops. They correspond very nearly to our own barracks and permanent camps, with this particular difference, that the quarters of the various troops are not contiguous, but are spread over an area of considerable extent. The are generally situated at some little distance from any town to which they are attached, and comprise quarters for European and native troops of all arms of the serthe curopean and native roots of an arms of the service,—cavalry, infantry, and artillery, with separate burgalows for the officers. Parade-grounds, magazines, mess-rooms, offices, and bazaars, are attached. The cantonments near Delhi are pleasantly situated on a rising ground to the north of the city, about two miles from the Cashmere gate. The cantonments, or lines, at Meerut will ever be remembered in Anglo-Indian bistory as the root in which the absorber Indian history as the spot in which the slaughter of European officers and their families, that so signally marked the first act of the sanguinary drama of the Indian revolt, was commenced by the infuriated mutineers.

CANTRED, OF CANTRETH, kän'-tred (Brit. cant, a hundred, and tref, a town or village), is used in Wales in the same sense as a hundred in England, denoting a certain division of a county.

Canvas, kim'-ris (Fr. canevas), a coarse material used for the sails of vessels and for the foundation of painted cloth for floors. The term is also applied to a light material woven with the warp and woof at intervals, so as to leave square interstices between them, and used by ladies for tapestry and Berlin-wool work. And used by ladies for tapesty and bernit respectively. Painter's canvas, on the contrary, is a material of very close texture, called "ticking." It is generally purchased stretched on frames of various sizes, and primed with a light neutral grey or drab tint ready for

Provençals; but the Italians were the first to give it a definite form. It received its classic stamp principally from Dante and Petrarch. With them the cauzone was any considerable lyric poem divided, like the Greek strophic ode, into stangas exactly corresponding to one another in number of lines, metre, and position of rhymes; the last stanza being commonly shorter than the others, and usually consisting of a valedictory ad-dress by the poot himself to the poem. After Petrarch the Italiana began to deviate from the strict form of the causone, among whom were Tasso and Chiabrera. CANSONETTA (Ital., dim. of cansone), is an abridged

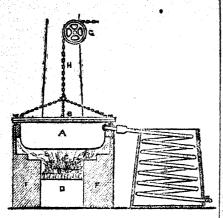
ansone written in short lines and verses.

CLOUTCHOUC, INDIA-RUBBER, or GUM-BLASTIC, kit-chook (its Indian name).—Caoutchoucisthe solidified milky juice of certain tropical plants, the largest supply being obtained from the Ficus clastica, a tree belonging to the ord. Moracea, found in Assam; from other speto the ord, Moracea, found in Assam; from other speiss of Fiess growing in Java and America; from the Siphonia elastica, a native of Guinna and Brazil; and from the Uracela elastica, a climbing plant found in the islands of the Indian archipelago. Many other plants yield caoutchouc in small quantities; such as the common fig (Fieux carica), the spurge, the dandelion, and the calandine. The milky juice of these plants consists of the caoutchouc mechanically suspended in the form of small globules in a thin aqueous fluid charged with soluble vegetable matter. In this respect it bears great analogy to cows' milk (see Milk), which is also thin aqueous fluid holding insoluble globules in mechanical suspension. The analogy is further borne out by its behaviour when left to itself. Preserved in close vessels, it separates into two portions, the more solid part, the caoutchoue, rising to the top, and formsolid part, the caoutenous, raing to the top, and forming a thick cream upon the surface. Prepared in this way it contains many impurities. The likeness borne by this milky juice to animal milk has caused it to become an article of food in several countries, and the juice of the cow-tree, or hya-hya of tropical America, the commend in large quantities by the natives of the is consumed in large quantities by the natives of the district in which it grows. The caoutehous of commerce occurs in the form of large shapeless masses collected at the foot of the tree which has been cut. or in rude cylinders formed in clay moulds. It is also imported in the shape of bottles, figures of animals, imitations of the human foot, &c. These are made by imitations of the human foot, &c. dipping a rade clay mould repeatedly into the juice and allowing the caoutchout to solidily between each operation, the clay being broken and extracted when a sufficient thickness has been obtained. Such is the raw India-rubber of commerce, the properties of which are too well known to need description. When first introduced into this country, about a century ago, its only use was to offace marks made by lead penois. Its electricity and imperviousness to moisture were well isows, but the impossibility of procuring it in large mentioned. In 1819 Mr. T. Hancock commenced experiments on its solubility in different fluids. - His est experiments were unsuccessful, and he directed his ingenuity to a process for outting the bottle-shaped masses into thin pieces, and applied them to the making of elastic bands for gloves, waistbands, garters, stays, patterns, clogs, &c. In the process of manufacture he accumulated an immense quantity of waste pieces, which he turned to use by taking advantage of the property that caoutchouc possesses of uniting when mbined into a mass by means of a machine called a marticator, which consisted of a spiked rollor working inside a hollow spiked cylinder. At first, only two ounces at a time could be masticated; but by larging his machinery he worked up large masses which could be afterwards out into sheets and blocks. He further discovered that these sheets sould be dissolved in oil of turpentine. an important discovery, leading to the invention of waterproof cloth by Mr. Charles Macintosh. The method by which this was effected consisted in cementing together two surfaces of catton-work cloth ans of the esoutchouc solution. This formed a given the name of Macintosh. Mr. Hancock continued milding experiments on the liquid caoutchous imported from Peru, but found be could use more successfully

the solution above named. The uses to which the solution was applied are so numerous that it would be impossible to mention the whole of them. In 1831 a method of making clustic fabrics, having threads of enoutchouc in the warp or west, was introduced. The manner in which the threads were formed is ingenious. A round flat disk of caoutchous was made by cutting a bottle into halves and subjecting them to pressure; the disks were then cut into ribbons by a knife revolving spirally, the ribbons being afterwards sliced into square threads by another machine containing a series of cut-The shreds thus prepared were stretched to their full extent while warm, and, being kept in a state of tension until they were cool, it was found that they did not spring back to their original length until once more heated. The stretched thread was covered with cotton, and used as the warp of the labric into which they were made. When woven, the labric was beaten, which caused the caoutchout to relax, reassuming its clustic condition. Caoutehoue continued to rece numerous applications in manufactures, civil and mechancal engineering, domestic appliances, and surgical instruments, until 1842, when the most remarkable discovery in relation to this material was made by Mr. Goodyear, an American inventor. In this year an agent of this gentleman brought to England a few specimens of caoutchouc which had been treated so as to lose its three great detects of hardening by cold, becoming sticky and relaxing by best, and dissolving in oil and grease. The new material also possessed greater toughness and almost perfect elasticity. The inventor wished to sell his invention; but as the process was not communicated, English manufacturers declined to treat. The indefatigable Mr. Hancock at once set to work to produce a similar material, and after expending much time and labour in investigating the matter, he discovered a means of combining caoutchour with sulphur, producing the substance known as rulcanized India-rubber. Since that period various methods have been devised for its manufacture, by knowding certain proportions of caoutchoug and sulphur in a masticator; by dissolving caoutchoug in sulphurized oil of turpentine, which is afterwards allowed to evaporate; by dipping the rubber in a solution of chloride of sulphur in bisulphide of carbon; and several other methods more or less important. The perfect elasticity of the new material, the case with which it could be moulded into various shapes, the properties of resisting heat, cold, and solvents, soon remored its use uni-versal. Its applications to engineering purposes were most important. It soon superseded the use of metal springs for the buffers of locomotives. It replaced leather for valves and washers, and waterproof overstones began to be manufactured under Goodyear's patent by millions. Since 1842 the trade in Indiarubber articles has steadily increased, the imports having quadrupled in ten years. By combining coouchouc with sulphur at an elevated temperature, a hard, light, intensely black substance called ebonite, or valcanite, has been formed; for a description of which consult articles Ebonife and Vulcanite. (See also settles Kampulloon and Lindlews). Mr. William Hynry Barnard hus taken out a patent for a chemical solvent not hitherto used in the arts, which promises to become most serviceable, from the fact of its posseesing two very extraordinary characteristics, viz., that when in a liquid condition it has less apecific gravity than any other substance yet known to the chemist, being considerably lighter than sulphuric ether; whilst in a state of vapour it is heavier than the most ponderous of the gases. When mixed with alcohol, it acts as a solvent of copal and all the resins, at the ordinary temperature of the atmosphere. Caout choncine, the name given to this new material, peculiarly useful for making varnishes in general. It also mixes readily with oils, and will be found a valu-able and cheap menstruum for liquetying oil-paints: and, without in the slightest degree affecting the most delicate colours, will, from its ready evaporation, cause the paint to dry instantly."—(Ure's Diet., its edition.) Mr. Barnard, in the specification of his patent, thus describes the mode of preparing excus-choucine:—"I take a mass of indis-rubber as insorted, and having cut it into small lumps, containing about two ouble inches each, I throw these lumps into

# Caoutchouc

a cast-from still with a worm attached. A is the still, B the cover, C the fire-place, D the seb-pit, E the worm-tub and worm, F the brickwork of the still, G a roller and carriage, H the chain. I then apply heat



to the still in the usual manner, which heat is increased until the thermometer ranges at 600° Fahrenheit, or thereabouts. And, as the thermometer ranges progressively upwards to 000° Fahrenheit, a dark-coloured oil or liquid is distilled over, which I claim as my said invention, such liquid being a solvent of caoutchouc and other resipous and clearinous substances. When the thermometer reaches 600°, or thereabouts, nothing is left in the still but dirt and charcoal. I have found the operation of distillation to be facilitated by the addition of a portion of this oil, either previous or subsequent to rectification, in the proportion of one-third of oil to two-thirds of escutchout. I afterwards subject the dark-coloured liquid thus distilled to the ordinary process of rectification, and thereby obtain fluids varying in specific gravity, of which the lightest hitherto has not been under 670, taking distilled water at 1000, which fluid I also claim as my invention. At each rectification the colour of the liquid becomes more bright and transparent, until, at the specific gravity of 0080, or thereabouts, it is colour-less and highly volatile. In the process of rectifica-tion (for the purpose of obtaining a larger product of the oil colourless) I put about one-third of water in the still. In each and every state the liquid is a solvent of caoutehoue and several resinous and oleaginous substances, and also of other substances, such gibous substances, and also of other same as so, such as copal in combination with very strong alcohol. Having experienced much difficulty in removing the dirt which adheres to the bottom of the still, I throw into the still lead and tin in a state of alloy (commonly called solder) to the depth of sbout half an inch, and as this becomes fused, the dirt which lies on the surface of it is more easily removed. Objections having been made to the smell of this liquid, I have found such smell removed by mixing and shaking up the liquid with nitro-muriatic scid or chlorine, in the proportion of a quarter of a pint of the acid (of the usual commercial strength) to a gallon of the liquid. Obemically considered, pure caoutchone is a carbide of hydrogen, or hydro-carbon, C.H., possessing a specific gravity of 0.02 to 0.97 (Faraday). It is prepared by dissolving the commercial material in chloroform, precipitating with alcohol, and deying at a temperature of 70° to 80° Fah. As it is found in commerce, it is a dark-brown meterial, soft and elastic called solder) to the depth of sbout half an inch, and commerce, it is a dark-brown material, selt and elastic at ordinary temperatures, hardening temporarily at about 40° Fah., and melling at 250° into a liquid having the consistency of tar, which coes not soon resolidity. It is insoluble in water and alcohol, but dissolves more or less readly in chloroform, washed ether, bisulphide of carbon, coal-tar, naphtha, benzole, and oil of turpentine. Nitric acid, sulphuric acid, and

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# Caoutohous

the alkalis, attack it but slowly. According to Payer, caoutchouc consists of two portions, one of which is soluble in the liquids above mentioned, while the other only swells and softens under their influence. Caoutchouc discovers in the fixed oils, but less its shatic properties thereby. Distilled in close results, excutchouc furnishes a mixture of several hydrocarbons, which possesses powerfully solvent properties. By careful distillation at different temperatures, this mixture is separated into liquids of different densities and boiling-points. One of these is remarkable for its low specific gravity, 630 at 25° Fah., and for boiling at a candokine to one of these hydrocarbons having a specific gravity of 842 and a boiling-point at 340°. It resembles oil of turpentine in most of its properties. Among the less volatile portions, Bouchstrat found a yellow oily hydrocarbon, which he named keedens. He also obtained tetrylene (which see); coortchesse, a liquid of specific gravity 650, which boiled at 58°, and yielded crystalline plates at 14°; and a third compound, which he considered to be expion (which see). Caoutchous, in its unvulcanized state, is most useful in the laboratory, for connecting the tubes of apparatus. Its power of resisting re-agents, and its property of cohering to form a tight joint when newly out, render it a desideratum in the modern laboratory. In its permanently-melted condition, it forms a valuable late for pneumatic apparatus. Stoppers and stopcocks lubricated with it remain movable, yet perfectly air tight. Vulcanised, it serves for gas-bags and tubes, and for many other purposes. It must, however, be used with great care, which it passes. We borrow from Mr. Buncock's work the following places:—

towing places :	cwt.	£.
West Coast of Africa	3,267	10,075
Central America	1.512	10,596
New Granada	8,806	60,982
Brazil	38,512	307,923
British India :-	•	
Bengal and Pegu	4,104	26,324
Singapore and Eastern	Ţ.	
Straits Settlements	8,141	47,902
Elsewhere	6,385	38,843
	71,027	£502,645
97		-

# Caoutchone manufacture of the United Kingdom :-

outenois ingulation of the Chica's	€.
o Russia	5,819
Norway	3.168
Denmark	3,234
Hamburg	39,189
Holland	32,875
Belgium	16,205
France	126,116
Portugal, Azores, and Mudeira	6,483
Spain and the Canaries	80,220
Italy:-	uvysau.
Sardinian States	4.422
Tuscany	3,068
Naples and Sicily	4,868
Turkey Proper.	5.262
	3,924
Egypt	0,023
North Atlantic Ports	33,628
	218
Pacific Ports	3,401
New Granada	
Brazil	4,278
British India :-	6 077
Bombay and Scinde	2,371 269
Madras	
Bengal and Pegu	6,496
Singapore and Eastern Straits	63
Settlements	185
Ceylon	
Australia	34,958
British North America	16,026
Other countries	24,907
	C419 890

# Caoutchopo Mineral

		MANAGE COL	. 471		
Toho	The import of caoutchouc-manufactured boots an aboes was, from—				
	사람들이 그 사는 그 생생이다고요?	Ib.	£.		
20	Hanover	. 55,249	2,763		
	Hamburg	. 37,516	1,676		
377	France	. 101,344	5,067		
4,575	Other parts	, 12,055	604		
21.1					
	and the first of t	202,103	£10,109		
1.7					
Oth	er kinds of manufacture :-	-			
•	Hanover	. 52,645	3,554		
Physical Control	Hamburg	. 108,629	9,645		
1	Bremen	. 16.646	1,315		
	Holland	. 102,165	5,128		
	France	102,165	5,128		
10	United States :-				
	North Atlantic ports	. 13,503	2,677		
	Brazil	86,691	7,897		
1.45	Other parts	13,215	1,993		
. 6		418,386	£35,289		
15					

## Dur exports of caoutchoue were :-

### Foreign and Colonial produce.

	cwt.	£.
To Russia	3,650	25,831
Hanover	1,216	8,003
Hamburg	2,516	17,801
Bremen	1,698	12,013
Holland	. 3,854	27,339
Belgium	803	5,681
France	8,816	62,373
United States :-	•	•
North Atlantic ports	. 4,825	34,137
Other countries	1,719	12,162
	29,107	£205,932

CAOUTCHOUG MINERAL, on clastic bituminous mineral, resembling caoutchouc in its physical properties. A few specimens of this substance have been found in a lead-mine in Derbyshire, in a coal-mine at Moxbrelais, and in bituminous limestone at Woodbury, in Connecticut.

CAR, kap (Lat. caput, the head), is the garment that covers the head. Caps were not worn by the Romans for many ages. When the rain or sun was troublesome, the isppet of the gown was thrown over the head. The the lappet of the gown was thrown over the nead. And same usage prevailed among the Greeks, where, at least during the heroic age, no caps were known. The general use of caps and hats in Europe is referred to the year 1449, when they were used at the entry of Charles VII, into Rouen. From that time they began to take the place of chaperons or hoods. When the Charles VII. into Bouen. From that time they began which it is tound. In length it usually measures about to take the place of chaperons or hoods. When the two feet ten inches. The capercallie may lay claim to comp was of relvet, it was called mortier; when of wool, simply bonnet. None but kings, princes, and knights were allowed to use the mortier. The cap was the grandeur and boldness, beside which every Gulkus head-dress of the clergy and graduates. Pasquier says domesticus sinks into insignificance. Its plumage is that the giving of the cap to students in the universities denoted that they had acquired full liberty, and black, the neck and breast black, tinged with a rich grand. The templet attice, unlike its more reasher. were no longer subject to the rod of their superiors,— in imitation of the ancient Romans, who gave a pileus or cap to their slaves in the ceremony of making them free; said hence on medals Liberty was represented as holding out a cap in her right hand. Churchmen, members of universities, students, and others, wear square caps. The French clergy wear a shallow kind of cap cape. The French clergy wear a shallow kind of capelled a calotte, which covers only the top of the head The cap was also sometimes used as a mark of infamy. In France those who had been bankrupt were obliged to wear ever after a green cap, to prevent people from

to wear ever after a green cap, to prevent people from placing confidence in them in any future transaction; and if they should at any time be found without this cap, their protection was to be null.

CAP-APTM. (See ARMED AT ALL POINTS.)

CAP OF MAINTEMANCE OF DIGNITY, an ornament of state worn by royal or noble individuals on certain important occasions. It forms part of the British regalia, and was carried before the kings of England at the coronation. A cap of maintenance is also carried before the mayors of some cities.

# Capies

CAPACITY, ka-pus'-e-te (Lat. capax, capacious), in Phil., properly denotes the susceptibility of the mind of being affected by a particular class of emotions. It signifies literally "room for," and denotes the passive power of the mind as distinguished from faculty, which is active power. It is an aptitude to receive certain modifications of our conscioueness, in receiving which we are passive. The terms power, faculty, capacity, are more appropriately applied to natural than acquired capabilities, and are thus inapplicable to mere habits.

CAPACITY, LEGAL.—The legal capacity of persons depends upon their age or condition. (As to the first, see Age.) In the second case, the law has wholly or see AGE.) partially placed infants, married women, idiots, persons of uncound mind, and some others, under its protection, absolved them from the cousequences of certain acts committed, or limited their liability under contracts entered into by them. (The subject will be found referred to under the several titles of AGE, Com-PANY, CORPORATION, CONTRACT, DURESS, HUSBAND AND WIFE, INFANT, INSANITY, MARRIAGE, and OFFICER PUBLIC.)

CAPARISONED, ki-pdr'-e-zoned (Fr.), a term employed in Her. to denote a war-horse fully furnished for the field. In the Middle Ages, horses were caparisoned in a very superb and costly manner; and in some countries the horse caparison consists of the richest and most gorgeous materials.

CAPELIA, kā-pel'-la (Lat. capella, a she-goat), in Astron., a brilliant star of the first magnitude in the constellation Auriga.

CAPERCALLZIR, or CAPERCALLE, kā-per-kail-se (Tetruo urogalius), a bird of the Grouse species, whose uppellation is of Gallic origin, and means "horse of the wood," it is also called the Cock of the wood. Formerly, this maghificent bird was an inhabitant of the British isles, being principally found in the Highlands of Scotland, but has been for some time extinct there. It prefers the pine forests of Norway and Scandinavia, in which regions it is found in abundance. Several attempts have been made to introduce this bird again into Scotland, but without any satisfactory results, although the soil and nature of the country are well adapted to the purpose. As it is, a larger number of capercaille may be found in the regions of Leadenhall than in any other part of the United Kingdom. The food of the capercaille consists of the leaves of the Scotch fir, also various berries found in the North. The young have a more luxurious diet, feeding on auts, worms, and other insects. The size of this species varies considerably; in some cases a full-grown male (which is one-third larger than its mate) will scarcely weigh ten pounds; whereas it will sometimes exceed sixteen pounds. This discrepancy is greatly owing to the latitude in which it is found. In length it usually measures about two feet ten inches green. The female's attire, unlike its more resplendent mate, is humble, and is variegated with lowish-brown, white, and brownish-black. It would seem a pity that vigorous attempts were not made once more to introduce the espercailie into the United Kingdom.

CAPERS. (See CAPPARIS.) CAPIAS, kat'-pr-us (Lat. capio), to arrest a defendant. It is of various kinds. One is a writ called capius ad respondendum, before judgment. It cannot be issued unless the cause of action exceeds £20, and is no case without an affidavit made by the plaintiff that it does exceed that sum; nor can it be issued at all unless the defendant is about to abscord; in which case, on an affidavit of the cause of action, and stating cir-cumstances to show the defendant is about to leave the country, an order can be obtained for his arrest by an application to a judge of one of the courts of common law at Westminster, or a warrant for such arrest by an application to a commissioner in bankrupter, or a judge of a county court, except the courts for Mid-

# Capillaries

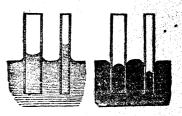
dlesex and Surrey. In either case a writ of capies must be issued; but if a warrant be obtained, the defendant may be arrested thereon without the writ, which must, however, be issued for hwith, and if no action be pending, a writ of summons also. The writ of capies must, if the debtor be in custody, be served in the state of th with the capies within seven days inclusive, from the date of the warrant. The defendant, on giving bail to the satisfaction of the sheriff in double the sum claimed. will be discharged; or, on giving bail before a judge, to satisfy the debt and costs, can obtain an order for his discharge; or he may apply to a judge of a superior court, commissioner in bankruptey, or county court judge, to have the writ or warrant set aside and vacated, if the application be made before arrest, or for his discharge out of custody if the application be made after his arrest. Another writ of capies is called capies ad satisfaciendum, and is issued on a judgment obtained in an action against the defendant, to arrest the defendant to satisfy the judgment. It cannot be issued in an action of debt unless the debt recovered exceeds £20, and the defendant cannot give bail, but must remain in prison until he be discharged under the Bankruptcy Act. (See BANKRUPT.) Another of such write is called capias ad withernam, issued in cases of distress for rent, or damage feasant by cattle, where the distress is carried out of the county or concealed, on which the sheriff might return that the goods or beasts were elvianed, elongata (carried to a distance), to places to him unknown, and thereupon the party levying could have a writ of capies in withernam, in ectito (or more properly repetitio) namio, a term which signifies a second or reciprocal distress, in lieu of the first which was eloigned. It was therefore recommand to the sheriff to take other goods of the distreinor, in lieu of the distress formerly taken and eloigued or withheld from the owner; so that there was distress against distress, one being taken to answer the other by way of reprisal, and as a punishment for the illegal behaviour of the original distreinor: for which reason goods taken in withernam could not be replevied till the original distress was forthcoming. As replevins can now be proceeded with in the county courts without writ, the old practice in such cases has fallen into desuctude. (See REPLEVIN.) It should be stated that in the old northern languages the word withernam is used as equivalent to reprisals.—(Sternhook, de Jure Sucon, I.1, c. 10.) A writ of capita pro fine, issued against a plaintiff for an amercement or fine to the crown for bringing a false action. This is abolished in some actions by 5 Will. & Mary, c. 12, and in all cases disused. The remaining writ of capies is a capies utlagatum issued against a person outlawed in any action, whereby the sheriff is commanded to apprehend him, and keep him in safe custody till the day of the return of the writ, and then have his body there to be ordered for

writ, and then have his condy mere to be ordered his contempt. (See Outlawer.)
Capitlaburs, kip-il-li-rees (Lat. capillus, a hair), in Aust., are the minute blood-vessels of the body, which form the connection between the extremities of the arteries and the voins. They vary in size from  $\frac{1}{\sqrt{3}n}$ th to  $\frac{1}{\sqrt{3}n}$ th of an inch in diameter, being smallest in the train and largest in the bones. It is in the capillaries that nearly all the changes in the blood take place. is in them that its carbonization is effected and animal heat produced, and from them that the bile, sweat, and wrine are secreted.

CAPILLABY ATTRACTION, a term applied to that part of Physics which investigates the phenomena produced when solid bodies are brought into contact with liquids. These phenomena are best observed in small tubes, about the diameter of a lair: hence the name. In all cases, although the phenomens are very varied in their mature, the result may be attributed to the mutual attraction of the liquid molecules for each other, and to the attraction between these molecules and solid substances. The following instances are examples of capillary attraction. When a solid substance is im-mersed in a liquid which wets it, as, for instance, a glass rod in water, the liquid becomes carred upwards towards the side of the solid, making its surface slightly concave, instead of being hofizontal. If, however, the liquid does not wet the solid, as, for instance, a glass rod dipped into mercury, the liquid is depressed against the sides of the solid and assumes a convex shape. The

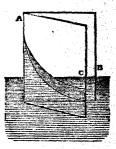
# Capital

surface of the liquid against the sides of the which contains it is also concave or convex, acc which contains it is also concave or convert it. If a to whether the liquid does or does not wet it. If a small tube, instead of a glass rod, is employed, these more apparent. The liquid phenomena become much more apparent. The liquid ascends, or is depressed, according to whether the tubes are moistened by the liquids or not, as repre-sented in the annexed illustrations. The amount of



ascent or depression is proportionately greater, according to the diameter of the tube. Gay-Lussac has demonstrated that liquids ascending or being depressed. in capillary tubes are governed by these laws. First, that a liquid ascends in a tabe when it moistens it, and that a liquid ascends in a table when it moistens it, and is depressed when it does not; secondly, that this ascent and depression are in the inverse ratio of the diameters of the tubes, so long as these do not exceed two or three millimétres; and, thirdly, that the ascent and depression vary with the nature of the liquid and the temperature, but that they are altogether independent of the thickness of the tube and the nature of the substance, provided that it is moistened by the liquid. These laws hold good in vacue as well as in air. Analogous capillary phenomena occur when two bodies of any given shape are immersed in water, provided the substance, provided that it is moistened by the liquid. bodies of any given shape are immersed in water, provided they are sufficiently near. If two parallel plates of glass are immersed in water at a short distance from one another, the water will rise between them in the inverse ratio of the separating distance. If the plates are immersed in mercury instead of water, a corre-

sponding depression is the result. If two glass plates, AB and AC, in-clined to one another at a small angle, as repre-sented in the accompanying engraving, he so immersed in a liquid which wets them that the line of contact between the two plates is vertical, the liquid will rise towards the summing of the angle of the two plates, and the curve from the highest part of the surface to the lowest will be the hyperbola. When two rise towards the summit



floating balls, both moistened by the liquid, are so near that the surface between them is not level, they are attracted towards one another. Balls that are not moistened by the liquid in which they float are also attracted in the same manner. Balls made of cork are instances of the former, and balls made of wax of the latter. If one floating ball is moistened by the liquid and the other is not, both balls are repelled. The theory of capillary attraction is one of the most diffi-cult in physics, and can only be completely treated by mathematical analysis. It has been more especially studied by Laplace, Clairont, and Poisson. The effects of capillary attraction are to be observed in many operations in nature. Insects can often move on the surface of water, because their feet are not wetted by the fluid, and a depression is caused, which buoys then up. A sewing-needle will float on the surface of water if covered with oily matter. Oil ascends in the water it covered with only matter. On ascenda in the wicks of lamps by capillary attraction, and water rises; in wood, sponge, biblious paper, and other porous substances, by the same force.

CAPITAL, kep'-ik-al (Lat. caput, the head), a term in Arch., applied to that part of the column which sus-

Capital Punishment

mounts the shaft, including the belt,—a part swelling outwards between the shaft and abacus, and the abacus itself. When the lower part of the espital assumes the appearance of being a continuation of the shaft, separated from it by an astragal or moulding, it is called the neck of the capital. In the five classic orders of architecture (see Architecture) the capitals form striking marks of distinction, and there is considerable difference in the treatment of the capital of the same order in Greek and Roman architecture, as will be seen presently.

The capital of the Tuscan order is very plain, consisting of a neck, on which is an ovolo moulding, support ing a square absous surmounted by a fillet. That of the Roman Doric is similar in form, but the neck is ornamented with rosettes and buds. The capital of the Greek Doric is far more elegant in appearance, consisting of a massive abacus supported by an echinus moulding that swells from the shaft, and is separated from it by three small amuleis. The capitals of the Greek and Roman Ionic are similar in appearance and general details. They are formed by volutes on two parallel faces, connected by curved or horizontal Between the spirals of the volute there is an echinus moulding, and, when a neck is added, it is enriched with tracery in relief. The abacus consists of an ogee moulding and fillet. The method of tracing the spiral of the volute will be found elsewhere. VOLUTE.) The bell of the Corinthian capital is richly ornamented with the leaves of the acanthus disposed in two rows, finished by four small spiral volutes in each face rising from the leaves below. Two of these curl outwards under the corners of the abacus, and two inwards, towards each other in the centre of each side. The abacus is formed of a cavetto, fillet, and echinus. The great point of difference in the Greek and Roman Corinthian capitals consists in the form given to the leaves. In the former they are pointed, and far more uatural in form than in the latter, in which they are beautifully rounded at the edges. The Composite beautifully rounded at the edges. The Composite capital is similar to the Corinthian, but the volutes at the angles are bolder and more ornate, springing out of a deep ovolo moulding which runs along the sides of the faces between the spirals. A description of the various forms of capitals used in architecture of different epochs, styles, and countries, will be found in the several articles devoted to this subject. (See ARADIAN, BYZANTINE, EGYPTIAN, HINDOO, GOTHIC ARCHITEC-TUBE, &c.)

CAPITAL, in Mil., a line drawn through any separate part of a system of fortification, such as a bastion, ravelin, lunette, &c., dividing it into two equal and similar parts. Thus the capital of a bastion is the similar parts. Thus the capital of a bastion is the straight line drawn from the salient angle through the

cuttre of the entrance in the rear.

CAPITAL, in Pol. Econ., may be defined as the accumulated savings of industry, capable of being employed either for the support of human existence, or as an instrument of production. In Com. the term is generally understood to mean the accumulated stook of every description with which a merchant or manufacturer, earlies on his business. In this sense it in facturer carries on his business. In this sense it infacturer carries on his business. In this sense it in-cludes not only the actual money employed, but the plant or machinery requisits for the production of commodities, as well as the buildings, raw materials, &c., indispensable for trade purposes. In short, it is wealth appropriated to reproductive labour. In the acience of political economy, capital has, however, a more exact meaning. It is difficult accurately to de-the it, and much valuable time has been wasted in fatile discussions upon the subject; but it will suffice the exact meaning that the machine that it comprehends are to say, in ordinary language, that it comprehends every species of wealth which a nation or community nosspecies of wealth which a nation or community pos-senses as the result of human exertion, and applicable to present and future uses. It represents the entire realth of a country, as apart from individuals. Upon reference to the most important treatises which have appeared upon this branch of political philosophy, we find capital usually divided into two kinds, viz.—1st, Bixed capital, consisting of the tools and instruments

the hands of their respective dealers, and of the money which is necessary for orivulating and distributing their to their final congumers." Fixed and circulating capital are dependent, and reast upon each other accordingto circumstances; and Mr. McCulloch lays it down as a cardinal dectride, that "it is only by their conjoised and powerful operation that wealth can be largely produced and universally diffused." He further says, "The quantity of industry, therefore, not only increases in every country with the furcess of the stock or capital which sets it in motion, but, in consequence of this increase, the division of labour becomes extended, new and more powerful implements and machines are invented, and the same quantity of labour is the hands of their respective dealers, and of the money thus made to produce an infinitely greater quantity of commodities. The ultimate object of the production or employment of capital is to provide for consumers, the wants or desires of whom vary with their condition of

fe." (See POLITICAL ECONOMY.)

CAPITAL ACCOUNT, in the financial affairs of railways and of public companies, signifies all that appertains to the capital stock. In railway concerns, for example, the money obtained for shares and upon debentures is lodged in a bunk, where it constitutes the capital account of the railway company, and serves as the source whence the directors of the company may obtain the means of purchasing the land, locomotives, rails, carriages—in brief, everything necessary to bring the undertaking up to the point of working. Upon the undertaking up to the point of working. Upon the opening of a line of railway for traffic, another account is commenced, called the revenue account, and which is frequently kept in another bank, and kept totally apart from the capital account. (See REVENUE AC-COUNT.)

CAPITAL LETTERS are those large letters of the alphabet that are employed in writing and printing, in place of small letters, at the beginning of proper names, sentences, lines in poetry, &c. Formerly was the custom to begin every noun with a capital letter, and this is still the case in German; but in English the capitals are now more sparingly em-ployed. The principal occasions in which they are used are at the commencement of proper names of persons, places, mountains, &c.; of adjectives derived from proper names; the opening of quotations; beginning of a sentence, and of each line in poetry; the pronoun I; and every principal word in the titles of hooks.

CAPITAL PUNISHMENT, in Crim. Juris., is the punishment of death,—the depriving the criminal of his life. It is so called from the head being that part of the body most commonly acted upon. The modes of in-It is so called from the measurement of in-body most commonly acted upon. The modes of in-flicting capital punishment have been very various at the different countries. Sometimes the object has been merely to accomplish the death of the criminal; at other times, it has been to prolong and add to his sufferings by cruci tortures, to satisfy a craving for vengeance, or as a public example. would be well-nigh impossible to enumerate all the ways which ingenuity has devised for the purpose of adding to or prolonging the sufferings of those who are being put to death; but among the more common may be mentioned, burning at the stake, crucifying, sawing in pieces, quartering alive, breaking upon the wheel, exposing to be torn by wild beasts, pinching to death with red-hot pincers. When the object is marely the with red-hot pincers. When the object is merely she infliction of death, hanging or beheading is usually had recourse to, and these are now almost the only modes employed in Europe. There are several important questions connected with capital punishments much agitated in the present day, which, however, our limits will only admit of our entering upon very briefly. There are many persons, whose opinion is entitled to the greatest weight, who hold that the state has no right to inflict death as a punishment for crime. right which a state possesses to punish for offences arises from the right which every one meturally has to protect himself from injury at the hands of another. In a state of nature, every individual has a right to protect himself from injury, and to repel force by force, and may even take away the life of another. meed by the labourer in creating the products of his minute, every individual has a right to meed by the labourer in creating the products of his protect himself from injury, and to repel force by industry, the machinery he makes and guides, and the protect himself from injury, and to repel force, and may even take away the life of another, if premises inscessary either to applicate his efforts or to necessary, to preserve his own. It was the consciousness of this great natural law that made Cain cry our hadam Smith explains as comprising "the provisions, against the severity of his punishment, saying, that made the consciousness of the provisions, and maintain of all kinds which are in "every one that findeth me shall slay me." When

# Capital Punishment

men come into a state of society, the right of protecting themselves from injury is transferred, by common consent, from individuals to the community, which, in this case, receives eractly the same power over all its members as each individual man naturally had to protect himself from others. This, of necessity, includes the punishment of death; and there is also the Scripruns injunction given by God himself to Noah and his children, that "Whose sheddeth man's blood, by man shall his blood he shod." Hence it is that the state has the right to punish murder by death; and practically In this country it is, happily, only in cases of murder that capital punishments are now inflicted. In Blackstone's time there were no fewer than 160 crimes punishable by death. There is more room to doubt whether capital punishments ought to be inflicted for Matthew Hale, "When offences grow enormous, frequent, and dangerous to a kingdom or state, destructive or highly pernicious to civil societies, and to the great insecurity and danger of the kingdom or its in-habitants, severe punishment, or even death itself, is necessary to be annexed to laws in many cases by the prudence of lawgivers." There are some who, while they do not deny the right of the state to inflict capital punishment, yet question its expediency, asserting that the desired end would be as well, or better attained in another way. The end of punishment is not to avenge past, but to prevent future offences. There are three ways in which this may be accomplished :-- 1. by reforming the criminal himself; 2. by preventing him from scain offending; and 3. by deterring others through his example. It is this last that is the principal object in view in all criminal punishments. Is this object, then, best obtained through capital punishment, or might it be better attained in some other way? Would the continued example of a living culprit, condemned to a lifetime of labour as a slave to repair defined to a metime of innour as a sare to repair the injury done to society, have a greater effect in deterring others from crime than the sight of an ex-ecution? It is here, in our opinion, that the strength of the arguments against capital punishment lies. We believe that it is scarcely possible for those for whose benefit the example is specially intended, for wiose benefit the example is specially intended, in any measure to realize the feelings of one under sentence of death; and we may easily suppose that they will not strive to do so. While, doubtless, the culprit himself would gladly welcome any kind of servitude, however hard, in exchange for certain death, we believe that generally the culcoker would regard that mode of death vastly preferable to a prolonged period of suffering, from which there was no hope of deliverance. Funishments of long duration are much more terrible to the spectator than those that are severe, but soon over. The intenseness those that are severe, but soon over. Another make such an impression upon the mind as its long continuance. Many think that they could meet death with firmness and intrepidity, who would shudder to think of perpetual slavery. The would shudder to think of perpetual slavery. The terrors of death make so slight an impression that it soon passes out of the mind, especially if moved by desire or passion. The tendency, too, of a public execution is (except in rare cases) rather to excite the pity and compassion of the spectators for the sufferer than detestation of his crime; and there have been cases, too, where persons have been of so deprayed tastes, as that the sight of a public execution has even moved them to desire what they regarded as the color of such an exhibition. It has been advanced by Sir Samuel Romily, against those who hold that the state has no power to inflict capital punishment, that if, been advanced as the color of moved them to desire what they regarded as the color ment is, or can be, greater than that of death; but to the spectator, perpetual slavery seems much the severer of the two. The spectator collects all the miserable moments of a slave's life into one point, while to the slave himself they are diffused over a long period; the sufferer, etco, becomes, by habit, callous to his misfortunes, and even finds sources of consolation, of which the onlockers are ignorant. While, therefore, perpetual slavery would serve effectually to prevent the criminal from further offend. long pariod: the sufferer, stoo, becomes, by habit, and children, if there be any with the garrison. The callous to his misfortunes, and even finds sources of besiegers generally take possession of the arms and consolation, of which the onlookers are ignorant, stores remaining in the place. A convention is a sour while, therefore, perpetual slavery would serve efforcapitulation by which the general of an army oscial factually to prevent the criminal from further offend-pying any district agrees to withdraw his troops and

# Capitalstign

ing against the laws, such a proceeding would doubt-less be the more merciful to him, and would also, we believe, serve more effectually as a means of deterring others. It has been well said, that "a penal systems ought to sim at economizing pain by diffusing its largest amount of salutary terror, and thereby deterring as much as possible from crine at the smallest expense of punishment actually inflicted." The criminal would also be, in this way, able to contribute something for the good of society, whose laws he had bricken, and might also have time to prepare himself for that tribunal before which he had yet to appear. There would also be an important gain in the greater certainty of the punishment; for "crimes," says Beocaris, "are more effectually prevented by the extensity than by the serving of cupital punishment," The very everity of capital punishment prevents it in many cases from believe, serve more effectually as a means of deterring than by the severity of punishment." The very severity of capital punishment prevents it in many cases from being carried out, and thus allows some hope of escape, even to the most guilty. The arguments against capital punishments will be found shy stated by Beccaria, "Essay on Crimes and Punishments;" and those on the opposite side by Jeremy Bentham, "Estamate of Punishment." (See Punishment.)

CAPITATION, kā-pit-ai-shum (Lat. caput, the head), denotes a thing that is applicable to all persons—literally, to every head. A capitation or poll-tax is a tax levied on persons by the head, without reference to property or other circumstances: it may be on every

property or other circumstances; it may be on every one; on all males; on all above a certain age, &c. In France the ancient capitation-tax is now replaced by

more approved modes of taxation.

CAPITOLINE GAMES, kd-pit'-o-line, annual games instituted by Camillus, and held by the Romans in honour of Jupiter Capitolinus. They commemorated the preservation of the Capitol from the attacks of the Gauls. The name was also given to certain games which were relebrated every five years. Nerv endeavoured to introduce a new method of computation of time from this quincumprise schaftering leads that the computations.

of time from this quinquennial celebration.

CAPITULAR, kū-pib-u-lar (Lat. caput, the head), is a term frequently employed on the continent to de-

signate a major canon or probendary, a capitular member of a cathedral or collegiate church.

CARITULARIES, kip-it-u-la-ries (Lut. capitularia) were certain laws or ordinances issued by the French kings of the first and second Frankish races, for the administration of civil and ecclesiastical affairs. These capitularies were made in the assemblies of bishops and lords of the kingdom. The best known are those of Charlemagne and Louis. Ansegisus, abbet of Fontenelles, made a collection of these in 827, and other collections were made subsequently. Bishops were also accustomed to give the name of capitularies to the rules which they drew up from the canons of coun-cils for the regulation of their own dioceses.

CAPITULATION, kāp-it-u-lai'-shun (Lat. capitula, heads, from caput), in Mil., the act by which an officer in command of a fortress or body of troops surrenders to the enemy. The terms of the surrender are stated in a series of articles, to which the expression is more particularly applied. The governor of a fortress is justified in capitulating to an enemy when he has defended his post as long as the ammunition, provisions, and resources of the place will permit; for when the walls have been breached, and there is no hope of obtaining relief, continued resistance would be an act of madness and folly, which would sooner or later compel him to surrender at discretion, placing himself and his forces entirely at the mercy of the enemy. A white flag is the sign that the besieged desire to ca-pitulate. The articles are generally drawn up by pitulate. The articles are generally drawn up by officers deputed for the purpose by the general commanding the investing army on the one hand, and the governor of the fortress on the other. The terms generally depend on the nature of the case, but, in most instances, the beleaguered troops are permitted to march out with drums beating and colours flying, and the officers are allowed to retain their private preparty. Protection is obtained for all, and considerate treatment for the sick and wounded, and the women considerate

# Capitulum

evacuate it in favour of a superior force, which he cannot hope to oppose with success in the field.

Captrollum, ki-pit'-u-lum, in Bot., a kind of inflorescence, consisting of a close terminal collection of flowers surrounded by an involuce. It constitutes the compound flower of Linnaus, and is also known under the names anthodium and head. The receptacle bearing the flowers may be flattened, as in the cotton highle, or alightly convex as in the shapenile. thistle; or slightly convex, as in the chamomile; or globular, as in the American button-bush; or of other form hence the numerous modifications of the capitulum. In the nat. ord. Composite the flowers are always arranged in capitula.

arranged in espituis.

\*\*Capproblem or käp\*no-män-se (Gr. kapnos, smoke; mantrie, divination), a species of divination used by the ancients. If the smoke ascending from the sacrifice was thin and light, and went up in a straight line, it was considered to augur favourably; but if went in any other direction, it was an evil omen. Some practised this kind of divination by throwing propriets is sample, seeds on the fire, and watching the

poppy or jasmine seeds on the fire, and watching the direction of the smoke in the same way.

Carnonge, or Karnomor, käp'-no-mor (Gr. kapnos, smoke, and moira, a part), a colourless oil of peculiar odour, resembling that of ginger, discovered by Reichenhach, amongst other products, in heavy oil of tar. It is limpid and volatile, insoluble in water and solution of nates, but dissolving readily in also believed. 'It is limpid and volatile, insoluble in water and solution of potash, but dissolving readily in alcohol, ether, and the essential and fixed oils. Its specific gravity is slightly below that of water. It boils at 345° Fahr, and distils unaltered. It burns with a sooty flame, and is perfectly neutral in its reactions. It is obtained by distilling a solution of crude creosote in potash and with water. With sulphuric acid it forms a purple-red solution. It has not yet been satisfactorily analyzed. Caponnière, &p-on-yaire' (Fr.), in Mil., a pussage made scross the ditch of a fortress to any of the contworks, such as the ravelin in front of the curtain

outworks, such as the ravelin in front of the curtain connecting any two bastions. It is composed of a double line of parapets about eight or nine feet high, with a banquette from which the defenders may fire. Externally, the earth slopes from the top of the parapets to the bottom of the ditch, forming a glacis on either side of the work. When only one parapet is made, it is called a demi-caponnière. Sometimes the expansive takes the form of a covered culture of made, it is called a demi-caponniere. Sometimes the caponnière takes the form of a covered gallery of masoury, with the sides loopholed for musketry. In fleld-works they are formed of palisades, or consist of treaches with a bomb-proof covering.

\*\*Capora\*\*, \*\*k^\*-pote\*\* (Fr.)\*, a long cloak made of muslin or black silk bordered with lace. It is worn by ladies

en negligic. The name is also given to a large horizontal hat with a heavy fringe of lace; and over-conts worn by the French soldiers are called capotes.

CAPPABIS, kap'-pa-ris, in Bot., the Caper-bush, the



CAPER PLANT.

typical gen. of the subord. Capparen, of the nat, ord. Capparidacen.
The pickled flower-buds of various species are used under the name of capers. Those eaten in Europe are the produce of *C. spinosa*, a trailing shrub which grows in rocky places in the south of Europe. It is the only species of the order found on the north of the Mediterranean, The capers used in Barbary are obtained from C. Fon-tanesti, and those used . The latter species is

LARRY FIRST.

Lancait, and those used la Egypt from C. egyptiaca. The latter species is believed to be the hyssop of Scripture.

CLEVANIACIE, http://doi.org/10.10000/10.10000/10.10000/10.10000/10.10000/10.10000/10.10000/10.10000/10.10000/10.100000/10.10000/10.100000/10.10000/10.100000/

Caproic Acid

rous, placed on a hemispherical or an elongated disk : the ovary 1-celled, the style thread-like or wanting; the fruit is either pod-like and dehiscent, or bacate and indehiscent. The two kinds of fruit have led to a the fruit is either pourme and demonstration to be and indehiscent. The two kinds of fruit have led to a division of theorder into two sub-orders; vis., Closuser, characterized by a capsular fruit, and Capparese, by a baceate fruit or berry. In their properties the Capparedacea greatly resemble the Crucifera, being generally pungent, stimulant, and autiscorbutic. Some are aperient, diurctic, and authelmintic.

are aperient, dureric, and sattachments.

CAPRA, the Goat. (See GOAT.)

CAPRIC ACID, kip'-rik (Lat. capra, a gost, terminal icus), a volatile fatty acid discovered by Chevreni amongst the products of the suponification of butter.

It is also procured by acting on oleic acid or oil of rue with write acid. It is also procured by acting on oleic acid or oil of rue with write acid. with nitric seid. It is also found in small quantities in the fatty acids of cocos-nut oil. Capric acid crystallizes in fine needles, which fuse at 86°, giving out an odour resembling that of a goat. It is sparingly soluble in boiling water, from which it separates in glistening It has been named capric seid from its peculiur odour, but is now generally termed ratic acid, from being easily contounded with caproic and caprylic acids, and from being the acid of which oil of rue is the aldehyd. (See ALDRHYDE.) CATRICCIO, kā-prit'-tcho (Ital.), in Mus., an irregular

species of composition, in which the composer, without any other restraint than the boundary of his imagination, continually digresses from his subject and runs wild amidst the ferrour of his fancy. Perhaps the finest specimen of this form of musical composition is Mendelssohn's B minor C. for orchestra and pianoforte.

CAPRICORNUS, kap-re-kor'-nus (Lat. capricornus, & goat), a constellation in the southern hemisphere, from which the tenth sign of the zodiac, between 270° and



CAPRICORNUS.

300° of longitude from the first point of Aries, originally derived its name. The sun enters the winter solstice in this sien.

CAPRIFOLIACE E. kap-ri-fo-li-ai'-se-e (Lat. caper. goat: folium, leaf, in reference to the climbing habit of the plant), in Bot., the Honeysuckle fam., a nat. ord. of dicotyledonous plants in the sub-class Corolliflors, consisting of shrubs with the following general characters: -- Leaves opposite and exstipulate; calyx superior, 4-5-cleft, usually bracteated; corolla monopetation, 4-5-cleft, tubular or rotate, regular or irregular, rarely polypetalous; stamens 4-5, inserted on the corolla, and alternate with its lobes; overy inferior, 1-5-celled, usually 3-celled, often with I orule in one cell and several in each of the others; fruit generally a berry, dry or succellent, indehiscent. There are 18 genera and about 220 species, chiefly natives of the northern parts of Europe, Asia, and America. They often have showy flowers, which are commonly sweetscented. Many are cultivated in our gardens and shrubberies; as Honeysuckles, which are species of the genera Caprifolium and Lonicera; Guelder-roses, specess of viburnum; the Laurustinus (Viburnum Thus); the Snowberry (Symphoricarpus racemosus); and the common Elder (Sambucus nigra). Some of the plants are emetics and mild purgetives; others are astringent;

others sudorific and diuretic; and a few are aerid.

CAPROIC Acts, kip-ro'-ik (O<sub>2</sub>H<sub>1</sub>,O<sub>4</sub>), an acid obtained during the saponification of butter or coocs-nut oil, or by oxidizing cleic acid by nittle arid. It is

# Caproie Alcohol

Equid at ordinary temperatures, has a sweet and pungent taste, and a characteristic odour of acid perspiration. It boils at 335° Fahr., and its specific gravity is '830. It is best prepared by boiling cyanide of amyl with alcoholic solution of potagh. Ammonia escapes, and a crystalline residue of caproate of potagh is left behind. The salt is dissolved in water, and sulphuric soid is added, which unites with the potash, leaving the caproic acid floating on the surface. Caproic acid forms monobasic salts with the

CAPBOIC ALCOHOL.—Caproic alcohol is the hydrated exide of caproyl or hexyl, the sixth in the series of the homologous radicles. It is often called hexylic alhomologous radicles. It is often called herylic al-cohol, It is obtained from the fermented mark of the cohol. It is obtained from the fermented mark of the grape, along with propylic, butylic, and amylic alsohols, from which it is separated by fractional distillation. It is a colourless aromatic liquid of specific gravity 832, and it boils at 302 Fahr. By heating it with hydrate of potash, caproate of potash is formed, in the same manner that acetate of potash is formed from vinic alcohol when it is heated with hydrate of potash, acctic acid bearing the same relation to vinic alcohol that caproic acid does to caproic alcohol,

CAPROLC ETHER .- Caproic ether is the caproate of ethyl, and must not be confounded with caproylic other, which would be oxide of caproyl—a substance as yet unknown. It is prepared by distilling caproute of baryta, sleebol, and sulphuric acid together. It is a limpid, oily fluid, boiling at 324° Fahr., and possessing an agreeable fruity odour, resembling that of pine-

apple.

CAPROYL, or HEXYL, kip'-roil, hex'-ile (C12H18).—
The radicle of caproic alcohol is termed hexyl, from being the sixth of the homologous radicles forming the alcoholic series. It is obtained by the electrolysis of conunthylate of potash as a fragrant oil, hoiling at 397° Fahr. It is a permanent substance, and remains undecomposed when submitted to the action of sulphuric or moderately strong nitric acid; but by mixing the two it is changed into a fatty acid, supposed to be caproic acid.

CAPRYL, or OCTYL,  $k\ddot{a}p'$ -rile ( $C_{10}\Pi_{17}$ ), the eighth radicle of the homologous alcoholic series, obtained by treating the chloride of capryl with metallic sodium. Its properties have not yet been thoroughly investi-

gated.

gated.

CAPRYLIC ACID. kdp-ril/-ik (C<sub>16</sub>H<sub>16</sub>O<sub>4</sub>), one of the volatile acids obtained by Chevreul during the saponification of butter. It is also obtained by the action of nitric or oleic acid. It is a colourless, cily liquid, insoluble in water, but soluble in alcohol and ether, with a disagreeable sudoriferous smell. It becomes solid at 50° Fahr., and boils at 457° Fahr. It is prepared by decomposing caprylate of baryta with sulphuric acid. It forms monobasic salts with the bases, which have not as yet been expanded.

which have not as yet been examined.

CAPRYLIC ALCOHOL.-Caprylic or octylic alcohol is the hydrated exide of capryl or octyl, as vinic alcohol is the hydrated exide of capryl or octyl, as vinic alcohol is the hydrated exide of ethyl. It occurs in small quantities in the fermented mark of the grape; but its most available source is eastor oil, which contains a compound of glycerin and ricinolic acid. This com-pound, when heated with hydrate of potash, is resolved pound, when heated with hydrate of potash, is resolved into hydrogen, sebate of potash, and octylic alcohol. The following is the process for its preparation, recommended in Miller's "Elements of Chemistry," vol. iii. p. 129:—"Castor-oil is saponified by means of potash or sods, and afterwards an excess of the hydrated alkali is added, amounting to one-half the oil used. The mass is heated in a retort, and an oily liquid covered with water distils over. This oily liquid, which is the octylic alcohol, is rectified several times with potash, until the residue is no longer coloured brown. Octylio alcohol is a colourless liquid of a powerful aromatic adour. It is insoluble in water, but dissolves readily in acetic acid, other, and alcohol. Its spec. grav. is '823, and it boils at 356°.

\*823, and it boils at 356."

\*Capertico Erner.—Caprytate of ethyl is generally called by this name; but by doing so it is apt to be confused with true caprylic ether, which would be oxide of capryl. Caprytate of ethyl is a colourless liquid, with an agreeable odour of pineapples. Caprylic add forms ethers with methyl and amyl, which have been investigated by Walls and others.

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Caps, Percussion

Care, Pracussion, kaps, per-kus'-shus (Lat. percenters, to strike), small cylindrical cases of copper, some taining a little detonating mixture at the bottom of the cavity. These cases fit closely over the nipple of the fowling-piece or rifle, and explode when struck sharply by the descending hammer, igniting the powder with which the piece is charged. The detonating composition used in the struck struck is the struck of the struck tion used in the manufacture of percussion caps consists of a mixture of fulminating mercury, chlorate of DETONATING POWDER, FULMINATING MERCURY.)
The following is the method used in making the caps for the use of the British army; the process is similar for all kinds of caps, but for fowling-pieces the copper case is thinner and smaller in size than those made for government, which also have a projecting rim round the edge of the cap, by means of which they are more easily taken from the cap-pocket, and adjusted on the nipple of the rifle. The common cap is destitute of this rim. The copper is prepared in sheets two feet long, and a little more than three inches in width, which are pressed and completely flattened between which are pressed and completely flattened between rollers. By means of steel punches in the form of a cross, measuring three-fourths of an inch between the extremities of opposite arms, the copper is cut-into little pieces of this shape, which are heated for a considerable time in metal cylinders, and then thrown into cold water to harden. They are then plunged into a bath of sulphuric acid and water, which removes the oxide with which the pieces have become coated during the last-named since of the process; and after this the last-named stage of the process; and after this they are dried and oiled. The next step consists in moulding the copper crosses into caps by means of dies, after which the oil is removed by shaking them in sawdust, and the caps are arranged in a perforated plate containing 1,000 holes, in order to be charged with the detonating mixture. This preparation is pressed into the bottom of each cap by the action of another plate studded with projections that fit into each cap as it lies in the perforated plate stready mentioned. Another similar plate, with the projections meared with varnish, is then pressed into the caps. The varnish forms a coating over the fulminating composition to protect it from damp and the action of the weather. After the varnish has been introduced, it is hardened by submitting the caps to the action of a steam-bath, and glazed by the introduction into each cap of a polished nipple, which revolves by the action of a lathe. The caps when finished are packed in small cases, each containing twenty-five. army a cases, each containing wenty-tive. It this army a case is allowed to every twenty rounds of blank or ball cartridge, to cover loss arising from caps missing fire, or other causes. For private use they are packed in boxes containing from 500 to 1,000 each, and numbered to correspond with the nipple for which each cap is the standard of the captain in this district. size is suited. The invention of percussion caps was brought about by an attempt made by the French in 1793 to substitute a fulminating powder for gunpowder, in consequence of the difficulty that existed in Franco at that time of procuring sattpetre. The Rev. Mr. Forsyth, a Scotch clergyman, conceived from this the idea of igniting the charge of powder by means of a detonating mixture exploding by percussion, and in 1807 he patented his process, having laid his plans before the Board of Ordnance, and received encouragement to proceed in the development of his inventi The great difficulty to be overcome was that of insuring the explosion of the detonating powder, which was eventually effected by placing the mixture in a cap or cell of metal. Before 1825 the use of copper caps and the percussion lock had become general, and the old musket with the flint look, which had rendered such efficient service in the Peninsular and other wars, was officient service in the Peninsular and other wars, was superseded by a more efficient arm,—the percussion musket, or Brown Bess, which gave way to the Enfeld, which, in its turn, has been superseded by the Snider rifle, and even improvements on the Snider rifle, The principle of the percussion lock is now applied to heavy ordnance, and many kinds of shells have been prepared to explode by detonation on striking any object, instead of by means of the fuse; among which, that which was invented by Capitain Norton may be especially mentioned. One of the exhibitors of percussion-caps at the Great Exhibition of 1851 made the very ingenious calculation that the

## Capsicine

total manufacture of persuasion-caps for sporting-guns in Europe may be estimated at 1,300 million yearly, requiring 396,000 lb. of copper. (See SHELL.)

CAPSCINE, hap're-sene (from copsicum, derived from Gr. kapte, I bite, in allusion to its pungency), an alkaloid found in the capsules of the various species of captioum used in the manufacture of cayenne pepper. It has a burning taste; is insoluble in water and ether, but soluble in nicohol, and may, when quite pure, be orystallized. It forms salts with nitrie, sulphurie, and acede acids. Its composition is unknown.

Carricum, kap'-se-kum (Lat., a bridle), in Surg., is a single split cloth bandage, used to support the lower jaw; so called from its resemblance to a bridle.

CAPSECUM (from Gr. kapto, I bite), in Bot., a gen. of plants belonging to the nat. ord. Solunaceæ, consisting of numerous species, all remarkable for the



CAPSICUM PLANT.

presence of an acrid resin Capsicine in their called fruits, which are hot, pungent, and stimusous. Though now extensively cultivated in many parts of the Old World, the various species are supposed to be na-tives of South America. The officinal capsicum, the C. annuum of Linnaus, or the C. fastigiatum of Blume, has oblong-cylindrical fruits, not an inch long in the most valuable varieties, but two three inches long in others. commonly sold as Chillies, and are used to make a hot pickle, and the liquid known

as Chili vinegar. Cayenne pepper consists of the powdered fruits of several species of Capsicum, found in the West Indies and South America. In medicine, the fruit of the capsicum is used as a counter-irritant: with salt as a stimulant in scarletina; as a gargle in relaxed sore-throat; and in the form of Cayenne fozenges.

CAPSTAN, käp'-stän (Fr. cabestan), a strong column of timber, shaped like a truncated cone, passing through the deck of a ship, and turned by levers or bars, which pass through holes pierced in its upper extremity, serving, by means of a cable which winds round the barrel, to weigh the anchor and draw up weights, &c. Men-of-war have commonly two capstans, the largest of which, called the main capstan, is placed behind the main-mast, standing upon the first deck, and reaching four or five feet above the second: this is also called the double capstan, because it has two drumheads, and serves two decks for drawing up anchors, and because its force may be creatly accelerated by applying hands on each deck. The other is the jeer, or title capetan: this stands on the second deck, between the main and mizen musts. There is also a flying capitan, so called from its being movable to any part of a ship.

CAPSULE, kap-sule (Lat. capsu, a chest), is a membranous production, inclosing any part like a bag; as the capsular ligaments inclosing the synovia of the joints, the capsule of the crystalline lens of the eye

CARSULE, in Bot., a superior, one or more-ceiled, many-seeded, dry, dehiscent fruit. It is syncarpous, that is, formed of several carpels united together. The dehiscence or opening of the capsule may either take place by valves, as in the forglove, primrose, and rhododendron, or by pores near the summit, as in the poppy and snapdragon. The distinctive name of Pyxis or Pyxidium has been given to a beautiful kind of capade, which opens as if out around near the summit, and presents the appearance of a cup with a lid. Examples of the latter may be seen in the pimpernel and henbane. The capsule is one-celled in the mignonette, heart scase, and gentian; two or more celled in the scrophularia, colchicum, iris, and datura. It is a very common form of fruit, and is found almost universally in some natural orders; such as Papaverusea, Caryo-phyllacea, Primulacea, Scrophalariucea, Liliucea, Iri-dacea, and Gentianacea.

## Captive

a company of infantry, a troop of savalry, or a battery of artillery.—In Mar., it is given to the naval officer that commandes a ship of war. Commanders in the navy are called captains by countery; but the term properly belongs to officers occupying the intermediate rank between commanders and admirals, who ware formerly called post-captains. The name is improperly given to the chief officer of a merchantman, whose propers mapply their is that of market. proper appellation is that of master. Many suitors on board ship holding some petty place of authority among others, are called captains; as the captain of the gun, captain of the forecastle, &c. In the army, the captain has the complete control of the internal economy of his company in matters of discipline. clothing, arms, accourtements, barracks, billeting, and accounts. In this he is assisted by his subattering, —the licutement and ensign in infantry, licutement and cornet in cavalry, and first and second licutements in engineers, artillery, and marines. In the artillery there is an officer called the second captain, formerly termed the captain-lieutenant. The captain is responsible to the major for the good order of his company in every respect. The captains in both services share the advantages derived from a general brevet. The value and method of purchase of a captain's commission, and rate of pay, will be found clsewhere. (See COMMISSIONS, NAVY.) It is necessary that an officer should have been an effective subalters for two years before he can attain the rank of captain. The naval captain holds a post of greater importance than a captain in the army, as it involves a far greater amount of responsibility; the latter being responsible for his company only, while the former is answerable for the safety of his ship and the discipline of the crew, and has the management of everything on board. The captain in the army ranks with a lieutenant in the navy, and a captain in the navy ranks with a lieutenantcolonel in the army until he has held his commission three years, when he ranks with a full colonel. several ships compose a fleet under the command of an admiral, the captain of the ship in which the admiral hoists his fing is called the flag-captain, and takes pre-cedence of others in the fleet of the same rank. The ceptain of the flect is an officer through whom the admiral issues his orders, holding a position similar to that of the principal side-de-camp to a general officer or chief of the staff.

CAPTION,  $k\ddot{a}p'$ -shun (I at. coptio, a taking).—When any commission at law or in equity is executed, the commissioners subscribe their names to a certificate, testifying when and where the commission was executed; and to is a called a caption; also where a man is arrested, the act of taking him is called a caption. There is also the caption of an indictment, which is the setting forth of the style of the court before which the jurors make their presentation. It is also the memo-randum at the foot of an affidavit or statutory declaration, subscribed by the judge, commissioner, or other person before whom it is made, showing the time and place at which it is made.

CAPTION, in Scots law, is a writ issued under her majesty's signet, and in her majesty's name, at the instauce of a creditor in a civil debt, for the apprehension and imprisonment of the person of a debtor until he pay the debt. By a legal fiction, no person in Scotland could be imprisoned for a debt purely civil, unless in royal boroughs or under small-debt decrees; and hence the imprisonment was nominally for the act of rebellion in delaying obedience to the command of the sovereign to pay the debt, and hence, too, it was only granted after a charge of horning. This form of proceeding is now rather matter of history than of custom, baving fallen into desuctude since 1838, the power of imprisonment having been then extended to sheriffs by 1 & 2 Vict. c. 114. Caption is also the name of a same mary warrant of imprisonment issued against an ag to return the papers of a process or lawsuit, which have been borrowed by him and are unduly detained.

CAPTIVE, kap'-tiv (Lat. captives; Fr. captiv), a person taken by an enemy in war. Formerly, captives in war became the slaves of those who took them, or were sold as slaves. Often they were subjected to the greatest oruelties, or were put to death in many inhuman ways. Great numbers of them were sometimes offered as CAPTAIN, kapt's (Lat. caput, the head; Fr. captions), the title given, in Mil., to an officer commanding specifices to the gods of the victors. It seems to have

been a custom occasionally resorted to in the East, to make the captives lie down on the ground and then to put to death a certain portion of them, which was measured by a line or determined by lot. It was in accordance with this custom that Dagid, as we are told, "amote Mosb, and measured them with a line, wind, "emore Mosh, and measured them with a line, casting them down to the ground; even with two lines measured he to put to death, and with one full line to keep alive" (2 Sum. viii. 2). Sometimes, as referred to by Virgil (Eneid, b. viii. 485 et seq.), the living and the dead were coupled together, face to face and hand to land, till the living became as the dead. Somewhat have a with the Romera their needs were coupled. to hand, till the living became as the dead. Some-times, as with the Romans, their necks were exposed to the soldiers to be trampled upon; sometimes they were loaded with irons, and sometimes, as in the case of Samson, their eyes were put out. They were often of Samson, their eyes were put out. They were often stripped naked, and made to travel in that condition, exposed to the hurning heat of the sun by day and to the chilling cold by night. There are frequent references in the Old Testament to the modes of treating captives, and a knowledge of these serves to throw light apon many passages of Scripture prophecy; as when Isaiah describes the character and work of the promised Messiah:—"He hath sent me to heal the broken-hearted, to preach deliverance to the captives, and recovering of sight to the blind, to set at liberty them that are bruised.

CANTIVITY, kap-tiv'-e-te (Lat. captivitas; Fr. oc twite), a term employed in Scripture to denote the punishment indicted by God on the Jews for their dolatry and wickedness, by allowing them to be re-moved out of their own land. This was one of the means frequently adopted by eastern monarchs in order to establish their power over vanquished nations; viz., to transport an important part of the popula viz., to trunsport an important part of the population of those nations into their own dominions; and sometimes, also, they established in the vacated territory a portion of their own subjects. To a people like the Hebrews, whose religion was connected with particular places, such a proceeding must have been particularly severe. When personally removed from Jerusalem, they could no longer obey their sacred law in many of its most vital points, and many others they were forced to modify by reason of their changed circumstances. Their first captivity was that of Egypt, from which they were rescued by Moses; but this is to be regarded rather as a providential dispensation than as a penal evil. We read of six captivities that took place during the government of the judges; but the two most signal captivities of this people were those of Israel and Judah after they had been formed into separate kingdoms, and are known as those of Assyria and Babylon. That which is called the first captivity was not brought about by a single removal of the pop-ulation; on the centrary, the kingdom of Irruel was invaded on several occasions by the kings of Assyria. About B.c. 740, Tiglath-Pileser carried off the more distant trans-Jordanic tribes to Assyria. His suc-cessor, Shalmanezer, twice invaded the kingdom which remained to Hosea. He attacked and reduced Samaria after a siege of three years, B.c. 721, and carried off into Assyria and Media the king and the remainder of the ten tribes, and their place was supplied by colonies from Bubylon and Susis. This was the end of Israel as a kingdom. More than a century elapsed before the second or Babylonish captivity, which overtook the kingdom of Judah. Two distinct deportations are mentioned in the second book of Kings, three in Jeremiah, and one in Daniel. The two principal deporta-tions, however, were—1. That which took place B.c. 598, tions, however, were—1. That which took place n.c. 598, when Jehoiachin, with all the nobles, soldiers, and artificers, were carried away; and, 2. that which followed the destruction of the temple and the capture of Zedekish, n.c. 598. The seventy years of captivity predicted by Jeremiah are dated by Prideaux from n.e. 606. The Jewa in their captivity were not treated as slaves, but as colonists. They had elders and judges among themselves, who governed them and determined among themselves, in governor the among themselves, in disputes according to their own laws. There was nothing to hinder a Jew from rising to the highest eminence in the state, or holding the most confidential offices. The Babylonish captivity was brought to a

a subject which has given rise to much discuss Many attempts have been made to discover them his as a distinct community in some distant part of the interior of Asia. The most probable opinion, however, seems to be that the great mass of them became i seems to be that the great mass of them become as-sorbed in the nations among whom they were plantled; but that many of them returned with the children of Judah, after the Babylonish captivity, to their own land, by which means they became one people, the event probably referred to by Ezekiel when he says, "Thus saith the Lord: Behold I will take the children of I read from arong the heather whither they ha of Israel from among the heathen whither they begone, and will guther them on every side, and bring them into their own land; and I will make them one ation in the land upon the mountains of Israel."

Even of the children of Judah, it is calculated that the gr at majority of them chose to continue in Assyria, and those of them who kept up their national distinctio s were known as the "Dispersion," or the "Dispersed among the Gentiles." The character, language, and habits of those that returned, of the Jewish people, were very markedly changed by the captivity. Their love for agricultural pursuits had declined, and a taste for commercial enterprise had taken its place. A new and eeper feeling of reverence for the letter of the law o. Moses had taken possession of them, and a profound hatred of their old sin of idolatry. The sufferings entail d upon the Jewish people under the Romans far exceeded that of any other captivity which they underwent; for they were then reduced to a real state of hondure. According to Learning 1100 000 see of bondage. According to Josephus, 1,100,000 men fell in the siege of Jerusalem by Titus, and 97,000 were captured during the war. Of the latter, many were cast to wild beasts or butchered in the amphitheatres; others were doomed to work as public slaves in Egypt, and only those under 17 years of age were sold into private bondage. An equally dreadful destruction fell upon the remains of the nation, which had once more assembled in Judga, under the reign of Hadrian (A.D. 133), as related by Dion Casaius. By these two savage wars the Jewish population must have been effectually extirpated from the Holy Land itself, a result which did not follow from the Babylonian captivity. Since that time, the Jews have been, with few and partial exceptions, a despised, oppressed, and a degraded people, scattered among the nations of the earth.—Ref. Calmet's, Smith's, and Kitto's Dictionaries of the Bibic.

CAPTURE, kap'-tsher, the act of taking or seizing; as the capture of a vessel, of booty, of an enemy by strategem, surprise, or force. (See Boory, Prize.)

CAPUCHINS, kip-u-sheens', a branch of the religious order of the Franciscans, so called from the capue,

order of the Franciscans, so caned from the capuco, a sharp-pointed cap or covil wherewith they cover their heads, having in addition the ordinary franciscan babit. They owe their origin to Matthew de Bassi, a Franciscan monk of Urbino, who, baying resolved upon a more literal fulfilment of the rule of St. Francis than then prevailed, obtained in 1526 from Pope Clement VII. leave to wear this cap, and to presch anywhere. His example was soon followed by others, and convents of them were established in various parts. They soon spread over Italy, and in 1573 were established in France, and in 1606 in Spain. They followed the Spaniards and Portuguese across the ocean, and the Spannica and I original and the engaged in missionary work in America, Asia, and Africa. The abolition of the monastic system in Germany and France at the close of the last century almost wholly annihilated the Capuchina, and they are fered severely in Spain during the 3rd and 4th decades of this century. At present they are on the increase in all Catholic countries. The Capuchins are enjoined to dress in coarse and mean garments, to go barefooted, and to journey neither on horseback nor in vehicles; to practise the strictest abstinence (though the use of meat and wine is not forbidden); to beg neither mest, nor eggs, nor cheese, but to accept them when offered; to ask for no more than suffices for the day; to gather provisions only for three, or at the most for seven days; to touch no money; to admit as novices persons neither too young nor too weak; to refuse pay for mass; to offices. The Babylonish captivity was brought to a close by the decree of Cyrus, B.C. 536, and the return of a portion of the nation, under Sheshbazzar or Zermortification of the senses and the unter neglect both rabbabel, B.C. 535. What became of the ten tribes is of soul and body which characterized the Capuchius pray in ellence two hours each day; and to observe the ancient strictness in divine worship. The grossest mortification of the senses and the unter neglect both

# Capudan Pasha

gave them great influence over the hearts of the people.

Ref. Herzog's Theological Dictionary.

Capunan Passa, kap'sa-din pa-sha' (Turkish), is the officer who has command of the fleet and the management of all naval affairs in the Ottoman empire. He has also civil jurisdiction over a number of scaports and maritime districts, as well as the Turkish islands of the Archipelago. He is a pasha of three tails, and a member of the divan.

CAPUT, kail put (Lat., the head), in Anat., is applied to that portion of the human body which comprises the skull and face. The skull is distinguished into the following parts:-the vertex, or crown; the sinciput, or fore part of the skull; the occiput, or hind part; the fempora, or temples. The parts of the facies, or face, are the forehead, eyes, nose, &c. (See Face.) The term caput is also applied to,—1. the upper extremity of a long bone, as the humerus; 2. the origin of a muscle; 3. a protuberance resembling a head, as the caput Gallinaginis, a small eminence in the urethra; 4. the beginning of a part; as caput coli, the head of the colon

CAPUT BARONIAL (Lat., the head of the barony), was formerly used to denote the chief seat or castle of a nobleman, where he had his usual residence and held his court.

CAPUT LUPINUM (Lat., wolf's-head), a term formerly applied to an outlawed felon, to denote that any one might slay him that should find him,—that he might be

knocked on the head like a wolf.

CAPUR MORRUUM (Lat., dead head), a term employed by the old chemists to denote the fixed residue of chemical operations after all the volatile matters had been driven off.

CAPUT OBSTIFRUM (Lat., stiff-head), in Med., de-notes wry-neck, an involuntary and fixed inclination of the head towards one of the shoulders.

CAPUT PURGANS (Lat. caput, and purgo, I purge), a name given to a medicine which causes a defluxion from the nose, purging, as it were, the head.

CAPUTIATI, kā-pu-ti-ai-te, in Eccl. Hist., a sect of

religious fanatics which arose in the latter part of the 12th century, in the diocese of Auxerre, and thence a singular kind of cap (capuche), which they wore; whence their name. Their leader, Durand, pretended to be inspired by the Virgin Mary, and declared that their object was to restore peace and liberty upon sarth, by levelling all distinctions, abolishing subordination, and abrogating the magistracy. Hugo, bishop of Auxerre, waged war against them, and succeeded in

putting them down.

CAPPBARA (Hydrochæerus capybara), käp-i'-bă-ră.— This rodent animal is found in the south of America. and in general appearance greatly resembles a small pig. It feeds on vegetables and fish; for which latter purpose it frequents rivers, and swims about in pursuit of its prey with great facility. "They occasionally frequent the islands in the mouth of the Plata, where the water is quite salt, but are far more abundant on the borders of fresh-water lakes and rivers. In the daytime they either lie among the aquatic plants, the daytime they either he among the aquatic plants, or openly feed on the turf-plain. . . . Both the front and side view of their head has quite a ludicrous aspect, from the great depth of their jaw. The animals I saw at Maldonado were very tame: by cautiously walking, I approached within three yards of four old ones. As I approached nearer and nearer, they frequently model their possile which is a lowquently made their peculiar noise, which is a low, sharp grunt, not having much actual sound, but rather arising from the sudden expulsion of air. The only acise I know at all like it is the first hoarse back of a large dog. Having watched the four from almost within wrm's length (and they me) for several minutes, they rushed into the water at full gallop with the greatest impetaceity, and emitted at the same time their bark. After diving a short distance, they came again to the surface, but only just showed the upper part of their heads. When the female is swimming in the when the semale is awimming in the back."—(Darwin.) The flesh of the capybara is esteemed a dainty by the jaguar, which preys largely upon this snimal. The way in which it captures the capybara is very singular. It is said that, leaping to the back of the doomed animal, the jaguar, by a rapid

#### Caraites

movement of the fore-paws, twists its head round, and breaks its neck.

CAR, or CHAR, kar, occurs frequently in the names of places, and teems to be the same as the Celtic caer, which signifies a city.

CARABIDE, kā-rāb'-i-de (Gr. karabos, a beetle), a family of coleopterous insects, comprising several species. The principal characteristics are given as follows:—Anterior tibin without emargination on the inner side; head narrower than the throat; eyes rather prominent; palpi with the terminal joints often compressed, large, and somewhat triangular in shape; mandible simple, moderately long, and rather thick. In general, the members of this family prey upon innently adapted for this purpose, being very firmly encased in a stout covering, enabling them to esarch among the stones, crawing over and under them for their prey without fear of hurt; at the same time they can suffer but little from the attacks of other insects. Some species of the Carabidæ are, it has been ascertained, berbivorous, finding their food principally in the cornfields. In the British Museum may be found a splendid collection of these insects.

CARBINE, or CARBINE. (See CARBINE.)
CARBINERS, kūr-ā-bin-eers' (Fr.), a name formerly
applied to light cavalry employed in the French service. and among the Spaniards, Italians, and Arabs, for skirmishing and outpost duty. Many regiments of English cavalry were once known by this title, but it is now the distinctive appellation of the 6th dragoon

guards.

CARACAL, kā-rā-kāl! (Felis Unracut), some alled the Persian lynx, is found in both the conticalled the nents of Asia and Africa. This animal is the lynx of the ancients. It is about three feet in length, of a pale reddish-brown above, and whitish beneath. It has a small head, although somewhat clongated, and small smin real, annuigh somewhat conflated, and shad ears. In disposition it is fierce and savage, which, combined with great strength, renders it no mean animal. Such qualities, which would, in its wild state, make it rather an inconvenient and troublesome animal to the natives, are turned to good account by employ-ing its services in the chase of other animals and birds, in which pursuits it is said to acquit itself in a highly creditable manner.

CARACARA. (See FALCON.)

Caracole, kar'-a-kol (Fr., a wheeling about), a term applied, in the art of Horsemanship, to the half-turn or semi-round taken by the rider either to the left or right. In the arm, after each discharge, the cavalry make a caracele, in order to pass to the year of the squadron.

CARAITES, kä'-rui-ites, one of the most ancient and most remarkable of the Jewish sects. They kept aloof from the other Jews, and dwelt chiefly in S.-W. Russia, Galicia, Turkey, and Persia. The rabbins make them identical with the Sadducees of the New Testament, or a branch of that sect which separated themselves from the other Jews under the leadership of one Anan, about A.D. 640. The Caraites themselves, however, claim a much higher antiquity, and produce a catalogue of doctors up to the time of Ezra. They are not mentioned by either Josephus or Philo; and hence it seems probable that they were not in existence in the times of these authors. The most likely hypothesis is, that they separated themselves from the Rabbinists about the time of Anan, maintaining the authority of the Word of God, and rejecting the traditions of the elders: hence they received the name of Carain, testualists, nence they received the name of Cardim, textualists, or persons holding by the text of Scripture. They do not, however, reject all tradition, for they have certain interpretations which they call hereditary, and in which they confide. But they give no oredit to the explanations of the Cabbalists, nor to any institutions of the Talmud but such as are conformable to Scripture. Their theology differs from that of the other Jews, chiefly in being purer and more free from supersition. The written Word of God they regard as the only certain rule of faith and practice, and vindicate the right of private judgment in its interpretation. They have many excellent customs, and insist much upon practical piety. They direct their attention chiefly to the law of the Old Testament, to the almost entire neglect of the prophecies; and thus they never

# Carambole

attain to the true spirit of the revelation. They believe In the immortality of the soul; in the resurrection, judgment, heaven and hell, and the other doctrines which the ancient Sadduce's denied. They are simple which the ancient Sadduce's devied. They are simple in their dress and manners; conscientious, peaceful, honest, and true to their word. They mingle but little with other people; but those among whom they live speak very favourably of them. Mr. Oliphant says that "the Caraite merchant enjoys everywhere so high a reputation that throughout the Crimea his word is considered equal to his bond." The number of this sect has been greatly diminished, partly by wars and sect has been greatly diminished, partly by wars and other public calamities, which have befallen the countries in which they were settled. There are at present about 500 in Vilna, 150 in Galicia, 200 in Odessa, and 4,000 in the Crimes. They have also a congregation in Constantinople, one in Jerusalem, one in Alexandria,

and several in Asia Minor and Persia.

CARAMBOLE. (See Avershoot.)
CARAMBLI, ka't-ra-mel (Fr.).—If sugar is melted, and
the heat raised 400° or 420°, the sugar loses two equivalents of water, and becomes a brown, deliquescent,
and nearly tasteless mass. Caramel is often used by cooks and confectioners as a brown colouring matter. The brown colour in brandy and rum is due to a small portion of caramel dissolved in them.

CARAPA, kă-rai-pă (from caraipe, its African name), in Bot., a gen. of tropical plants belonging to the nat. ord. Meliaceæ. C. guineensis, an African species, yields a fatty oil called Kundah or Tallicoonali, which is purgative and anthelmintic. Besides being valuable in medicine, it is well adapted for burning in lamps. It is expressed from the seeds. The bark of the tree has febrifugal properties. C. guianensis, a native of Guiana and the adjacent countries, furnishes similar products; indeed, it is somewhat doubtful whether the species are essentially distinct.

CARAT, or KARAT, kar-at'.—The carat was originally a French weight, and was equal to the twenty-fourth part of a mare or half-pound. It was used for weighpart of a mar or man-penda. Twas used for weight ing gold and jewels, and its weight varied greatly in different countries. In time it fell entirely into disuse, and at the present day the caraft merely signifies the twenty-fourth part of the weight of any piece of gold, or alloy of gold. Thus, if the piece weighted is all gold. it is said to be twenty-four carat gold : if only half of it is gold, it is said to be twelve carat gold; and so on. In the weighing of diamonds the carat is used, and is then equal to 31 grains. The original French carat varied from one ounce to one-third of an ounce.

CABAVAN, kar'-a-van (Persian karwan, a trader), is a name given to a company of merchants, travellers, or pilgrims, who associate together for safety and con-venience, and at stated times traverse the deserts or other dangerous parts of Asia or Africa. In this way commercial intercourse between different countries has been chiefly carried on in these parts from the remotest antiquity. Since the establishment of the Mohammedan religion, travelling has been rendered more common and necessary, a visit to Mecca being enjoined by the Prophet upon all his followers at least once in their lives. Large numbers of the faithful, therefore, assemble in every country where the Mohamucdan faith is established, and proceed in caravans to Mecca. The greater number of those proceeding to that city, however, have trade as well as prayers in view. These caravans are regularly organized by government, and are under the direction of chiefs or agas, who have regardly under them such a suppose of themse access are under the direction of enters of again, and usually under them such a number of troops as is deemed necessary for their protection. The different travellers have their proper place assigned to them in the long line of march, those from the same town or province being usually together. A caravan has some-times several thousand camels, which follow each other in single file, so that it may be several miles in length. Camels are almost uniformly used in preference to the horse or any other saimal, on account of their great patience of fatigue, and their wonderful adaptation for travelling in the desert. The usual arrangement is to

# Carbazotic Acid

Cairo. The former of these is the largest and best regulated, being under the especial protection of the Turkish sultan, and composed of travellers, merchants, and pilgrims from Europe and Asia. The Egyptian caravan, which starts from Cairo, is not so large as the other, and its route is much more dangerous, waster being scarce, and fierce Arab tribes prowling over the country. The Persian canavan from Babylon, and the Moorish caravan from Morocco, have both become Moorish caravan from Morocco, nave very irregular. The great Indian caravan, which very irregular. Besides these great annual caravans, there are numerous others on a smaller scale, and of a more casual nature, con-stantly going in various directions. Merchants and travellers proceeding in the same direction usually wait upon each other until they can form a caravan for mutual protection, when one of their number is generally appointed to direct their movements. Any trader may form a company in order to make a caravan, and he in whose name it is raised is usually considered the chief, unless he appoint another in his place.

CARAVANSARY, Or CARAVANSERA, kar-a-van-sa-re-(Persian karwan, a trader, and serui, a large house); in Eastern countries is a place appointed for receiving and loading caravans; or a kind of inn where caravans rest at night, except that it presents little but shelter, the traveller being obliged to carry all his provisions and necessaries along with him. They are usually erected by the munificence of princes or other great that the provisions is the provision of the present that the provision is the provision of the present that the provision is the torum of the present that the provision is the torum of the present that the provision is the torum of the present that the provision is the torum of the present that the provision is the torum of the present that the provision is the torum of the present that the pres men, and are situated sometimes in the towns and villages, and sometimes at convenient distances along the road. They are usually large square buildings, with a spacious court in the middle; and under the arches or piazzas that surround them there runs a bank raised some feet above the ground, where the mer-chants and travellers take up their lodgings, the beasts of burden being fastened to the foot of the bank. Over or our act being rastened to the foot of the bank. Over the gates there are sometimes little chambers, which the keeper lets out at a very dear rate to such as wish to be private. They are always supplied with water, which is sometimes brought from a great distance. There are some caravanseras where most things can be had for money; and as the profits of these are considerable, they are usually well stored.

CARAVANSEBASKIER, kur'-a-cun-se-ras-keer' (Persiad), the director, steward, or keeper of a caravansers

CARAVEL, or CARVEL, kar'-a-vel (Fr.), a small vessel used in the herring fishery on the coast of France, and usually from twenty-five to thirty tons burden. It is also applied to a light round old-fashioned ship of from 120 to 140 tons, formerly used in Spain and Portugal.

CARAWAY. (See CARUM.) CARBAMIC ACID, kar-bam'-ik (C2H2NO4).-When dry carbonic acid and dry ammoniacal gas are mixed, a white substance results, which was formerly supposed to be anhydrous carbonate of ammonia. Later investigations proved that it was a compound, containing animonia combined with carbonic acid. Carbamic acid forms salts with numerous other bases, which are

acid forms salts with numerous other bases, which are interesting only in a theoretical point of view.

CARBANIDE, kur-bām-ide (CH,NO), a peculiar-compound, formed by the action of ammonia on oblorocarbonic acid. It is said by Natauson to be identical with ures, in which case the equivalent would require to be doubled, C<sub>2</sub>H,N<sub>2</sub>O<sub>2</sub>. (See UREA.) Carbanide may be regarded as carbonic acid with an equivalent of cryam replaced by an equivalent of cryam replaced by an equivalent of a middown. of oxygen, replaced by an equivalent of amidogen.

CARBAZOTIC ACID, OF PICKIC ACID, kar'-bai-zot'-ik CABBAZOTIC ACID, OF FIGHE ACID, ker-par-zor-set, a complex acid, produced by the action of nitric acid on a number of organic substances; such as phenic acid, salicin, phloridzin, silk, indigo, and a number of the resins. It may be prepared in a variety of ways. A large quantity is furnished by heating one part of indigo with eight or ten parts of intrica acid reduced to coarse powder. As soon as the effervescence of nitrio oxide has ceased, the liquor is boiled and nitric acid added from time to time, until no more gas is given off. On cooling, the carbazotic acid crystallizes out in long, pale yellow, brilliant, not angular plates, which contract with a person who has his camels, tents, ser, and the contract with a person who has his camels, tents, are to be washed, redissolved, and recrystallized, vants, &c., and who undertakes to convey the traveller for a given sum. Sometimes 50,000 or 60,000 persons water, forming a liquid of a bright yellow colour. It is times the number was much greater. The principal stead of hops for making bitter taste, and has been used the holy city are those of Damascus and ployed in dyeing silk and wool, to which, in conjunctions

with cream of tarter or alam as a mordant, it gives a flas yellow colour. Carbarotic acid is sometimes employed as a test for potash, with which it forms a bright yellow crystalline precipitate, even in dilute salutions. Carbarotate of potash is anhydrous, and requires 160 parts of water for its solution; the salts

of sods, ammonis, and the earths, are freely soluble.

CARRIDA, kur-bide, a term now employed instead of combinest to denote the union of carbon with a base.

The more important carbides will be found under the

heads of their respective bases.

CARBINE, or CARABINE, kar'-bine (Fr.), a light kind of musket, about three feet or more in length, used by of mustet, shout three test or more in length, usen by light cavalry, the artillery, the yeomany cavalry, and the Trish constabulary. The carabins, or light cavalry, enrolled by Henry II. of France, about 1560, and the carabineers of Louis XIV., in the latter part of the L7th century, were armed with these weapons; and it is uncertain whether these troops derived their name from that of the gun with which they were armed, or whether the gun received its appellation from that of whether the gun received its appellation from that of the troops. The new cavalry carbine made by Mr. Prince is a rifled breech-loader, with a barrel 26 inches long and 733 of an inch in the bore. It weighs 74 lbs. The carbines used by the British cavalry and artillery

are all rifled.

CARROLIC ACID, kar-bol'-ik (Phenic Acid, Hydrate of henyl, Phenole, Hydrated Oxide of Phenyl, Phenylic Alcohol), (C, H, OHO). — Carbolic acid is a very abundant product of the distillation of coal. Laurent obtained carbolic acid from oil of coal-tar by collecting separately those portions which boil between 300° and 400° Fabr. By mixing with this oil a hot saturated solution of hydrate of potash, a white crystalline subsolution of invitate of potasi, a white crystaine substance separates, the supernatant liquid is decanted, and the crystals are dissolved in a small quantity of water. The solution separates into two portions, the denser of which contains carbolate of potash. The potash is abstracted by the addition of hydrochloric acid, and the liquid carbolic acid rises to the surface. The carbolic acid solution is digested with chloride of all the carbolic acid solution is digested with chloride of calcium to remove water, and afterwards exposed to a low temperature. It then crystallizes in long colouriess needles, which must be kept from contact with the atmosphere. Carbolic acid melts at 95°, and boils between 369° and 370°. The slightest trace of moisture tween 389° and 370°. The slightest trace of moisture is sufficient to cause the liquicaction of the crystals. Carbolic acid is but sparingly soluble in water; it is, however, readily dissolved by alcohol, ether, and accide acid. It has a burning taste, and an odour of smoke re-sembling creosote. Its solution does not redden litmus, and leaves a permanent greasy mark on paper if let fall upon it. A splinter of deal dipped in carbolic acid and then into mitric acid becomes dyed blue. Carbolic seid has lately received an important application as a disinfectant and deodorizer, for a full account of which see DEODORIZATION.

CARBON, kur'-bon (Lat. carbo, a coal), -symbol C, CLEBON, kur-bon (Lat. carbo, a coal),—symbol C, equivalent 6, spec, grav. as diamond 3:55, as graphite 1:9 to 2:3,—an elementary non-metallic solid body, very widely diffused through nature. Its purest and rarset form is that of the diamond (see DIAMONN), but in the forms of graphite and mineral charcoal it occurs very abundantly in nearly every part of the world. It also occurs, in combination with oxygen, as carbonic acid, in small quantities in the air, and in the water of most surings. In combination as carbonic the waters of most springs. In combination, as carbonic acid, with lime and magnesis, it occurs, in enormous quantities, as limestone, marble, chalk, dolomita, &c.; whilst, combined with hydrogen, it enters largely into coal, pest, and liquite. From its invariable presence in all organic matter, it has been called the organic in all organic matter, it has been called the organic chemistry "the history of the wanderings of carbon." From entering thus directly into the vegetable and animal creation, carbon may be considered as the most important element; and the pouring out of carbonic said by animals, to serve for the food of vegetables, is one of the many silent chemical operations constantly going on around us. The wonderful provision of Nature by which the carbonic said cast out by animals as a poisonous product is converted into food for the superior of plants, by the action of the sup'rays, has been controlled in the sup'rays. In a beginning the sup's animals as a poisonous product is converted into food for the support of plants, by the action of the sup'rays, has been controlled into the carbon of the sup'rays, has been controlled into the carbon of the sup'rays, has been controlled into the carbon of the sup'rays, has been carbon of the sup'rays, has been controlled into the carbon of the sup'rays, has been carbon of the sup'rays. port of plants, by the action of the sun's rays, has been the admiration of all philosophers and chemists from the days of Lavoisier to the present time. Carbon, as 442

it exists in the form of the diamond, Ca, is fully described under that head; and the same may be said of graphite, CB, which is treated of under the head of BLACK LEAD. ( Charcoal, or amorphous carbon, Cy, exists as ordingry wood charcoal and laupblack, generally combined with incompletely-burned compounds of carbon and hydrogen. Coke and animal charcoal are other forms of carbon. Charcoal is made by inclosing wood billets in un iron retort, to which is adapted closing wood bilets in an iron retors, to which is agapted a tube for conveying the products of combustion to appropriate receivers, and exposing it to a red heat for four or five hours. Where wood is very sbundant, large heaps, covered with powdered charcoal, learned, turf, and earth, are fired and allowed to burn slowly for a mouth or more. Charcoal prepared in this way to receive the terms of the terms is superior to that burnt in retorls. Animal charcoal, or ivory-black, is prepared in cylinders, in a similar manner to that employed for wood charcoal. Carbon, in its amorphous condition, is a black, dense, perfectly in its amorphous condition, is a black, dense, perfectly opaque, insoluble, infusible, incolorous, tasteless body, conducting heat badly and electricity freely. At ordinary temperatures it shows no chemical affinities. This property has been taken advantage of by the aucienta, who used it for ink. The same property has rendered it a common practice to char the inside of tube and casks intended to hold liquids; and posts and piles partially charred are found to last longer under water than when immersed in their natural state. Finely divided charcoal has powerful antisoptic properties, and it is coming into use as a decorrizer to be used for purifying the nir of sewers. Dr. Letheby's late experiments in this direction appear to prove that, by experiments in this direction appear to prove that, by a proper application of charcoal air-filters, the sir in sewers may be rendered wholesome and pure. Charcoal also has the peculiar property of absorbing colouring matter from organic solutions: hence its use as a decolorizer. At high temperatures carbon combines energotically with exygen, and will remove it from great numbers of its combines; hence its use in reducing metallic oxides. Whatever be its source or form, carbon is chemically the same, and, Whatever be ita when burnt in oxygen, forms carbonic said. Boxwood charcoal was found by Saussure to be capable of absorbing gases in the following proportion:-

Hydrogen		times its	volume.
Nitrogen		,,	23
Oxygen	5.13		52
Carbonic neid			10
Sulphuretted bydrogen	pp.	10	2*
Hydrochloric neid	00.	2>	20
Ammoniacal gas	DO.	**	**

It will be seen from the above table that the more unwholesome the gas, the greater the quantity absorbed; a fact which appears to point to charcoal as the great a fact which appears to point to charcoal as the great disinfectant and deoderizer. Indeed, the great success attending the use of carbon for filters, both for air and water, is a proof of its efficiency in this direction. (See Filters.) Carbon unites with several of the elements to form very important compounds. Its inorganic compounds are treated of under Carbonic Acide Carbonic Oxide: Carbon, Chloride of; Carbon, Bislephide of; Carbon, Chron Rightney of (CS) — equipplent 38.

CARBON, BISULPHIDE OF (CS.),—equivalent 38, spec. grav. 1.27, boiling-point 118.5° Fahr. Only one compound of sulphur and carbon is known. It is prepared by heating fragments of charcoal to redness in a retort; into which dip a tube reaching to the bottom of the charcoal. From time to time sulphur is dropped through the tube, which is closed again immediately.
The sulphur and carbon gradually combine, and the bisulphide distils over into the receiver, which is kept cool with ice. It is at first vellow, from excess of sulphur: but by being re-distilled several times, it is obtained in a state of purity. It is a colourless liquid, with an acrid, pungent taste, and a fastid odour. It is nearly nearly the state of the sta with a blue flame, giving off sulphurous and carbonies acid guees. It dissolves sulphur and phosphorus readily, and these elements may be obtained in crystals by slow evaporation of their solutions. Berzelius looks on bisulphide of carbon as a sulphuric acid corresponding to carbonic acid, which is an oxygen acid.

# Carbon, Chloride of

This idea is borne out by the fact, that bisulphide of surbon will unite with several sulphides to form ealts, which are called sulpho-carbonates,—KO·CO<sub>2</sub>, carbonate of potash; KS·OS<sub>2</sub>, sulpho-carbonate of potashism. The solution of phosphorus in bisulphide of carbon is used in electrotyping objects, which age coated with a film or phosphorus by its means, and rendered capable of receiving an immediate metallic covering when plunged into the solution of sulphate of copper. From certain experiments of Berzelius, it is supposed that a protosulphide of carbon exists. A mixture of bisulphide of carbon and solid carbonic acid produces the most intense cold known.

CARBON, CHLORIDE OF .- There are three chlorides of carbon :-

Protochloride of carbon, C<sub>4</sub>Cl<sub>4</sub>. Sesquichloride of carbon, C<sub>4</sub>Cl<sub>5</sub>. Bichloride of carbon, G<sub>2</sub>Cl<sub>4</sub>.

The first compound is formed by passing the vapour of sesquichloride of carbon through a red-hot glass tube tilled with fragments of glass. Chlorine is liberated, and a colourless liquid obtained, which boils at 240° Fahr. It is regarded as a derivative of oleflant gas, C<sub>a</sub>H<sub>4</sub>. The second is formed by acting on Dutch liquid under the influence of solar radiation. It is a volatile crystalline solid, with an aromatic odour resembling camphor. It fases at 320° and boils at 360°. Its specific gravity is 2, and it is soluble in ether and alcohol. There is also a liquid sesquichloride with the formula C<sub>2</sub>Cl<sub>3</sub>, which was obtained by Regnault by passing the vapour of bichloride of carbon through a tube heated to redness. The third, which is often called perchloride of carbon, was obtained by Regnault from wood-spirit and from chloroform by the combined action of chlorine and the sun's rays. Kolbe forms it by passing bisulphide of carbon and oblorine through a red-hot tube. It is a colourless liquid, possessing a peculiar alliaceous edeur, and boiling at 172° Fahr. At -0° Fahr. it becomes a solid of pearly crystalline appearance. Besides these compounds of chlorine and arbon, Faraday obtained a sub-chloride of carbon (C<sub>4</sub>Cl<sub>3</sub>), which formed fine silky crystals, subliming without change by passing the protochloride several times through a red-hot tube.

CARDON, OXYCHLORIDE OF (Chloro-carbonic Acid, Phosgane Gas),—spec. grav. 3.68, symbol COCl.—When equal volumes of chlorine and carbonic acid are exposed.

CARDON, OXXCHLORIDE OF (Chloro-carbonic Acid, Phosgene Gras),—spec. grav. 3-68, symbol COCL.—When equal volumes of chlorine and carbonic acid are exposed to the sun's rays, they gradually combine, and condense into half their volume. Oxychloride of carbon is a suffocating gas, which is decemposed by water into carbonic acid and hydrochloric neid. It may also be formed by passing carbonic oxide through pentachlo-

ride of antimony.

CARBONAEL, Eur-bo-na're (Ital., colliers, or charcoalburners), the name assumed by a large political secret society of Italy, which first emerged from its concealment in 1820. We are still in a great measure ignorant of the nature of this society; for though it has published instructions, catechisms, statutes, and rituals, yet the real spirit of the society and the motives of the leaders are unknown. The stories regarding the great antiquity of this confederation may well be passed over as unworthy of credit. Botta, in his Storia d'Italia, is more likely to be correct in stating that it originated in the republicans who, under Murat's government, equally hating the French and King Ferdinand, fled to the wild recesses of the Abruzzi, where they formed themselves into a secret confederacy under the name of Carbonari. Their leader, Capobianco, is said to have been a man of great rheorical powers. The ritual of the Carbonari was taken from the vocation of charcoal-burning, and their war-cry was "Revenge for the lamb torn by the wolf." Clearing the forest of wolves (opposition to tyrenny) was the basis of their symbols. By this they probably at first meant only deliverance from foreign domiuson; but in later times it denoted freedom from all despotic rule,—antimonarchical and democratic principles having taken possession of them. Among themselves the initiated were styled "good cousins." The place of meeting was called a hut (ba-nacou), the outer district a forest; the interior of the hut was the realita, the place for selling charcoal. The More and the reality of the society it numbered from 24,000 to 30,000 members; and it is said that

# Cerbenie Acid

during the month of March, 1830, no fewer than 68 new members were initiated. The religious and testant nature of the confederacy is evident five rules, one of which declares that "Bucy Carbo has the natural and unationable right to worship has the natural and unationable right to worship." according to his own views and convictions." The bonari seem to have borrowed many of their for from the Freemasons, though they did not spring fro them. After the suppression of the Neapolitan Piedmontese revolution of 1821, the Carbonari through out Italy were declared guilty of high treason, punished as such by the laws. After the restors of the Bourbons, numerous searet societies for themselves in France; and they became united with the Carbonari at Paris in 1820. Soon after this Paris became the head-quarters of Carbonarism, which from this time assumed more of a French character. The initiate were bons cousins; the uninitiated, pagent, or heathens. No written communications were allowed among them, and all intercourse had to be carried on by word of mouth. All treachery was punished by assassination. From the time of its establishment in France to the end of the French and Spanish war, Carbonarism in France was very active. At that time its activity received a check, and it ceased to manifest itself by any open attempts against the government. The society, open attempts against the government. The society, however, continued to hold together till the revolution of 1830; after which many of the most influential of the members attached themselves to the new government, and the society was at length dissolved. In its place, however, the republicans formed themselves into a new society, borrowing the character and forms of the old, and taking the name of the Charbonneris dissections. It was founded for carrying out the winefcratique. It was founded for carrying out the princi-ples laid down by Teste in his Projet d'une Constitution ripublicaine, which were those formerly advocated by Babeuf, and had at its head Buonarotti, a fellow-conspirator of Babeuf. All the operations of this new society centred in Paris, a mode of proceeding which gave offence to the Italians who had joined them, who seceded, and formed themselves into a separate body under the name of "Young Italy." Carbonarism is not known to exist in France at present, the latest trace of it having been found in the south of France in 1841; but it is reported to be still in existence in Italy, or, at least, to have been so up to the recent series of changes.

CARBONIC ACID, kar-bon'-ik (CO<sub>3</sub>),—equivalent 23, spec. grav. 1·529.—Carbonic acid is the product of the combustion of all substances containing earbon. It occurs in combination with metallic oxides in the mineral kingdom, also dissolved in mineral springs. It issues from the earth in volcanic districts, and forms the deadly choke-damp of the coal-mines. It is also a product of respiration, fermentation, and putrefaction, which is nothing more than slow combustion. It is easily prepared by acting on a carbonate, such as chalk or marble, with nitric, sulphuric, or hydrochloric acid, in a gas-generating apparatus. The carbonate of lime is converted into chloride of calcium, and the carbonic acid escapes as gas.

Carbonale of Hydrochloric Chloride of Carbonic Lime. Acid. Calcium. Acid. Water.

Carbonic said is known in the solid, liquid, and gaseous states. By a pressure of thirty atmospheres at \$2° Fahr., it is liquidied, the pressure required decreasing as the temperature gets lower. Liquid earbonic said is colourless, insoluble in water and fatty oils, but mixing in all proportions with ether, sicohol, bisulphide of carbon, naphtha, and turpentine. At \$-94° Fahr. it solidities into a vitreous transparent mass. Solid carbonic acid is best prepared by Thilorier's method, by generating carbonic acid in a condenser until it is liquid, and then allowing it to escape through a stop-cock into the sir. The liquid gas evaporates with such rapidity, that intense cold is produced, and the remainder is converted into snow. It is a bad conductor of heat, and may be handled with impunity, a fim of gaseous carbonic acid always protecting the hand from injury. If pressed upon the skin, a bister is produced similar to that caused by a burn. It is used, in conjunction with ether and simplified of carbon, for producing intense cold. Gaseous carbonic acid is colour.

## Carbonic Oxide

less, possessing slightly seid smell and taste. At ordinary temperatures it dissolves in water in the proportion of bulk for bulk. By pressure, water may be made to take up great quantities of the gas, the same volume being always absorbed, no matter how great the presure, the gas escapes in bubbles. A familiar instance of this occurs in the effervescence of bottled heer or sărated waters. When inhaled, carbonic soid produces death, even when much diluted. A lighted candle is generally used to test an atmosphere suspected to contain carused to test an atmosphere suspected to contain car-bonic scid; but it is found that air that will support compusion will contain sufficient of this gas to cause insensibility and dangerous illness. Carbonic acid produced during respiration may be shown by breathing through a tube into lime-water, which is at once ren-dered cloudy by the formation of carbonate of lime. The ill effects of crowded rooms are owing to the systemic depression produced by small quantities of car-bonic acid. Carbonic acid was formerly called fixed mir, from the fact of its having been discovered solid or fixed constituent in limestone by Dr. Black Though a feeble acid, and easily separable from its combinations, carbonic acid unites with the metallic oxides, forming a very numerous and impor-tant class of salts, the carbonates, descriptions of which will be found under the headings of their bases. The carbonates of the alkalies are soluble in water, the carbonates of the other metallic bases being for the most part insoluble, except the water is highly charged with carbonic acid. Hard water contains carbonate of lime or magnesia, held in solution by the carbonic acid contained in the water : hence, when the gas is dissipated by boiling, the carbonate of lime is precipitated, incrusting the vessel in which it has been boiled. Carbonic acid contains one equivalent of carbon, united with two of oxygen. Its true composition was discovered by Lavoisier, who bestowed

composition was discovered by on it the name it bears.

Carbonic Oxide is produced when carbonic acid is passed over red-hot charcoal; from which it will be seen that this gas is formed during the combustion of almost every organic substance. The first result of a contract of the carbon which is passing combustion is, of course, carbonic acid, which, passing over the red-hot coals or wick, as the case may be parts with an equivalent of its oxygen. The gas, however, is inflamed as fast as it is formed, and reconnected with carbonic acid. It is generally prepared by the decomposition of exalic acid by sulphuric acid. Oxalic acid consists of  $C_2H_3$  united to an equivalent of water, without which it does not appear to be able to exist. The sulphuric acid abstracts this equivalent of water, The surpture and solverstant of equivalent of water, leaving the C<sub>3</sub>H<sub>2</sub> at liberty to separate into CO, carbonic oxide, and CO<sub>2</sub>, carbonic acid. The latter is absorbed by passing the mixed gases through milk of lime. Carbonic oxide gas thus prepared is colourless and inodorous, burning with a blue flame, and giving rise to carbonic acid. It supports betther combustion por respiration, one per cent, mixed with air being sufficient to cause dangerous drowsiness. It is now satisfactorily proved that the coma generally resulting in death produced by the combustion of charcoal in close rooms, is due to the formation of carbonic oxide by the carbonic acid formed during combustion, being It is a neutral body, has no action on itmus-paper, does not combine with acids or bases, and has never been liquefied: it is slightly soluble in water. In metallurgical processes carbonic acid plays an important part by supplying fuel as fast as it is formed.

CARROTTERIOUS SYSTEM, kar-lon-if-e-rus, in Gool., the name given to the great assemblage of fossiliferous strata resting upon the Old Red sandstone, and capped by the Permian series. To this system the great coalfields of the world belong. It consists of alternations of sandstones, shales, clays, limestones, coals, and ironstones, in every degree of admixture and purity, and of every condition of formation,—terrestrial, fresh-water, estuary, and marine. In the strata there have been discovered fossils representing all the great forms of life, with the exception, perhaps, of true dicotyle-donous plants in the vegetable kingdom, and of birds

#### Carbunole

fossil vegetation which marks almost every stratum, and which, in numerous instances, forms thick seams of solid coal. Although this coaly or corbenaceous aspect prevails throughout the whole, it has been found convenient to arrange the system into three groups,—the Lower Coal-measures or Carboniferous Slates, the Mountain or Carboniferous Limestone, and States, the Mountain or Carbonicrous Limited and the Upper or True Coal-measures; or, more minutely, according to the views of most British geologists, into the following series:—I. Upper Coal-measures; 2. Mountain Limestone; and 4. Lower Coal-measures, Other subdivisions have been attempted. according to the local peculiarities of different coal-fields; but it is enough for the purposes of the general reader to know, that all these minor arrangements can be readily co-ordinated with one or other of the above four series. In recapitulating his admirable account of the Carboniferous system, Mr. David Page remarks:— "Looking at the whole succession and alternations of the strata,—the sandstones, clays, shiles, limestones, ironstones, and coal,—and noting their peculiar fossis,—the estuary character of the shells and fishes of the lower and upper groups, and the marine character of the corals, encrinites, shells, and fishes of the middle group, with an excess of terrestrial regetation throughests. group, with an excess of terrestrial regotation throughout,—we are reminded of conditions never before or since exhibited on our globe. The frequent alternations of the strata, and the great extent of our coalfields, indicate the existence of vast estuaries and inland seas, of gigantic rivers and periodical inundations; the numerous coal-seams and bituminous shales clearly bespeak conditions of soil, moisture, and warmth favourable to an exuberant vegetation, and point partly to vegetable drift, and partly to suberroad forests to next-awams and estuarine implest merged forests, to peat-swamps and estuarine juugles; the mountain-limestone, with its marine remains, reminds us of low tropical islands fringed with coral reefs, and lagoons thronged with shell-lish and fishes; the existence of reptiles and insects tells us of air, and sunlight, and river-banks; the vast geographical extent of the system bears evidence of a more equable climate over a large portion of the earth's surface; while the interstratified trap-tuffs, the basaltic outbursts, and the numerous faults and fissures, testify to a period of intense igneous activity—to repeated upheavals of seabottom and submergencies of dry land. . . . The natural conditions under which the system was formed are not more wonderful, however, than the economical importance of its products, —building stone, limestone, marble, fire-clay, alum, copperas, lead, zinc, silver, and above all, iron and coal, are its principal treasures - conferring new wealth and comfort on the country that possesses them, and giving a fresh and permanent impatus to its industry and civilization."— Ref. Page's Admanced Text-book of Geology. Carbuckle, kar-bank-kl (Lat. carbucalus, a little coal), in Surg., is a broad, flat, firm, burning tumour,

usually of considerable size. It occurs most commonly in middle life, and in those who indulge freely in the pleasures of the table. It begins with a hard, painful swelling, of a livid colour, which rapidly enlarges. The pain is severe, and is much increased by pressure; the patient is much depressed, and a general derangement of the system takes place. Vesicles form on the part, which soon open, and discharge a thin viscid fluid, with occasionally sloughed portions of disintegrated tissue. Sometimes these apertures run into each other, and form large openings. The predisposing cause of this disease is a derangement of some of the secretions of the human body, which is to be remedied by purgatives and other medicines suited for each particular case; the system being at the same time supported by tonics and a nourishing dict. This, however, is not enough,—an early and free application of the knife is necessary to the part itself. An incision, usually in the crucial form, throughout the whole extent of the diseased mass evacuates the purnlent formation, and affords an exit for the sloughs when loose. Potassa fusa is also to be freely applied, in order to produce a separation between the healthy and diseased parts, and to prevent injury to the system from absorption of

diseased matter. donous plants in the vegetable kingdom, and of birds | Carryngle, a large gurnet, cut en calochon; i.e. and maximals in the animal kingdom. The most convex on the under side, and concave on the upper, striking peculiarity in the system is the profusion of The light is generally reflected in a flame-like form.

## Carburetted Hydrogen

hence the name. The clear deep-red garnets from Pegu are most highly valued. There are many substi-tutes for garnet, such as the cinnamon-atone, which, when cut en cabockon, deceive even mineralogists. For

The chemical composition of the carbuncle, see Garner.

Carburers, barburers, (See Hadrogen.)

Carburers, karburers, Carburets are now called carbides, the word being more analogous to chloride,

CARDYLE, SULPRATE OF, kar'-bile, ethronic anhydrine, so called by its discoverer Magnus. It is a combination of four equivalents of sulphuric acid with one

of oledant gas. (See ETHIONIC ACID.)
CARCASS, kar-käss (Fr. carcasse), in Mil., a destructive missile discharged from a mortar, like a shell, and designed to set fire to buildings and stores belonging to the enemy. It is a hollow spherical case of iron, perforated with three holes, and filled with combustible matter, which blazes furiously from these apertures, and cannot easily be extinguished. The composition, which resembles in many points the famous Greek fire of the Byzantines, burns for nine or ten minutes, and is lighted by fuses placed in the holes, which ignite at the moment of discharge. The 13-uch carcass contains 18 lbs. of composition, and weighs nearly 2 cwt. They are said to have been first used in Germany about 1670.

Carcass, in Build., a term applied to the bare walls and roof of a house, and the joists of timber running from wall to wall to support the flooring. It is merely the shell of the building, devoid of external decoration, doors, windows, and any internal fittings. The joists that support the floors and ceiling are sometimes called the carcass-flooring, and the frame of the roof that supports the tiles or slates the carcass-roofing.

CARCERULE, kar'-se-rule (Lat. carcer, a prison), in Bot., a superior many-celled fruit, each cell being dry, indehiacent, and one or few-seeded, and all more or less cohering by their united styles to a central axis. The fruit of the common mallow is a good example.

CARDAMINE, kar'-de-mine (from Gr. kardia, heart or courage, on account of its strengthening properties) in Bot., a gen. of plants belonging to the nat. ord Crucifera. C. pratensis, the Cuckoo-flower, or Lady's smock, is an indigenous perennial met with in meadows snock, is an indigenous percental met with in meadows and moist pastures, blossoming in the mouths of April and May, when its flowers, which are flesh-coloured, white, or light purple, present a very pleasing appearance. Formerly the flowers were used medicinally, as a remedy in epillepsy. The leaves are antiscorbutic, and are sometimes enten as watercress.

CARDAMOMS. (See ELETTARIA and AMONUM.) CARD-BOARD, or CARD, kerd-bord (Fr. carte, card; Sax. bord, board), a substance made by pasting together several layers of paper. The number of these layers and the description of paper employed regulate the thickness and quality of the card-board produced. Ordinary card-board is made of fine white paper outside, with several layers of cartridge-paper between. Bristol-board is made altogether of fine white paper. Mill-board is made of coarse brown paper, layers of which are glued together and pressed. It is mostly used by bookbinders. Cards are enamelled by brushing them over with a mixture of china-white and size.

After being rubbed with some fuely-powdered tale, they are polished vigorously with a brush.

CARDIA, kar'di-ā (Gr., the heart), in Anat., is the mane given to the superior opening of the stomach, on

account of its being situated near the heart.

CARDIAC MEDICINES, kar'-di-āk, are cordinls or stomachic and stimulating medicines, which are given

to raise the spirits.

CARDIACEM, kar-di-ai'-se-e (Gr. kardia, the heart), a fam. of bivalve Mollusca. They have a thick, closed, equivalve shell, with the umbones usually bent round, so that the shell, when seen from either extremity, presents a more or less cordate appearance. The hinge-teeth are strong, from one to three in each ange-teem are strong, from one to three in each raive, and there are usually one or two smaller teeth on each side of the hinge. The animal possesses two adductor muscles.—(Dallas's Animal Kingdom.) The Species of this family are very numerous, and greatly vary in size, some of their shells being remarkable for the multiple and dallager of their contraction. the emallness and delicacy of their construction, type of the family is the Cockle. (See Cockle.)

# Cardinal

Carrialets, kar-di-W-ji-U (Gr. kardis, and signs, pain), in Med., denotes pein or an uneasy sensation in the stomach, accompanied with anxiety, a heat magnet less virulent, sometimes attended with oppression of fainting, and frequently with an inclination to wond, or a plentiful discharge of clear lymph-like saliva. (See

or a plentiful discharge of clear tympus many that the matternum, Industries.

Cardinals, kar'-di-add (Lat. cardinals, principal, from cardo, a hinge), is a term used in various connections to denote the chief, principal, or fundamental parts of a thing. Thus, we speak in grammer of the cardinal numbers, in moral philosophy of the cardinal virtues, in cosmography of the cardinal points, and in mateorology of the cardinal winds. It was also the meteorology of the cardinal winds. It was also the name given, under the emperor Theodosius, to the highest officers of the state, as it is in the present day to dignities in the Roman Catholic church.

CAEDINAL, the highest dignity in the Roman Catho-e church next to the pope. The cardinals were at lic church next to the pope. The cardinals were at first only the principal priests or incumbents of the purishes of Rome, which was early divided into parishes. Afterwards it came to be applied to the chief priest of any parish, who was alone allowed to baptize and administer the Eucharist. The title continued to be thus general down to the lith century, when the popes, having grown powerful, formed a college or secret council of ecclesiastics of high rank to assist them in their duties, to whom alone the title of cardinal was soon reserved. At first, the title was confined to ecclesiastics in Rome or its neighbourhood; but afterwards it came to be conferred upon others at a distance, Conradus, archbishop of Mayence, being, it is said, the first who received this honour from Pope Alexander III. In 1160 the cardinals obtained, after much opposition on the part of the other clergy, the exclusive right of choosing the pope, and Innocent IV gave them a rank above the bishops, together with the red hat. Boniface VIII., in the beginning of the 14th red hat. Boniace viii. In the beginning of the century, assigned to them the princely mantle, and Urban VIII. gave them the title of "sminence" instead of "most illustrious." The number of cardinals has varied greatly at different times. In the 12th century they rarely exceeded thirty, and in the 13th there was at one time but seven. In 1516 there were only thirteen, and in 1569 the highest number, seventy-six, was reached. The council of Basel decided that there should be twenty-four; but Sextus V. fixed their number as a seventy. To correspond with the seventy elders of at seventy, to correspond with the seventy elders of Israel. This last has since been adhered to; but the number is seldom full (it was so, however, in 1853, when eight new cardinuls were created), the pope general control of the c rally leaving some vacancies for extraordinary cases. The pope may select cardinals from any country, but with a preference for Italians; and in 1850, of the sixty-seven cardinals, fifty-one were Italians. Their creation occurs first in a secret conclave of cardinals, and is then publicly repeated. The person appointed and is then publicly repeated. The person appointed is solemnly received in a public session of the consistory, and decked with a cardinal's hat. The promotion is completed at the close of the next secret conclave, which the new cardinals attend. In the case of cardinals who cannot attend, the pope dispatches one of his chambermen of honour to carry to them their cap; but they must receive their hat at his own hands. Their dress consists of a surplice with a short hands. Their dress consists of a surplice with a snor-purple mautle, and a small cap, over which they wear the hat, either red or violet, with silk strings and tassels at the end. They have also a ring of sapphire, set in gold, which is worn on the fourth finger. They are divided into three classes, viz., six cardinal bishope, fifty cardinal priests, and fourteen cardinal deacons. In the first class are the bishops of the six suffragan sees of the Roman province; viz., Ostia, Porto, Albano, Tusculum, Sabina, and Præneste: the others generally derived an honorary title from some of the churches of derived an honorary title from some of the cancenes of Rome. In their own college, cardinal bishops rank first, the others according to the date of their appoint-ment. The oldest cardinal bishop residing in Rome is dean of the college of cardinals. This college is the pope's council in all important cases, especially in all ecclesiastical matters, in which he must consult them. Cardinals are alone eligible to the papal chair, and as soon as this becomes vacant, they form a conclare to elect a successor. (See CONCLAVE.) As the pope is both a temporal and an eoclesiastical sovereign, the

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ardinals occupy civil as well as epiritual offices. The ordinal chamberiess the country of the treasury and inriediction in the court; the cardinal vecretary of state he calinet minister and foreign secretary; the constant vice-chanceller is chief of the chancery; the constant vice-chanceller is chief of the bureau of briefs is chief of the bureau of briefs, recently combined with that of foreign affairs; briefs, recently combined with that of foreign affairs; the cardinal secretary of the interior was first instituted in 1833; the cardinal penitentiary and the cardinal productive are chief of their respective departments. The congregations (which see) are also under the direction of cardinals. The council of cardinals, when casembled under the pope for the discussion of matters.

assumpted under the pope for the discussion of matters affecting the church or the state, is called a consistorm. (See Consistorm.)

CLEDINAL BIRD. (See GROSBEAK.)

CARDINAL NUMBERS, in Gram., are the numbers one, two, three, &c., as distinguished from first, second, third, &c., which are called ordinal numbers, as denoting order.

CARDINAL POINTS, in Cosmography, are the four points of intersection of the horizon with the meridian and the prime vertical circle, or, north, south, east, and west. The cardinal winds are those which blow from the cardinal points. In Astrol., the cardinal points of the heavens, or of a nativity, are the rising and setting of the sun, the zenith, and nadir.

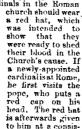
CARDINAL SIGNS, in Astron., are-Aries, Libra, Can-

cer, and Capricorn.

CARDINAL VIRTUES, a term applied in Morals to those virtues which are supposed to comprise all the rest, or to which all the others are subordinate. rest, or to which all the others are supordinate. This distribution of the virtues originated in the ancient Greek philosophy. It is to be found in the teaching of Socrates, as recorded by Xenophon, and was further developed by Plato, who makes them out to be Justice, Temperance, Fortitude, and Prudence. According to Dr. Whewell, this division "fails altogether: ing to Dr. Wheweil, this division "fulls altogether; since the parts are not distinct, and the whole is not complete." He gives in another, which to us seems liable to the same objection; viz., Benevolence, Justice, Truth, Parity, and Order. The Roman Catholic moralists have adopted the ancient division of the cardinal virtues, to which they add what are termed the theological virtues; viz., Faith, Hope, and Charity, making the entire number seven.

Carninal's Har (Lat. cardinal's respectively).

CARDINAL'S HAT (Lat. cardinalis, principal).—In-





CARDINAL'S HAT.

tory, and the proceeding is accompanied by a number of symbolical ceremonies. Except in the case of members of a royal house, the cardinal's hat is always given by the pope's own hands. Some cardinals who have not visited Rome have died without receiving it. The red cap is always sent to a chosen cardinal if absent.

CARDING MACHINE, kar-ding (Du. caurd), a machine in which the fibres of cotton are combed or carded, to disentangle them from each other, and bring them into a proper condition for spinning into cylinders or drums to which strips of leather are fastened, which are perforated with numerous wires regularly arranged. The wires are short and stiff, and the larly arranged. exterior of the cylinder resembles a circular brush. externor of these cylinders are arranged in a strong wooden frame, so that the wires nearly meet, and are set in motion by machinery connected with a steam-engine or water-wheel. The cotton is put into the engine or water-wheel. The cotton is put into the machine at one end, and is rapidly whirled round from sylinder to cylinder until it comes out at the other end in the form of a filmy fleece; this is received on ano-

ther cylinder called the "deffer," from which it is removed by the doffing lattle, and gathered into a marrow make by, passing through a funnel-shaped affecture. It is then ready to be drawn out and spun into yarm and thread. The combs of cards of wire with which the cylinders are coated were formerly made by hand, but they are required in when quantities in Lancashire and the manufacturing districts that they are now made by machinery, invented by Mr. Dyar, of Manchester, in the early part of the present country. part, the wires being also cut in the same machine. These machines for making cards for the cardingengines are very complex and beautiful in construc-

cigines are very complex and beautiful in constitution; each will cut and fix about 500 wires per minute. Cardiosperatum, kar-di-os-per-num (Gr. kardie, heart, sperma, seed, in reference to the shape of the seeds), in Bot., a gen. of plants belonging to the nat. ord. Supindacea. The root of the species C. kaliczcabum is described as disrectic, disphoretic, and spe-rient. The leaves are boiled and esten as a table

vegetable in the Moluccas.

Carottis, kur-di-tis (Gr. kardia, the heart, terminal tile), in Path., denotes inflammation of the heart, It is characterized by pain in the region of the heart, great anxiety, fever, difficulty of breathing, palpitation, cough, irregular pulse, and fainting. It is applied properly to inflammation of the muscular tissue of the heart itself; but this is a form of disease that rarely neart tracit; out this is a form of orease that farely occurs alone, being usually accompanied by pericarditis, or inflammation of the pericarditis, or inflammation of the lining membrane of the heart. The symptoms and treatment in each case are similar. (See Hzart, Diskashs Or.)

Cardon, kur-doon'(Sp. cardon), a garden vegetable, introduced into this country.

introduced into this country about the middle of the 17th century from the south of Europe. It bears a great Europe. It bears a great resemblance to the artichoke, and belongs to the same bo-tanical genus. (See CYNARA.) The tender stalks of the inner leaves, rendered white and crisp by earthing up, are used for stewing, and for soups and salads during the winter. With the florets of the cardoon, called cardo do coulho, the Portuguese for-merly congulated milk for cheese-making.



CARDOON.

CARDS, PLAYING, kards .- Neither the country nor the date of the introduction of playing-cards is known. Possibly they came from the East; for the Chinese and Hindoos have playing-cards that are clearly not of European origin. The manufacture of these articles is a very important one in this country, playing-card makers having been a large and influential body for the last four centuries. The manufacture is carried on under peculiar restrictions. No person is allowed to manufacture them, except in the cities of London and Westminster and Dublin, the manufacture being entirely forbidden in Scotland. They pay a duty of one shilling per pack, which is levied by means of the one staining per pack, which is a government stamp. The aces are printed at Somerset House, on paper furnished by the card-maker, who has to pay for the engraved plate from which they are printed. The ace plates, of which two are necessary, one for the home and the other for the export stamp, cost £30 each. When the aces are required, a requisition is sent in for a ream, containing g.600, and an officer is sent round to every cardinaker, at certain intervals, to seal the pagks containing the sees drawn from the stock. The fluty is collected by the number of seals being counted, the aces not made into cards not being charged for. The stock of sees is counted from time to time, and any deficiency has to be paid for the manufacturer being called on to scoon to for such an irregularity. When playing-cards are exported, the nanufacturer must enter into a heavy bond that the cards will be landed at the port

## Carduelis

specified, to insure a drawback of three halfpence per pound. The income desired from the tax on playing-cards is about £12.000 a year. The cardback used in England for playing-cards is made of thus sheets of Ragiand for playing-cards is made of four sheets of paper. Two strong sheets of cartridgs-paper are first pasted together, dried, and pressed: hees are afterwards covered on each side with a sheet of strong well-sized paper. They are generally painted by means of stencil-plates, with a mixture of water-colour and paste. When painted and dried, they are rubbed with Oastille scap and glazed with a flint. The operation of glazing is tedious and delicate, and causes much waste. The outlines of the court eards and the covarients on the heaver are printed with the ordinary ornaments on the backs are printed with the ordinary letter-printing press. When finished, they are cut up and sorted; the best quality being called "Moguis," the second best "Harrys," and the third "Highlanders," the names being given from the figures on the wrappers. They are then tied in packs, and scaled one wrappers. They are then ned in packs, and sealed by the revenue officer, as before explained. Messrs. De la Rue, of Bunbill Itow, are the first among our English playing-card makers. These gentlemen have, by every mens in their power, tried to render playing-cards works of art, not only on their backs, but on their fronts also. In the former they have succeeded admirably some of the designs being from the hand of mirably, some of the designs being from the hand of Mr. Owen Jones and other eminent artists. tried to reform the public taste by substituting artistic figures of kings and queens for the impossible caricatures in use; but they were compelled to abandon the attempt, after having incurred a very heavy loss. There has been little or no improvement of note in the manufacture of late years, the only important change being the introduction, by Messrs. De la Rue, of a method of printing the cards from metal or wood blocks. A pack of cards exhibited by this firm in 1851, with the backs ornamented in chromo-lithography, cost nearly £1,000. The designs were by Mr. Owen Jones, and consisted of the monograms of the different members of the royal family, wreathed with emblematical flowers. They also exhibited a pack of cards for the use of near-sighted people, the four kinds of pips being printed in four different colours.

CANDUSLIS, Kür-du-o'-lis (from Lat. carduus, a thistie, on account of their love for the seeds of the thistie), a gen. of birds of the Finch tribe. (See

GOLDFINCH, CANARY, &c.)
CARDUUS, kar'-du-us (Lat., a thistle), in Bot., the
Thistle, a gen. of plants belonging to the nat. ord. Composite, consisting of numerous species, some of which are noble-looking flowers. C. benedictus and a few others have been used in medicine as tonics and febrifuges.

CARE OF CARLE SUNDAY, kair, karle, is the second Sunday before Easter, or the fifth Sunday from Shrove-It was formerly a custom in many parts of England to have groy peas steeped and fried in butter, and given away to be esten on this day. These were called carlings. It seems to have arisen from an old Romish custom of eating steeped beans on this day, custom which probably originated from some earlier heathen practice.—Ref. Brand's Popular Antiquities.

CARENING, kār-cen'ing (from Fr. carener, to carean), the process by which a ship is laid down on one side in the water, in such a manner as to expose the other for the purpose of cleaning. It is seldom or ever now used in the British navy, as the copper sheathing with which our vessels are lined prevents, in a great measure, their fouling; and the docks and newly-invented hydraulic lifts by which ships can be raised out of the water render it unnecessary. The Great Eastern, for instance, in 1860 was lifted by the latter means and placed upon a kind of dock called a gridiron in Milford Haven, and was thus enabled to be renaired and cleaned without the dangerous and diffi-

repaired and measure without the dangerous and diffi-cult process of gareening.

CARET, kird-ef (Lat. caree, I want), in Gram., is a mark thus a, used to denote that something has been omitted, and that it is interlined.

# Caries

s, and the plants are som tivated for this purpose on the dyles of These stems, improperly called room, have-medicinally as substitutes for seresperills, name of German sarsaparilla.

Caroanous, kar-gal-dors, is a term applied by the Dutch to a kind of brokers whose business it is to find freights for ships, or ships for freights, and to give notice to merchants of ships that are ready to sail.

CARGO, kar'-go (Span. cargo, a load or bunden), is general name for all the goods and merchandise carri on board a trading vessel. It is sometimes applie on board a trading vessel. It is sometimes applied, also, to the invoice of the goods wherewith the slag is laden. The person often seat with a this is charge of the cargo, and authorized to dispose of it to the best advantage, is called the supercorgo.

CARICA, kai'-re-ka (from being erronsously suppose

to be a native of Caria), in Bob, a gen. of plants be-longing to the nat. ord. Papayaccae. The species are natives of South America and the tropical regions of the old world. The aorid milky juice of O. depitors. the old world. The sarid milky juice of the distants is said to be a deadly poison. The juice of the unripe fruit, and the powdered seeds of C. papaya, are powerful anthelmintics; but the fruit, when cooked, is edible. This plant is said to have the property of rendering meat tender. It is stated that newly-killed meat hung among the leaves soon becomes soft and delicate, and that the flesh of old hogs and old poultry fed on its fruit or leaves is remarkably tendar. leaves are used in some districts as a substitute for scap. The juice is said to be a highly animalized pro-duct, resembling animal albumen in its characters and reactions.

CABICATURE, kår-e-kå-ture' (Ital. caricare, to lead or overcharge), is a representation in which certain parts or peculiarities of an object are exaggerated, but in such a way that the general likeness is preserved, or even made more striking. Though the effect of caricature is generally so produce laughter, yet this idea is not invariably associated with it; for caricature may produce niter or even herror. Caricature in the nice. produce pity, or even horror. Car esture in the piotorial arts occupies the same place that buriesque does in literature. The legitimate objects of the one and of the other are the vices and follies of individuals or of classes, and all disagreeable peculiarities of manner and appearance which arise from these. External deformities, which do not spring from the fault of the persons afflicted, can never he proper subjects of caricature. The ancients employed caricature, as we find from their masks. Among Italian painters, Leonarde da Vinci is a master of this art, representing the quarrelsome, braggart, peevish, gluttonous, clownish, with an exaggerated fidelity. Among the French, Callot, and among the English, Hogarth, stand prominently out in this walk. The Italians have too strong a sense of the beautiful to have a great relish for caricatures, and the Germans are too grave to excel in these sportive productions. The French caricatures are rather exaggerated representations of life than satirical conceptions. The English exhibit a greater approcuother people. Some of the best specimens of carica-ture of any time or nation are to be found in the pages of the hebdomadal Punch.

CARLES, kai'-reez (Lat., rottenness), in Path. Anat. is a disease of the bones analogous to ulceration of the soft parts. It differs from necrosis, in that, in the latter, the bone is destitute of vitality, which is not the case when it is simply carious. Necrosis corresponds to mortification of the soft parts. Caries most frequently attacks the bones of the spine; but it may after any of the bones, especially such as are of a spongy texture, as the carpal or turns al bones, or the heads of the long bones, where they form articulations. The young, or those of a scrofulous habit of body, are most subject to this disease. It sometimes appears spontaneously; at others, as the result of an injury, as a blow or fall. It begins with inflammation, usually about the state of tended with a dull, heavy pain and weakness in the part affected. In course of time an abscess forms, omitted, and that it is interined.

Carax, kai-reks (from Lat. carse, I want, the upper spikes being without seeds), in Bot., a gen. of plants being without seeds), in Bot., a gen. of plants being in the nat. ord. Cyperaces, or Sedge family, of which are British. The creeping stems of C, which are British. The creeping stems of C, arenaria and other species help to bind the sands of affected, and paralysis generally sets in. At the assemble of the spine takes places, arenaria and other species help to bind the sands of affected, and paralysis generally sets in.

ticulation of the hones, the part sularges, the cartilages become affected, and amputation or excision of the joint is aften necessary, in order to save the patient's life. Much may be done in arresting the progress of this disease, at least in its earlier stages. For this purpose, the patient should be strengthened by good air and nourishing diet, at the same time that rest is enjoined: the state of the stomach and bowels should also be attended to. In the local treatment of the disease, blisters, leeches, and issues, are to be employed. The abscesses are best left to nature, unless they are productive of much uneasiness. When they have buret, the exfoliation of the diseased part should have burst, the exceptation of the diseased part should be expedited as much as possible, so that the healthy

portions of the bone may granulate and heal.

CLREKLONS, kir-il'-lons (Fr.), a name given to small massiuments furnished with bells (properly tuned), that are coted upon by finger-keys, like those of a pissoforte, and used for accompanying certain songs where the ringing of church-bells is to be imitated. and where dampers are not used for preventing the continuance of the sound. The steeples of some of the churches in Holland and some parts of the Netherlands are furnished with a large series of bells, tuned accurately to the tones and half-tones of the scale. They are connected at one end by wires with hammers, that strike the bells, and at the other with keys, and pedals for the lower notes of the scale. The persons who play these instruments (called carilloneurs) find it rather hard work, as the carillons are played by striking the keys rather forcibly with the hands and feet. The keys of these instruments are projecting sticks placed far enough apart to enable the performer to strike them with violence and velocity by the two hands edgeways, connected with the bells as those of an organ are with the pipes. The performers on these instruments wear thick leather coverings on the little fingers of each hand, to protect them from the violence of the stroke given. The first and second trebles are played stroke given. The first and second trebles are played with the hands, and the bass with the feet on the pedal keys. Carillon is also the name given to small keyed instruments made to imitate a peal of hand-bells, the tones of which are produced by box hammers striking iron bars of different lengths. Handel used to accompany his air in Milton's "Allegro," "Or let the merry bells ring round," on this instrument.

CARISA, kår-is-sa, in Bot., a gen. of plants belonging to the nat. ord. Apocynacea. The species C. Carandas bears an edible fruit, which is eaten in the East Indies, either alone or with meat, as a substitute for red-currant jelly. The fruits of C. edulis and tomentosa red-current jelly. The frui

OARLINA, kar-li'-na (after the emperor Charlemagne, whose army was cured of the plague by it), in Bot., a gen, of plants belonging to the nat. ord. Composita, and closely allied to the Thistles. C. causits, the Carline thistle, grows on hills and mountains, especially in calcarcous soils, in the middle latitudes of Europe. It was formerly in high repute for the medicinal virtues of its root, which, in large doses, acts as a drastic purgative; but its use is now confined to veterinary practice.

CARLOVINGIANS, kardovin-je-sins, the name of the second dynasty of the Frankish kings which reigned

in France between the years 752 and 987.

CARLUDOVICA, kar-lu-dov'-e-kā (in honour of Charles IV. and Louisa of Spain), in Bot., a gen. of plants of the pat. ord. Pandanuceæ. The unexpanded leaves of C. palmata furnish the material employed in the manufecture of Panama bats.

CARMAGNOLE, kar'-man-yole, the name of a song and dance that originated and became very popular in the time of the first French revolution. It appeared first in the south of France, and is supposed to have re-ceived its name from the town of Carmagoola, in Picd-

noblemen, who were to set as a body-guard to the king in battle.

in battle.

Carmeters, or White Friers, or The Ceners of Our Lady of Mount Carmet, kar mel-ties, a religious order forging one of the four tribes of Mendicants or Beggin; Friers, and deriving both their name and their origin from Mount Carmel. They claim the prophet Bligh as the parent and founder of their community,—an assumption which gave rise to a warm contest between them and the Jesuits about the end of the 17th contern. The order was founded in the 12th the 17th century. The order was founded in the 12th century, by one Berthold, a Calabrian, who came to the Holy Land, and formed a community of hermits on Mount Carmel, at the traditional abode of Elijah. The order afterwards obtained the sanction of the Church, order afterwards obtained the sanction of the Cancon, and a rule from Albert, patriarch of Jerusalem, enjoining poverty, manual labour, living in separate cells, specified prayers, and fastings and silence at certain times. Pressed by the Saracens, they withdrew from Mount Carmel about 1238, and soon spread over Europe, especially Italy, France, Spain, and England. They held their first European general chapter at the monastery of Aylesford, in England, 1245. They had afterwards about forty houses in England and Wales. In 1247 they obtained certain modifications of their rule from Innocent IV., which contributed much to their popularity; and still more so did the adoption of the scapulary, consisting of two stripes of grey cloth, worn one upon the breast and the other upon the back, and fastened together on the shoulders. It was an invention of 1287, and a brotherhood of Scapulary arose, composed of laymen without any monastic vows. The scapulary was revealed by the Virgin, who was said sespinary was revenied by the virgin, who was said to visit purgatory every Saturday, to save all who had at any time borne it, or had died in it. In the 16th century, St. Theresa, a Spanish lady of noble family, undertook the difficult task of reforming this order, which had lost much of its primitive sanctity. with much opposition from the members of the order: but being assisted by Johannes de Santa Crusa, she but being assisted by Johannes de Santa Crusa, she succeeded in dividing the order into two branches:—

1. The Carmetites of the Ancient Observance, or the moderate party, who continued to adhere to their milder rule of discipline; and 2, those of the Strict Observance, or the Bure-footed Carmetites, who went bare-footed, and adopted a much more severe and self-denying course of discipline. There are now four independent bodies or congregations of Carmetites:—

1. Carmetites of the milder rule; 2. Carmetites of Mantus; 3. Bare-footed Carmetites of Spain; and 4. Bare-footed Carmetites of Italy, or of St. Elias, There is also an order of Carmetite nons, which was instituted in France in 1452, and at present are very instituted in France in 1452, and at present are very numerous in Italy.

CAUMEN, kar men (Gr. chairo, I rejoice), a term used among the Latins to signify in a general sense a verse. In a more peculiar sense, they employed it to denote a spell, charm, form of expiation, &c., couched in few words, and placed in a mystic order, on which its efficacy depended. These were generally in verse; but it was also applied to laws, precepts, prayers, and all solemn formula comprised in few words, and arranged in a certain order, though written in prose.

CARMINATURS, kar-min'-i-ins (Lat. carmen, scharm; Fr. carminatif), in Med., is a term applied to certain substances which have the power of dispelling flatuelence, or relieving pain in the stomach and bowels. They belong chiefly to the vegetable kingdom; as, cardamoms, peppermint, ginger, and other aromatic victoriaties.

CARMINE, kar'-mine (Fr. carmin), is the colouring matter of the Coccus cacti, or cochineal insect, and consists of carminic acid united with alumina or oxide of esized its name from the town of Carmagnola, in Piedmont. It was commonly sung and danced at popular further than the success of the preparation of carmine, but festivals, executions, and outbreaks of popular further than the success of the preparation of carmine, but the success of the preparation of carmine and ca

#### Cerminic Acid

CARMINIC ACID, ker-min'.tk.—Mr. Warren De la Rus finds that the colouring matter of cochineal is an acid body, capable of uniting with bases to form: coloured salts and precipitates. He progress it by treating the powdered insect with ethel, to remove the fat, and digesting the insoluble portion in water, decists of lead is precipitated. This must be well washed, decomposed by sulphuretted hydrogen, and the filtered solution evaporated in xuono over sulphuric acid. The colouring matter thus obtained is carminic acid. It is a purple-brown friable mass, soluble in alcohol and water, and alightly emetic. It dissolves unchanged in sulphuric and hydrocolloric scids, but nitric soid decomposes it. Chlorine, iodine, and bromine change its colour to yellow, and the freed alkalies colour the aqueous solution purple. With alum no colour the aqueous solution purple. With alum no precipitate occurs until ammonia is added, when it falls down as a brilliant crimson-lake. The alkaline rans gown as a priment crimson-lage. The significant earths give purple precipitates, and with salts of tin a bright crimson solution is obtained. It resists a temperature of 276.8° (136° C.); but is charred when heated more strongly. Carminic said is a feeble noid. The composition of the substance dried at 248° (120° C.) is represented by C<sub>25</sub>H<sub>14</sub>O<sub>16</sub>.—Ref. Fownes's Chemistry, edited by H. Bence Jones and Professor Hof.

CARMATION. (See DIANTHUS.)
CARWELIAN, kar-ne'-li-ān (Fr. cornaline), in Min.,
a term originally applied to a flesh-coloured calcedony, but now applied to blood-red, yellow, white, brown, and nearly black varieties of this mineral. They consist principally of silics coloured by oxide of iron. This word is frequently written and pronounced corrections. nelian. The finest carnelians are found in Arabia, India, Surinam, and Siberia.

CARNIVAL, kur-ni-rdl (Lat. caro, flesh; vale, fare-well,—i.e. farewell to flesh), the name of a festival observed in Roman Catholic countries, particularly in Italy, immediately before the commencement of Lent, Italy, immediately before the commencement of Lient, beginning on the feast of the Epiphany, or Twelfthday, and ending on Ash-Wednesday. It doubtless arose from the Saturnatia of the ancient Romans, which were orlebrated annually, in the month of December, with all kinds of mirth and freedom, in honour of the golden age, when Saturn governed the world, and when liberty, equality, and happiness prevailed. The Christianized Romans were in this, as in other cases leath to least their pages fastivals, and the Church cases, loath to lose their pagan festivals, and the Church granted her sanction to what she could not very well prevent. The early Christians, it is said, on these days, gave themselves up to voluntary madness, put on masks, exchanged seros, clothed themselves like spectres, and considered all kinds of pleasures allow-able. The rich commenced their festive period at the feast of the Epiphany, or on Three Kings' day; while feast of the Epiphany, or on Three Kings' day; while the middle classes confined themselves to the week immediately preceding Ash-Wednesday, and the poorer classes to the three or four days before Lent. During the last days of the carnival, all kinds of nummery are practised, and freedom of every sort abounds. Home and Venice are now the cities where the carnival is celebrated with the greatest effect; but even in them it is rapidly declining. In Rome the public festivities are confined to the Corso (which is nabout a mile long, but very narrow) and the street ad-joining, and extends over the eight days immediately preceding Ash-Wednesday. The balconies of the houses are crowded with numerous gaily-dressed spectators, and hung with brilliantly-coloured pieces of cotton or silk; while innumerable streamers of the same hues flutter in the breeze. The street below is thronged with carriages filled with gay parties; while crowds of pedes-trians mingle with the vehicles, masked, clad in every variety of costume that fancy can suggest, and playing every imaginable kind of prank. One and all, in the street or on the balconies, engage heartily in pelting each other with flowers, bonbons, and confetti (i.e., small pellets of lime about the size of a pea). Among suan posets or ime about the size of a pea). Among the most usual masks are punchinellos, with enormous noses and protuberant backs and stomachs; harlequins in particoloured vestments, with gwords of last; and pastelones, indulging their usual propensity for thiering by susteining bouquets from the bands of those in the ameliance of the contract of is particoloured vestments, with swords of lath; and pantaioons, indulging their usual propensity for thiering by seatching bouquets from the bands of those in the passing carriages. The festivities do not last the cach side of the neck. It is so balled from the Greek

# Carotid Artery

entire day, but only from about 3 to 5 o'clock, and are each day succeeded by a race by spirited prime without riders. In the evening the windows are illuminated, and the maskers go about with tapers in their hands, every one striving to preserve his own taper and extinguish those of others.

CARRIVORA, kar-nin'-owa (Lat. care, fiesh; core; fierd), a term amplied to all creatures which field

devour), a term applied to all creatures which feed upon flesh. It is definitely applied to that order of the upon ness. It is dennitely applied to that order of the mammalis which preys upon other animals. The forms of this order are very varied. They are furnished with three sorts of teeth, and have nails or claws upon the feet like man and the quadrumans; but they differ from these two orders in not having the thumbs of the satethese two orders in nor naving the tummps of the anter-rior extremity capable of being opposed to the other fingers. The modifications of the molar teeth generally indicate the kind of animal food eaten by carnivors. Some are made for cutting or lacerating, some are serrated, and others are totally or partially tubercu-lated: in the latter case vegetables form a greater or lace reproved to the dist. It all cases the laws of less proportion of the diet. In all cases the jaws of carnivora only open upwards and downwards, and never horizontally. The brain of these animals is ounsiderable in bulk, well marked, but without a third lobe, and does not cover the cerebellum. Of all the senses smelling seems to be in the highest perfection; and as their food does not require much elaboration and digessmelling seems to be in the highest perfection; and astheir food does not require much elaboration and digestion, their intestines are comparatively short. Cuvier
divides the carnivora into four tribes:—1. The Plantigrades, which are distinguished by applying the whole
sole of the foot, especially the hinder one, to the
ground in walking. The bear and badger are instances.

2. The Digitigrades, which have long flexible bodies
and short legs. The ferret and polecat, and the fox, are
instances of the two subdivisions of this tribe. 3. TheFelide, or cats, in which the destructive power is most
highly developed. They are distinguished by the shortround muzzle, the shortened powerful jaw, and the retractile claws, sheathed by means of elastic ligaments,
when the animal is in repose. All the Felides have two
false molars above and two below; the upper flashcutter has three lobes and a blunt heel within; the
lover one has no heel, but has two pointed and entting lobes. They have also one small tuberculated
molar above, without any corresponding molar below.
The tiger is an example of this tribe. 4. The Amphibia;
of which the seal is an example. Many remains of
mammiferous carnivors have been discovered in bone
cayens and osseous breecia. caverns and osseous breccia,

Caro, kd'-ro, a Latin word signifying flesh. It is frequently used in medicine, as well as many of its compounds; as, carnew columna, the fleshy columns or muscular fasciculi within the cavities of the heart; muscular lasciculi within the cavities of the heart; carneus, fleshy, applied to some mucles of the heart; carneus (dim.), a small fleshy substance; carnifornis, having the appearance of flesh; carnicorous, flesh-devouring, applied to animals that live on flesh; carnicology, fleshy.

CAROB BEAN. (See CERATONIA.)
CAROL, kdr-ol (Ital. carola, a song of joy), denoted originally a song sung as an accompaniment to dancing, and afterwards applied to a religious song used in relebration of Christmas. Christmas carols were early in use in the Christian church. According to Tertulian, it was customary for them at their feasts to place in the middle such as were able to sing, and call upon them to praise God in a hymn either out of the Scrip-tures, or of their own invention. Religious songs or ballads in celebration of Christmas are still sung in many parts of England.

CAROLINA PINK. (See SPIGRUIA.)
CAROLINE BOOKs, kur-o-line, the name given to four books drawn up by the bishops of France by order of Charlemagne, to refute decisions of the second council of Nice regarding the worship of images.

CAROLITIC COLUMNS, kar-o-lit-it, columns, the shafts of which are decorated with foliage, flowers, and branches, winding round them in a spiral form, or assuming the shape of wreaths and garlands. The Apprentice's Pillar in Rosslyn chapel is a good example of a carolitic column. The derivation or meaning of the term expelitic is presented.

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se to sleep, because, if tied or com passed, I cause the along because, if tied or con-passed, the person becomes connatose, and has the appellance of being salesp. The right carotid arises from the atteria innominate, the left from the acrts. The left is thus rather longer than the right, and is in general somewhat smaller. They ascend backwards and outwards into the neck, and, when opposite the os hyoides, each of them divides into the external and in-ternal carotid arteries; the former proceeding to the face and parts without the cranium, the latter to those within. The external carotid afterwards divides into leag branches; vis., the superior thyroid, lingual, luteral, compital, muscular, pharynges ascendens, posterior occipital, muscular, pharynges ascendens, posterior auris, transverse facial, temporal, and internal maxillary. The internal carotid enters the cranium by a semeshat tortuous course, and afterwards separates into four branches,—the ophthalmic artery, and the enterior, posterior, and central arteries of the brain.

Care, kare (Fr. carpe), (Cyprinus Carpio).—This fish is found in most of the lakes and rivers of Europe, and in many places it is cultivated in ponds with great care, although not to a great extent in this country, which is, doubtless, owing to the abundance of salt-water fish. It is said that this fish was introduced into England about the beginning of the 16th century, and it has always been greatly estcemed as a delicate article of food. The carp usually feeds on worms and various insects: this diet, however, in places where this fish is bred, is intermixed with grain, &c. The length of a carp's life is annaing. A century would



seem be about the average; but a healthy fish fish will occasion. ally live to the years, or thereabouts. When it is considered that it is an extraordinarily prolific fish, and that its roe has been known to

turn the scale against the remainder of the carp out of warn the scale against the remanner of the carp out or which it has been taken, it is, perhapa, fortunate that it is so generally popular a diet. The carp usually mea-sures about fifteen inches in length; in warm climates, however, it sometimes nearly reaches three fect. The general colour of the carp is yellowish-olive; the head is large, and the mouth is provided with two beards, one aborter than the other; the scales are large and very distinct.

Very distinct.

Capper, kar'-pel (Gr. karpos, fruit), in Bot., a modified leaf, forming the whole or part of the pistil. When several carpels are present, they may be either distinct from each other, as in the columbine, or combined so as to form one body, as in the poppy. The carpels, taken collectively, constitute the Gynacium, or female

rasen consecurery, constitute the trynactum, or female systems of flowering plants. (See Pisrt.).

\*\*OARPENTER BER, kar'-pen-ter (Xylocopa),—This species belongs to the Apida, or true boss. Its name is derived from the singular manner in which its nest is built. This is generally found in soft decaying wood, and is lined with leaves of a semicircular form cut from plants. It is also known as the Leaf-cutting Bee and It is found in all parts of the world. Upholsterer Bee.

CARPENTER'S RULE, a flat wooden rod used by carpenters for the purpose of measuring work and taking dimensions. It is commonly two feet in length, made of two pieces of boxwood joined by a brass hinge, and divided by means of lines perpendicular to the length of the rule, to show the number of inches, half-inches,

of the rule, to show the number of inches, half-inches, fourths, eighths, and sixteenths of an inch in the entire length. Some rules are graduated in such a way as to sid in calculating the solid content of timber.

Oarraway, kar-pen-tre (Fr. charpenterie), the art of preparing and putting together pieces of timber for building and other purposes. The expression carpentry, strictly speaking, is more particularly applicable to the system of framing pieces of timber together to form the partitions, roofs, and floors of buildings, the trusses and frames of wooden bridges, and the centring er supports on which large arches and the arches of

Dridges are built; as well as the keel, ribs, timbers, and planks forming the built of a ressel, which will be treated under the head SERTEVILDIES, (See SERTEVILEINE.) Although the term carpenter is applied indiscriminately to all who make articles of any kind from wood, yet & must be remembered that rough work requiring great strength and durability in method of construction and materials is put together by the carpenter properly so called, while the interior fittings of a house, such as the stairs, skirting-boards, flooring, doors, windows, &c., requiring greater finish and neatness in execution, are the work of the joiner (see JOINEEY); and pieces of household furniture, particularly those made of the more valuable kinds of wood, come from the hands of the cabinetnaker. The wood, come from the hands of the cabinetmaker. The carpenter should be well acquainted with the proper-ties of different kinds of timber (see Woop), and have a knowledge of the strength and durability of each sort, its capability of bearing great tension and com-pression, and the nower it pressure of maintains the pression, and the power it possesses of resisting the action of various causes that bring about the decay of woodwork. (See MATERIALS, STRENGTH OF.) When a tree is felled for building or other purposes, the trunk is stripped of its bark, and it is left to lie exposed to the nir or the action of waters until it is "generated." trunk is stripped of its bark, and it is left to se expossed to the air or the action of water until it is "seasoned," that is, until it has become hard dry wood, free from sap. At least no wood should be used until it has attained this condition; for many of the discomforts of modern houses arise from the green state of the timber that has been worked up in their construction; and the draughts that come through ill-fitting windowframes, shrunken doors and skirting-boards, and the gaping chinks between the boards of the flooring, are to be principally attributed to the same cause. Unless the timber is thoroughly seasoned, it is also liable to the action of the weather, swelling and fitting far too tightly under the influence of a damp atmosphere, and shrinking, splitting, and warping under the heat of the summer sun. Trunks of trees sent from foreign countries are roughly squared to economize space in the holds of the timber-vessels that bring them to our coast; and in this state they are called "baks." Semetimes they are sawn up and brought over in pieces varying in thickness from 24 to 4 inches. When these pieces are only 7 inches in width, they are called "battens;" if wider, "deals." When the timber is brought in balks, it is sawn up as required into beams or planks by saws hendled by two men in sawpits, or by the action of a circular or band-saw, worked by machinery. (See Saw, Sawmill.) The tools used by a carpenter in the exercise of his art are various. For dividing pieces of wood he has the hand-saw, with a long, thin, elastic blade, every alternate too h of which is turned slightly outwards in contrary directions, and the panel-saw, a smaller tool of similar de-scription. For making incisions in wood to any required depth, the tenon-saw is used,—a small fine blade, with sharp teeth, set in a piece of metal running along the back, to stiffen it and prevent it from bend aing. For cutting out circular pieces, or holes of ary kind, such as keyholes, the keyhole or turning-saw is used, consisting of a narrow stiff blade, decreasing in breadth and thickness, and the teeth becoming finer by degrees towards the end. Smoothness is given to wood by means of tools called planes. A large plane, called a "jack-plane," is used for rough work, and a smaller sort, called a "smoothing-plane," for giving a linish to the surface. Besides these there is a great variety of planes used for cutting grooves in wood and for fashionized different briefs of monthly and the surface. variety of planes used for cutting grooves in wood and for fashioning different kinds of mouldings, which are now generally purchased by builders ready made by machinery. For cutting holes in timber, technically called "mortises," to receive "tanons" or projections from the ends of other pieces of wood that fit into them, strong narrow chisels are used, which are driven into the timber by a mallet. Other chisels of different widths are used for paring and cutting, and "gouges," which are tools resembling chisels brought into a semi-circular form, are used for hellowing out cavities and cutting holes. These are the principal tools of the curcular form, are used for nestowing out cavities and cutting holes. These are the principal tools of the carpenter, with hammers, gimlets, and brad-awis for boring holes for the passage of nails and screws; centrebits for boring holes of various dismisters, con-sisting of short iron boring-tools that are inserted in a socket at the lower end of a curved handle, with a

## Carnet Enights

broad bose at the other end to receive the pressure of the workman's chest when using the instrument; punches for driving the heads of nails below the surpunches for driving the heads of mails below the surface of the wood; rame for smoothing and fashioning places of wood into shapes, such as the twisted shaft so common in Elizabethan furniture; a square for fitting places together, or cutting wood stright angles; a mitre-board for forming the angles of frames; a level for cutting wood at any required angle; a line for marking timber by rubbing it with chalk or charcoal, which medianes a rough imprint by stretching it tightly marking timber by rubbing it with chaik or charcoal, which produces a rough imprint by stretching it tightly from end to end of the required line, and, pulling it from the surface, allowing it to return and strike it amartly; a straight-edge for ascertaining that the surface and edges of a board are perfectly straight and level; a gauge for drawing lines parallel to the edge of asy piece of wood; a scrow-driver, pincers, spoke-shave, compasses and callipers, and a glue-pot. Scrows and nails of all sorts and sizes are used for fastening misces of wood together. but the best sort of nail scrow pieces of wood together; but the best sort of nail seems to be one invented and patented by Mr. Wigzell, late master of the Government School of Design at Exeter, which combines the properties of the mail and screw, and can be driven with the hammer, and withdrawn by means of the pincers, without injury to the nail or wood. The methods used in the construction of the woodwork used in buildings for partitions, roofs, stairwoodwork used in buildings for partitions, roots, stair-cases, &c., will be found under their respective headings. (See Partition, Root, Staircase.) Some of the means used to connect and fit separate pieces of timber together will be found under the heading Joiners.

—Ref. Tredgold's Principles of Carpentry; Nicholson's

Architectural Dictionary.

CARPET KNIGHTS, kur' pet, a term sometimes applied to civilians, or persons of peaceable professions, who, on account of birth, meritorious service, or the like, are raised to the dignity of knighthood. They were are raised to the tigarty of kinglatiood. They were so called because they usually received their honours in the court, kneeling on a carpet, and were thus distinguished from knights created in the camp or on the field of battle.

CARPET MANUFACTURE. (See MANUFACTURE OF

CARPROLOGIA, kar-fo-lo'-je-a (Gr. karphos, the nam of clothes, and lego, I pluck), is the picking of the bedclothes sometimes observed in persons in the de-lirium of a fever, and regarded as a very dangerous symptom.

symptom.

CARPINUS, kar-pi'-nus (Celtic car, wood, pinda, head, the wood being used for the yokes of cattle), in Bot., a gen. of plants belonging to the nat. ord. Corp. Lases, which also includes the oaks, the hazels, the beeches, and the chestnuts. C. betulus, the hornbeam, and C. americanus, yield excellent timber, largely employed for agricultural implements and the cogs of will schools. mill-wheels.

CARPOCHATIANS, kar-po-krai'-shuns, a sect of here carpochartans, kar-po-krau-main, a rece of heat-lies, who sprang up in the 2nd century, and were mend after their founder, Carpocrates, an Alexan-drian. Their doctrines were those of the Gnostics, believing in one supreme original being, from whom all existence has emanated, and to whom it strives to return. The system seems to have been founded in great measure upon the Platonic philosophy, especially the "Phadrus;" and it also beers a close affinity to Buddhism. The finite spirits who rule over the several portions of the earth, they hold, seek to counteract this universal tendency to unity, and from their influence, laws, and arrangements, proceeds all that checks, disturbs, or limits this desire to return into the Supreme Being. The souls of men, imprisoned in corporeal bodies, can only escape by rising above the desires of nature through contemplation. Christ they regarded nature through contemplation. Christ they regarded meraly as a man who had risen to the highest flight of contemplation, and had thus set himself free from the laws of the spirits of this world. Plato, Aristotle, Bocrates, and others, who have risen above the religion of their time, they regarded in the same light, and paid them, also, divine honours. This sect was much press aream, also, cavine monours. This sect was much given to the art of magio, and are said to have been most immoral in their practice, holding a community of wive, and not only sanctioning but inculcating single one of the means of rising superior to the spirits of the means of rising superior to the spirits of is world. This sect, though small, continued to exist down to the 6th century.

# Carriers

Carrus, har-pas (Gr. horpes), is a term in high supplied to the wrist, or that part of the applied sta-tremity between the forearm and the hand. The darpal bones, or bones of the wrist, are eight in num-ber, and are arranged in two rows.— a superior and inferior, each containing four bones. In the superior row, counting from without inwards, are the superior or navioular, the lunar, cuneiform or pyramids, and pisiform bones; and in the inferior, the trapesiums and trapezoid bones, the os magnum, and the inmiform bone.

CARREL OF QUARREL BOLT, kar-rel, the arrow made in cross-bows; a cross-bow. CARRIER PIGEON. (See PIGEON.)

CARREER Figure. (See Propose.)

CARREER, kar-re-ure (Weish cariour; Tr. sharrier, to carry).—Persons carrying goods for hirs,
as masters and owners of ships, hoymen, lightermen, carmen, coachmen, railway companies, and the
like, come under the denomination of commen carriers.
The liabilities and privileges of carriers are treated
of under BALMENT and LIEN. In addition to what will be found under those titles, it may be stated that a common carrier for hire by land or water is answerable, by the custom of the realm, for every less or injury to the goods conveyed, unless occasioned by the act of God or the queen's enemies; and, on the other hand, is bound to receive and convey the goods of every applicant who is ready to pay the price of carriage, provided he has room for them, and his liability is capable of being varied by a special contract (if any should happen to be made) relative to the terms on which goods are to be carried on any particular occasion. Accordingly, it was competent to him at common law, by a public notice of the terms on which he deals (as by a notice that he will not be liable for goods beyond a certain value, unless booked as such; and paid for at a higher rate), to limit the measure of the responsibility; for upon proof, direct or presumptive, that such notice came to the knowledge of the customer before the goods were sent, the law would suppose a special contract between the parties conformable to the terms of the notice, though it still held the carrier responsible for negligence or wilful misconduct; and such is still the state of the law with respect to carriers for hire by water. (See 8 & 9 Vict. c. 42, enabling canal companies to become common carriers.) But, as to those by land, it is now provided by 11 Geo.
IV. & 1 Will. IV. c. 98, that no public notice shall limit
or in anywise affect their liability at common law for or in anywise affect their liability at common law for any goods in respect whereof they may not be entitled to the benefit of that act (sec. 4). On the other hand, however, the same statute (reciting that by reason of the practice of sending money, bills, notes, jewellery, and other articles of great value in a small compass, the responsibility of carriers by land for hire had been greatly increased) enacts for their benefit that no such carrier shall be liable for loss or injury to certain enumerated articles of the general description men-tioned in the recital (when the aggregate value shall exceed £10), unless, at the time of delivery to the carrier, the value and nature shall have been declared, and such increased charge paid thereon as by a legible notice affixed in the office shall have been previously advertised to the public; but if no such notice shall have been affixed, or if the carrier shall refuse (when required) to give a receipt acknowledging the parcel to be insured, he is not to be entitled to the benefit of the act, and remains liable as at common law (sees. 1, 2, 3). It has been held, however, that where the carrier has complied with the act, and the customer has not, the former is not liable to the latter even for gross negligence. It is also provided that nothing in the act contained shall affect any express special contract between the carrier and customer, or protect the carrier in any case from loss arising from the felopious acts of any servant in his employ, or protect any such servant from liability for loss occasioned by his own servant from liability for loss occasioned by his own personal neglect or misconduct (sees. 6, 8). In the oparticular case of a conveyance by sea, it is to be observed that the liability of the shipowner (though he is, in point of law, a common carrier, if the ship be ordinarily hired to carry goods) does not sanally rest on the common-law role, but on the special contract created between the parties by the bill of lading; and that a bill of lading; and that a bill of lading, in its most ordinary form, con-

0 2

# Carronades

Carthamia

tains an exception of the act of God, the act of the queen's enounce, fire, and all perils of the seas. By various acts of partitions at, also, shipowners are ex-empted from Barrity for losses arrains from any act recommend to permanent, sans, ampowers are ex-empted from unblitty for losses arising from my act done without their fault or privity beyond the value of the sinp and freight; and are, moreover, protected from those which occur by the breaking out of a fire on board the vessel. (See Ballurat, Bill or Lading,

CARROTADES, kin-ros.cids, short cast-iron guns, arting a changer to receive the powder similar to a mortar, and attached to the carriage by a bolt, which are through a large iron eye or loop underneath the patiest shrough a large ron eye or loop undernesse use that, instead of working on trunnions, as large pieces of ordinance generally do. They derive their name from the Carron foundry, near Falkirk, where this kind of casnon was first cast. As their range is limited in citient, the carronades were more particularly useful in sea fights when the contending vessels came to close quarters, or in breaching ramparts when they were placed pretty near the face of the work; but at short distances they threw shot and shell as effectively as larger guns, and they had this advantage, that they were much lighter, and could be handled by fewer men than long pieces of the same calibre. In consequence of the improvements that have lately taken place in gunvery, carronades are now but little used.

CARROT. (See DAVCUR.)

(CARROTSAI, kin-row-zill (Ital. carrosello, dim. of carro, a chariot), is, properly, a course or contest of chariots and horses, but generally applied to a magnificent entertainment given by princes or other great personages on occasions of public rejoicing, and consisting in a cavalcade of persons richly dressed and equipped, after the manner of ancient cavaliers, who met in some public place to practise jousts, tourna-ments, and the like. Carrousals took the place of the earlier tournaments, and were common in all the courts of Europe down to the 18th century.

CARRUCATE, kard-ra-kuit (Lat. carrucata), in the ancient laws of England, denoted a plough of land, or as much as one team could plough in a year. The ns much as one team could plough in a year. The contents of a carrucate are very variously stated, and indeed, it seems to have varied at different times and in different parts. In the Domesday survey, the hide and carrucate appear to be the same. In the early part of the reign of Richard I., the carrucate is said to have been activated at 60 areas for the same. have been estimated at 60 acres, and to have been afterwards fixed at 100. In the time of Edward I., it appears to have been more than once estimated at 199 acres; and in the 23rd of Edward III., a carrueste of land in Burcester contained 112 acres, and in Middleton 150.

CLRTE BLEFORE, kart blaunsh (Fr., white card), is paper containing nothing but the signature and, it may be, the seal of the party who grants it, in order that the party receiving it may fill it up or insert such conditions is it as he pleases. Generally, the term is used to express unlimited authority delegated by one person to another to set as he may think best. Thus, a representative is said to have received carte blanche from his sovereign if he has unlimited power to deal with those to whom he is accredited.

CARTEL, kar'-tel (Fr. cartel; Sp. cartello), a term a terms, kar-ter (fr. carret; sp. carretto), a term applied to an agreement between two states that are at war, for an exchange of priseners. It is also a challenge to fight a duel. Ships that are used to convey exchanged prisoners, or to take messages from one hostile power to another, are called cartel ships, or by the French bdsiments parliamentaires. To such ships one

the Franch bettiments parliamentaires. To such ships one gius only is allowed for the purpose of making signals.
Cartesian Frincosorar, kar-te-se-din, is that system of philosophy which owes its origin to Descartes (1596—1850), who is entitled the father of modern philosophy. He endeavoured to constitute philosophy a demonstrable science, founded on the principles of pure ranjonalism, and was to philosophy on the continuent whee Bacon was to it in England. Unable to find any firm ground in any of the prevailing systems, distracted by doubtf, mistrusting the evidences of his senses or the conclusions of his understanding, he determined to reconstruct his knowledge, to believe nothing but upon the shearest evidence of reason, and to examine the remines of every conclusion. He pushed his sceptions of six that he came to doubt everything but his iciem so far that he came to doubt everything but his 452

own existence. It appeared to him that doubts might own existence. It appeared to him that doubte might reasonably be enfortained about everything but his own cristence; to doubt the existence of that which thinks and doubts, appeared to him to be an abstractly. Setting out, herefore, from his well-known postulation. Copita, sayo sum (I think, therefore I am), he resolved to admit nothing which could not be deduced from it by a chain of logical reasoning. He did not attempt, as some philosophers have held, to prove his own existence in this way; he merely regarded it as the valvining about which there could not possibly be any doubt. His next step was to lay down certain rules for the detection of truth. These were 1—1. Never to accept anything as true but what is so evidently, so accept anything as true but what is so evidently, so that there can be no reason to doubt it. 2. To divide every question into as many separate questions as pos-sible, that, each part being more easily conceived, the whole may be more intelligible. 3. To conduct the examination with order, beginning with the most sim-ple, and rising by little and little to the most samplex; and 4. to make such exact calculations, and such cir cumspections as to be certain that nothing essential has been omitted. Consciousness being the ground of all certainty, everything of which we are clearly and distinctly conscious, must be true, and everything which we clearly and distinctly conceive, exists, if the idea of it involves existence. The method of ressoning lees of it involves elistonee. An interest was, in his view, the mathematical. "Those long chains of reasoning," he says, "all simple and easy, which geometers use to arrive at their most difficult demonstrations, suggested to me that all things which came within human knowledge, must follow each other in a similar chain; and that, provided we abstain from admitting anything as true which is not so, and that we always preserve in them the order necessary to deduce on from the other, there can be mone so remote to which we cannot finally attain, nor so obscure but that we may discover them." To prove the existence of God was the first application of his method. This conscious-ness of mine is finite and imperfect; but influity and perfection are involved in these ideas, and innate perfection are involved in these ideas, and innate in the mind; therefore an infinite and perfect being must exist. The fundamental attribute of matter is extension, of mind is thought. The soul, whose nature consists in thought, is simple in its essence, or, in other words, purely immaterial, but intimately connected with the body. The pineni gland he supposed may be its seat. From the immateriality of the soul he deduced its immortality; but lest he should be obliged to extend the same recognise to where minute. In recognition, the same recognise to where minutes he recognised the same recognise to where minutes he recognised. to extend the same properties to other animals, he pronounced them to be living machines. The soul is free because it thinks itself so, and in this very freedom consists its liability to error. He made a distinction between sists its insulity to error. He made a unsumption between the passive impressions and active decisions of the soul. He constituted three classes of ideas: advantitious, or those which we naturally acquire; those which we create; and innute, or those which are born with us. He accounts for the communion existing between soul and body by his doctrine of Assistance,—the assistance or co-operation of deity. Notwithstanding the many defects of the Cartesian philosophy, its confusion in some parts and contradictions in others, and a want of conclusiveness in many of its inferences, it swakened men to independent thought, and impelled them to inrestigate the fundamental principles of philosophy.—

Ref. "Enfield"s, Lewes's, and Tenneman's Ristories of Philosophy; D. Stewart's Dissortation on the Progress of Philosophy.

CARTHAMIN, kur'-thil-min, the red dystar principle of the safflower, or Carthamus timeterius. It is obtained by digesting safflower in weak social safe to remove the yellow dysatuff. The washed dye is digested in a solution of carbonate of sods, and a skelar of sotton is placed in the liquid, and lemon-juice or static said is added. The colouring matter is removed by the sotton, from which it is washed, redissolved in carbonate of sodu, and reprecipitated with citric acid. When dry, carthamin is a red pulverniest substance, metallic green when viewed in the mass, but purplish-red when seen in thin layers. Safflower was formerly much used as a dy, partionistly in the form of pink asserts, for dyeing silk stockings; but its ingitireness is a great objection to its use. Selliower is largely used in the

manufacture of rouge for the tollet.

Discussion, Low-thiness (from the Arab, quorious, o paint), in Mor., a gen. of plants belonging to the at. and. Compacter. The most important apacies is in the contract the sufficient, or hansed earlier. The sects of this yield a posteriful plak dye, and are constitutes used to electronists hay suffice. The submested called sales suffice consists of sufficers and undiage. The fruits minimously called seeds yield, a repression, a useful oil, which is known in India as some only.

in oil

count out. Insurance, for the sides, a religious order unded by one Brano, a very learned man and properly ability of a philosophy in Peris, about 1080. They are so that from the desert of Chartreuse, near Grenoble, place of their first institution, and are remarkable the austerity of their rules. The members cannot or the austerity of their rules for the statemy of their rules. The memoria camericars their cells not speak to any one without the permission of their superior. Their beds are of straw, with a covering of felt or course cloth. They wear listinglish shirts, white cassooks, and over these black chasts. In their refectory they are to keep their eyes on the mest, their hands on the table, their attention on the reader, and their heart fixed on God They are not allowed animal food, must fast every Friday, except a annul allowance of bread and water, and observe an almost perpetual silence. When allowed to discourse, they are to do so modestly, not m a whisper, ner yet in a loud or contentious manner They con-less to the prior every Saturday The convents of this The convents of this order are generally very beautiful, that of Napics, though small, is most magnificent, and richly ornamented. The Carthusians first settled in Lingland in 1130, and had monasteries in various parts of the country. There was one estal hand in I indoi where the Charterhouse (a corruption of the original term) how stands

CARTILAGE, ker'-ti let (Lat cartilago), in Anat, is a white, firm, elastic substance, intermediate between bone and ligament, and commonly known by the name of gradie Cartilages are divided by anatomists into— 1, articular or obducent, covering the surface of the bones, which form movable joints, 2 inter articular, which are situated between the ends of bones forming artifulations; and 3 connecting curtilage, which unites one bone with another. In some cives, cartilage oc cars unconnected with hone, as in the larynx and tra-ches. In early life, cartilage in various parts occupies the place of bone, and becomes afterwards cashied The physical properties of cartilage—its firmness, clasticity, and powers of resistance—render it specially litted for the purposes which it serves, facilitating the

notions of bones or connect ng them together CARTILAGINOUS FIRMES, Lar-to by 4-nus, are fishes the skeletons of which are destrute of bony fibre In some cases they would almost appear to form the con-meeting link between the vertebrate and invertebrate animals. The skeleton of the lancelets, for example, is merely fudimentary, it simply consists of a slight transparent flexible dorsal column. The dorsal column transparent flexible dorsal column. The dorsal column of the lamprey also presents a similar appearance. The captire of the backbone of the sturgect is a column of sartlinge, and the vertebrae of sharks consist of hollow cones, which have their cups filled up with the remains of a gelatinous cord. Great fleationty is the result of this arrangement. In many of the more laighly organized cartilaginous fishes, several vertebrae are joined together in one piece, and the shall is formed without sutures, although the shape corresponds with that of other fishes. Cuvier placed cartilaginous flakes with the batrachian restiles in his class 4 months of the same control of the same cartilaginous flakes with the batrachian restiles in his class 4 months of the same cartilaginous capacity. shes with the batrachian reptiles in his class Amphibia Naturalets are now, however, unanimous in placing them in the class of fishes. The heterocercal tail is ruem in the class of manes. The neterocercal tail is one of the most remarkable characteristics of all classes of this had of fish. The vertebral column is prolonged into the upper portion of the caudal fin, and the lower out is given off beneath. Similar tails are to be ob-served in the fossil fishes of the Ol I Red Sandstone

ttion of the Soriga and the d n, however, of factors may be excided by per," which is now m may extent a drawing paper drawing-papes," which as now mange gar, as contanuous sheet of greet width and a length. After the paper is bireconed, it primed, partnenistry if the cartoon is in distemper colours; but this present with it is to be merely a sketch in characteristic with it is to be merely a sketch in characteristic with in the man article when a serious distributed in. the cartoons which were exhibited in Westmuster, some of which may a Hampton Court. The drawing is the canvas or plaster in fresor-pantage at PAINTING) either by rubbing the back of with black chalk or charcoal, and tracing with a hard point, or by puncturing the out which the work is to be executed may be a chalk If, however, the painter designs chalk If, however, the painter desires to a the original cartoon, he stretches threads and drawing, so as to divide the surface into a squares of the same size, and draws king, an squares of the same size, and draws kind, according to display to carbon to their, to display as a similar number of corresponding agencies. Carbon are indispensable for partitions in frence, as there only be executed in small portions at a base, which plaster on which the painting is made seement before cartoons by Annibale Carracter may be at the National Gallery, but the finest in the way those by Riffaelle, which are carefully preserved in the carracter may be at the carefully preserved that again the carefully preserved that the carefully preserved that the carefully preserved the carefully preserved that the carefully preserved the carefully preser remain out of the original set of twenty-five which were executed for Leo X about 1616, as danger for I wo sets were made at the tape tapestry at Arras, one of which is now at Bome and th in the museum at Berlin Raffaelle's exquisits of in the muscum at Derini . Laurents a exquisitating were thrown a sude as soon as the tapestry-me esses and the greater part were lost or destroyed, seven that remain were purchased by Eubent Charles I, to be copied at the tapestry-world Mortlake After the death of this monarch, were bought for the nation, by order of Casas Charles II afterwards sent them to Mortial Charles II afterwards sent them to Mortisles, where an attempt was made to produce the designs in tapestry, and there the drawings were much injured and defaced. They were, however, restoned and mounted on canvas by a paniter of the mans of Henry Cooke, by command of William III., who built a gallery for their reception at Hampton Court, siter a design by Sir Christopher Wren. They were zemoved to Buckingham Palace and Windoor Castle in the reign of George III., but they were subsequently restored to the gallery at Hampton Court, in 1814, where they still remain. where they still remain

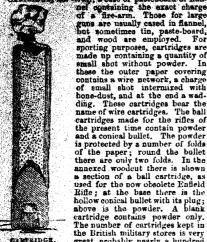
where they still remain Cartoce, kar toosh' (Fr cortonese), in Mil., the name sometimes given to the box or case in which sol-diers carry their cartridges The word is not so much diers carry their cartridges. The word is not so much used in this country as in France, but the leathern case in which the cartridges are carried is called pouch In former times the external case was filled by a block of wood, the sides of which were boned full of holes to receive cartridges. When the earthidges in one side were exhausted, the soldier was object to turn the block to get at those in the next sade, a pro-ceeding which was attended with inconvenients in the heat of action Cartridges are now extract in a tan case, which fits into the outer one of leather. The name was also form rly given to a wooden but containing a number of bullets and balls, which were used as grape and canister are now, for Brieg into a close body of men on the deck of a versel, or advanting to carry a breach by assault.

period.

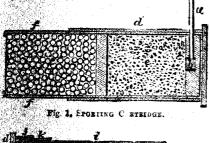
Clurcom, kar-toon' (Lat. carta, paper, Ital cartons, pasteboard), in Pant, a drawing on a large scale, crearily of the full size, executed as a preliminary of the middlion that supports the corona of a cornice security of the full size, executed as a more in oil-colours ar freeco, from which the work itself is afterwards according to the full size of the f

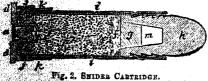
# Cartridge

are out in what is called onco-rilicoo the mathod of the ground of the car e of the stone blic figures that appear it corrouche is level with it relief on th of the column round which seen hellowed out.



great, probably nearly a hundred millions. At the present time the best sporting gues are made upon the breach-loading principle. The cartridge for these weapons is necessarily of different formation to that of the muzzle-loading cartridge. There are three chief varieties of breech-loading earlings. In the Universal Cartridge the percussioncap, the gunpowder, and the shot are packed in a plain paper covering. In the second variety—the Royal Cartridge—the envelope is formed of a light





## Carving

stown at c. Fig. 2 shows the section of the finider Cartridge: a, a brass cylinder containing cap: b, capphate; c, paper bed; d, from plate; e, p labricator; g, plag; a, builet; d, case; g, of breas foil; k, copper case; k, caperent; lubricator in bullet.

bullet.
CARCERDGE PAPER is a strongly-manufacture by this name, having he which is called by this name, having to the first instance, for soldiers unstained surface causes it to be extensively used architects, and engineers for their drawing three kinds of this paper,—Common Carriers, and Double Rugineers Cartridge, and Double Rugineers Cartridge, and Double Rugineers Cartridge, and Double Rugineers Cartridge, and Double Rugineers.

ginally found there), in Bot, a gen. of plants ing to the nat. ord. Umbellifera. The species is the common caraway, a native of most Burope. It is largely cultivated in Essex for a commonly called seeds, which have a pleasant odour and a warm aromatic taste, owing to the presence of about five per cent, of volatile oil. They are much used in confectionery and for flavouring cakes. The oil, obtained by distilling the fruits with water, is

on, obtained by distance the fruits wash water, as used as a corrective adjunct in medicine.

Caruncia, kar'-un-k! (Lat. caruncula, dim. of caro, flesh), in Anat, is used to denote a small place of flesh, or a little fleshy excrescence; hence the caruncula lachymalis, a small fleshy glandiform body, situated on the inner angle of each eye.

Stuated on the inner angle of each eye.

CARUS, kill-rax (Gr. kara, the head), in Med., denotes profound sleep, or lethargy (which see).

CARUING, karl-ring (Sax. cearfun, to carre), a term more particularly applied to the production of figures.

fruit, flowers, and ornamental work, from pieces of wood or vivery, by cutting the same into the desired shape by means of chisels, gouges, saws, and files of the necessary forms. The art of carving is called "sculpture" when stone is the material employed, and "chasing" when the work is executed in metal. The ancient sculptors of Greece, and those of Byzantium in later times, excelled in carving in ivery; and magnificent cups, crucilizes, and other works of ore, were produced in this material in Italy and the Low Countries between 1200 and 1600. The Hindoos and Countries between 1200 and 1600. The Hindoos, and Chinese are famous for their delicate and chabrate carriog in irory to this day. Magnificent specimens of wood-carving are to be found in the majority of eathedrals and churches in the Gothic style of architecture erected during the aniddle ages in England and on the Continent; while Windsor Castle, Hampton Court, St. Paul's Cathedral, and many of the residences of the nchiltre are enriched with work produced by of the nobility, are enriched with work produced by the chisel of Crinling Gibbons, a carver of considerable the cliner of extining chooses, a carrer of consideraous repute, who excelled in the production of fruit and flowers, and flourished between 1670 and 1721. This art has been revived to a great extent in the present day; and some beautiful carrying in wood may be seen at the New Palace at Westmanster, mostly executed at the New Falace at Westmanster, mostsy execution by machinery contrived for the purpose, as well as at St. Michael's Church, Cornhill, and the chapel of Jesus College, Cambridge. The Swiss are extremely ingenious in carving animals in acit wood; apprited ingenious in carving animals in soft wood, sparase affigures being produced by comparatively few strokes of the tools employed. A very effective imitation of carving in oak and dark wood is made in gutta-percha and leather, which is softened and present in modifials prepared for the purpose. The Keuliwork sideboard, and one known as Stevens's sideboard, made by Mr. John Stevens, of Taunton, the former of which was shown at the Exhibition of 1851, and the latter in that 1862 may he outed as affording good aneximens of of 1862, may be cited as affording good specimens of modern artistic skill in carving in wood. Within the last twenty years the application of machinery to the carving of wood has been brought to some degree of perfection. A pattern of the work to be carved in in wire network. In the third kind—the Green Cartidge, which is the strongest of all, the eavelope is formed of a stronger wire network. The annexed figure shows a longitudinal section of one of the many kinds of breech-loading cartridges for sporting or stort gues. A is a brass pin, which, on being struck by the banders of the gun, is driven down upon the percussion—cap (b), whereby the gaupowder (c) is exploded, and the shot (f) propulled from the gun. The cart of the work can only be executed by the machine and the first instance, prepared by the machine upon seature of stance. The work can only be executed by the machine a cat of forwardness, after which the machine to a tate of forwardness, after which it must be finished by hind. In 1848, Mr. Pratt invented a cartridge is closed up to a being struck the principle of the interest of the gave to the Institute of British Architects. His machine combined the purious production, and the cartridge is closed up by a brass capsule,

following description from the displate Oydepastic.—
"The material in which the design is to be carred in fired on a table, which turns on a source. The table, acting in the manner of a contrabit, is attached to an arm, also working on a centre, and is made to recover with great valouity. Guided by a pattern of cest iron, the tool, by a double movement of the arm and the table, can be made to pass through any combinations of curves, drilling out the material as it passes over it. The lines of the design are determined by the iron pattern, and the depth and form of the sinking by the shape and position of the tool; and if a double moulding is required, two patterns and two tools, and a double operation, are necessary. The tool and its position at the end of the arm being once adapted to the section of the moulding to be produced, the rest purely mechanical. The tool revolves three thousand times a minute, and the wood is cut away in the form times winne, and the wood is cut away in the form of very fine fragments, like aswdnet, laving a smooth surface behind it." The best-contrived and most extensively used carving-machine is that invented and patented by Mr. Jordan in 1845. This machine has patented by Mr. Jordan in 1840. This macnine has since that date been constantly employed in carving the desorations for the interior of the Houses of Parliament. Mr. T. B. Jordan, the engineer, in describing his invention in Uro's Dictionary of Arts, Managinotures, and Mines, thus prefaces his explanation of the working of his machine:—"Its principle of action and its construction are widely different from that above described (Mr. Irving's), and is is capable of copying any carved design which can be produced, so far as that is possible by revolving tools; the smoothness of surface and sharpness of finish is neither possible nor desirable, because a keen edge, guided by a practised hand, will not only produce a better finish, but it will accomplish this part of the work at less cost. The only object is sing machinery is to lessen the cost of products or to save time; and in approaching towards the time of a piece of carring, there is a time when full a progress of the work on the machine would be more appears to that the ball it by hand. This arises from the necessity of assing smaller tools towards the finish of the work, to prenetrate into its sharp recesses, and the necessarily tion and its construction are widely different from that penetrate into its sharp recesses, and the necessarily now rate at which these cut away the material; it is consequently a matter of commercial speculation how far it is desirable to finish on the machine, and when but it into the hands of the artist, so as to se-bure the greatest economy. This depends in a great measure upon the hardness of the material;—rosewood, chony, box, ivory, and statuary marble should be wrought very nearly to a finish; but lime, deal, and other soft woods should only be roughly pointed." The exrangements of Mr. Jordan's improved machine, the details of which are delineated at figs. 1, 2, 3, on Plates XXVII, and XXVIII., may now be described:— Fig. 1 is a plan, fig. 2 a front elevation, fig. 3 a side elevation. The same letters of reference are used to denote the same parts in every drawing—A B C D is a cast-tron frame, forming the bed of the machine; the upper portion of the sides A B and C D is planed perfectly straight, emouth, and parallel, and they serve as a railway for the wheels (E, F, G, H) to run ou. These wheels are mounted between centres, which are fixed to the frame I J K L, and are so adjusted us to insure the steady motion of the frame in a horias to insure the steady motion of the frame in a horizontal plane, and in the direction of the lower rails only. If N O P is the floating-table, or chuck, of the machine, to which the work and patterns are attached; and it is furnished with wheels, which roll on the upper edges of the frame I J K L, the like procaution of nice adjustment being observed. It will readily be seen that this arrangement gives the workman the morning the work about in

from 5,000 to 7,000 revolutions of the cutters per minute; Q R is the treadle, which is managed by the workman's fact, and seepes to raise and depress the cutter; its connection with the horizontal bar cerry-ing the pulleys (13 and 14) is this shown in the draw-ings. The weights (5, 8) are a counterpoise to that of the side and parts connected with 5, which say the cased at pleasure, according to the number of manthe slide and parts connected with it, which are his varied at pleasure, seconding to the number of man-drils in use; 15 is a ston-acrew, which vegulates the range of the slide to which it is fixed, so that is mannot turn in its bearings. It peases through a free hole is the bracket (16), which serves as a stop to the looking nuts (17 and 18), and these may be fixed on any part of the acrew, so as to determine the distance through which the slide shall move. In very large much is requisite to introduce some mechanical arrange for giving the workmen more command over the ments of the floating-table; and I find that sh obvious that several modifications of the rest and pinion, or the screw, may be used with nearly the same The arrangement shown in the drawings of effect. The attrangement snown is the unavings con-sists of the steering-wheel (U) and its axis, which passes across the centre of the lower rolling-frame, and is furnished with a drum of three or four inches diameter, about which is coiled the centre position of the wire line V V, while its ends are fixed to were the (W, W), which pass through sockets case on the feat-ing-table; and consequently turning the steering wheel to the right or left will give a corresponding motion to to the right or left will give a corresponding motion to the work just inside the steering-wheel; and on the same axis there is a small cogged wheel (X), which serves to fix the axle, and, consequently, to stop the motion from right to left, whenever the detent (Y) is dropped into its cogs. In some cases, as where the floating-table and work are very heavy, it may be desirable to move the table by the steam power, as in the following manner:—Z Z is an endless band passing over pulleys fixed to the bed of the machine, to which allow motion is communicated from the float motion is communicated from the float machine. a slow motion is communicated from the first mover at a a; it passes through the jaws of a clamp (b), which is so arranged as to allow both sides of the hand to pass freely when the handle of it is in a central position, and to clamp the frame to the right or left portion of the band when in either of those positions. Of course the result of this is, that when the left portion is clamped, motion is given to the work in that direction in which it is travelling, and the opposite direction is obtained by reversing the clamp; but the band itself always travels in the same direction. The this facility of the clamp is the clamp in the clamp is the clamp. always travels in the same direction. Fig. 4 is a front elevation of a part of the machine, with the additions requisite for cutting on the round, with a side plevation of the headstocks and turning-plate, &c. A. B repre-sent headstocks, which are fixed to the floating table for the purpose of supporting the work between centres, in order that it may be carved on every side: several pairs of these may be fixed on the table at one time, dependent on the number of pieces it is intended to cut. The mandril of A is provided with a wheel (C) having a screw cut in its edge suited to the edge of the screw d, which, when in use, is placed across one and of the floating-table in the bearings e, e, and is edjusted to gear with the wheels of all the front headstocks in use; the back headstocks (b) are fixed to the table exactly opposite the front ones, and are used for supporting the other ends of the pieces of work and pat-tern. When the table is thus fitted with its headstocks and work, supported between centres, any motion given to the wheel M, which is the head of the large screw, will move all the pieces of the work through screw, will move all the pieces of the work through a centre angle, and present another face of it to the cutters; and if this turning of the screw is continued from the screw is continued. seen that this arrangement gives the workman the power of moving the work about in every possible direction in a horizontal plane. Other details in the construction of this part will be better understood after the whole irreuniference would eventually be careed. At D there is a cogged wheel fixed on the strew d, with a feet the supports for the vertical slide and other parts connected with the cutting and tracing apparatus; 6, 6 is the slide; and 7, 8 s bar cast on the slide, which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which has a T groove through its whole length, and to which the headstooks for the mandrils (9, 10, 11) are the headstooks for the mandrils (9, 10, 11) are largely a supports of the whole in the given in an appear of the new portion presented at each turn, of course the whole circumference would eventually be cavered. At D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the strew d. D there is a cogged wheel fixed on the str from time to time, and the cutter made to operate on

place of F, and the wheel G stay he charged in like meaner. This lest wheel is fixed to the tame axis as the draw E, having its beneing in a sociat cast on the core frame: a third this, diens is called the castne core frame: a third this, diens is called the castne core frame: a third this, diens is called the castne core in a wife could the cast of which are lated to the footing-table in each of the band of an existing to a cast-ipon plate which is used between the centres for fixing busts, resulted, and other characters tubicets which require a which is used between the centres for fixing busts, resulted, and other characters tubicets which require a winds of the band of the centre of P on the major by this to resert all the parts O P O is the here, and other elaborate subjects which require a style of motions in order that the cutter and tracer to state to zero. All the parts OPQ is the of the plate; S is the centre, which works on the tracer to the plate; as shown at S i, in the nde elevation of the centre is the centre in the other end of plate, to work on that of the back headstock, B is passe, to work on that of the back headstock, it is an or carrier, which fits into a bole in the face-age of the front headstock, T U is the chuck for the table in the plate, it is furnished with a spill turning in structs in the plate, with cogs in its circumference, that the detent V may fix it in any required pos-tions. When the work and pattern are mounted in this when the work and pattern are mounted in this way, the workman can move it to say angle about the axis BW, and also to any angle about the axes X, Y, and, somequently can bring the cutters perpendicular for every side of it except that by which it is fixed to the search. Of course a number of these turningto every dide of it except the starting places may be used at one time, as already explained in other cases; and when the checks are moved, each must be moved through the same angle. The mode of using this machine is as follows — Let us suppose that an original carring has been produced by hand, of which a number of copies are required. If the same subject is to be often repeated, it will be found expedient to get a metal cast of the original carring for the pattern. This is fixed to the floating-table of the machine under the trace, as shown at define. expedient to get a metal cast of the original carring for the pattern. This is fixed to the floating-table of this machine under the trace, as shown at d e f s. figs. 1 and 3. On each side are fixed pieces of wood or other maternal of the proper size to carve the subject out of, as at h i j k, and the number of these patterns which can be executed simultaneously is only limited by the relative size of the work and of the machine. In the drawings two only are shown. Having fixed the tracer in its socket, and adjusted the enuters (m, m) so that they are over the centre lanes of the blank pieces,—when the tracer is over the section like of the pattern,—and brought the points of these to the same level, the machine is ready to be set in motion. When the cutters are at full speed, they must be brought into action by withdrawing the matters of the foot from the treadle, and thus allow the autters to come down, which will immediately out the authors to come down, which will immediately cut away some superfluous part of the material, and then by gradually moving the table about by hand, and, keeping the tracer constantly floating over the wife the tracer constantly floating over the is diamediately produced on as many pieces as may have been put down for the purpose Some of the leading forms of the cutters are shown at figs 6, 7, 8, 8, 10, Fiste XXVII The outline of the figures is the forms of the tracer, and the dotted lines show that of commerce, the kernels of which are desicious. An irrad of the tracer, and the dotted lines show that of the ecoresponding cutters. Spirals of any pitch may be obtained by using the change wheele F, G, fig. 4, Plate LAYALL, are gear with the hand K, the cross motion of the table from right to left being stopped by dropling the detent Y into the cogs of the wheel X as be table from right to left being stopped by dropling the detent Y into the cogs of the wheel X as the table from right to left being stopped by dropling the detent Y into the cogs of the wheel X as the table from right to left being stopped by dropling the detent Y into the cogs of the wheel X as the table from right to left being stopped by dropling the detent Y into the cogs of the wheel X as the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to the cogs of the wheel X as the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the table from right to left being stopped by dropling the required section of the groom state, with stems swollen at the joinings, and opposite the part of the principal state of the subject of the table from right to the cops of the wild specific to the subject to the subject to the table from the subject to the s where at the extress point is a dotten lines show that of the corresponding cutters Spirals of any pitch may be extended by using the change wheels F, G, fig. 4, Plate EXYEM, in gear with the hand K, the cross motion of the table from right to left being stopped by drop-ping the detent Y into the cogs of the wheel X. As where viscos of wood or other materials as are in. pang the detent Y into the cogs of the wheel X. As these y shoes of wood or other materials as are instended to be ent at one time are roughed out as if for terming, and fixed between the centres on the table, so as to be parallel to each other and to the bed rails, and was the centre line of each piece a cutter suitable for producing the required section of the groove is adjusted on the bar, before described Fig. 5, Plate 3. VIII., shows another modification of the machine for each register pasteries on the surface of a cytinder from EXPAIL, shows shother modification of the machine four carring patterns on the surface of a cylinder from a first guide or drawing. The inventor of time valuable forms of carring-machine specially claims the following supervisionable in his invention.—The improvement in the machinery for outting, carring, and engraving, wherean the tracer and cutters are moving simulta-

guide, the tracer, or entirer, more us in the measure described in the In describing the working of his Dist. of Arts, Mongrestums, and n in Ure In describing the working of his interest black of Arts. Mosaylectures, and Miller than concludes :—"In going Marcings, the workings will of course stead; the workings will of course stead; the workings has a favourable position for the test as much as possible on that face, he the chucks through the same number and so on until all has been completed."—"It realist the chuck face, the test of Parist Investors will all the series of the chuck of

and so on until all has been completed. "Eef. Repository of Patent Inventions, vol. vi. (unlarged active).

CANYA, hav 'r-d (Gr. harmon, a hut), in Ret., a gra. of plants belonging to the nat. ord. Jugicipalaces. The species are chiefly natives of North America. C. elbe, the common hotory, is valuable for its thisber, and also for its ethile seeds, which are commands be win as hickory ints C diverforms yields are olive-haped or elliptical nut, which resembles the wainut in instant, and is known as the peccan nut. C. proving yields are diversely and is known as the peccan nut. C. proving yields are diversely in the command of Largent, and is known as the peccan nut. C. proving yields are well and of largent of the command of largent, in Arch., the term given to famile figures clothed in long flowing robes, that are used

flowing robes, that are used instead of columns, to sup-port an entablature, like the male figures called Atlantes (See ATLANTES.) The use of male and female figures to support portices or entablatures was doubtless derived from the Egyptians, and dates from a very early period, but, according to Vitruvius, they received the name they still received the name they still bear to commemorate the cowardness and want of patriotism shown by the people of Caryes, a town of Arrains, when Xerxes invaded Greece For this act they were punished by their fellow countrymen, who eacked their town, and, after killing all the males, reduced the women to a state of slavery, and as the figures called Caryatides appear supporting a heavy burden like slaves this name



GARYATIDES.

was applied to them to keep the slavery of the women of Carye in remembiance

CARRO(AR kur r.o. kar (from Gr koruon, nut), in Rot, a gen of raa ts belonging to the nat, ord Khico-lolaces The species are large trees, natives of its bhottest parts of South America. O butyrossa is much esteemed for its timber, which is used in shipbuilding and for other purposes. The separated portions of the fruit constitute the Sousir or Sawarrow nuts of commerce, the kernels of which are delicious. excellent oil may be extracted from them.

dila Struckium, to which it commu sbundant in Gypsophilo Struthess, to which it commu-nicates well "snarked asponspoons proporties: hence the plant is commonly termed Egyptian scoperoot. Some of the plants have shown flowers, as the species of Disminus, Silene, and Lychnic. From plants of the first of these genera are derived all the beautiful culti-vated varieties of the sweet-william, pink, and carna-

CANOFESTINES, keivi-o-fill-us, in Bot., a gen. of plants belonging to the nat. ord. Myrtacea. The most important epocies is C. aromaticus, the clove-tree, a native of the Moluceas, but now grown also in the lele of France, India, and the West Indias. The cloves of commerce are the unexpanded flower-buds dried. They form a well-known spice, and are much used in medicine on account of their aromatic, stimulant, and carries the aromatic. The dried purpose full aromatic. minative properties. The dried unripe fruits are called Mother cloves, and are used in China and other countries instead of the ordinary cloves, to which they are

very inferior.

CABYOSIS, kai-ri-op'-sis, in Bot., a superior one-scaled, one-scaled indehiscent fruit, with a thin, dry membranous pericarp, completely and inseparably united with the seed. The grains or fruits of the grasses, as wheat, barley, rye, and maize, are ex-

CARTOTA, kā-ro-o'-tā (Gr.), in Bot., a gen. of palms, natives of the Bast Indies. From the species-C. urcus, sugar, or jaggers, is procured, and its juice, when fermented, forms a kind of toddy or palm-wine. From the trunks of the old trees a kind of sago is obtained, and this is much used as food in Assam.

Casa, kai'-sa (Lat., a hut or cottage), was used in the Middle Ages for a convent or church: thus Bede calls Whitchurch Candida casa.

CARCADS, ka-kaid' (Fr.), denotes properly a water-fall, in which the water does not, as in the cataract, fall uninterruptedly from a great height, but in which it is broken at several parts during its sall, or it is a waterfall less than a cataract. It is generally applied to those artificial waterfalls that are met with in pleasure-

grounds and public parks.

Case, knise (Lat. casus, from cado, I fall), in Gram, is that modification which is effected on a noun to denote its relation to the rest of the sentence. commonly denoted by changes in the termination of the noun. The number of cases in the decleasion of nouns varies much in different languages. In Sanscrit there are eight cases; in Latin six; in Greek five. In English there are only three cases,—the nominative, possessive, and objective,—the last occurring only in pronouns. All the other relations of nouns are ex-pressed by prepositions.

CASE, ACTION ON THE, was a form of personal action called trespass on the case, for redress of wrongs and injuries done without force; as, for not performing a promise made by the defendant to the plaintiff, or for speaking words by which the plaintiff was defamed, or for other misdemeanour or deceit. Before the act was sed which rendered it unnecessary to describe the nature of the action in the writ, it was imperative that the declaration should be framed to comply with such description, and many nice distinctions were drawn in cases ranging between this form of action and that of trespass vi et armis (by force actual or constructive). Except to a legal autiquary, it would be practically useless to give an account of the history of this form of action, or to notice the distinctions above referred to; and this

or to notice the distinctions above referred to; and this observation will apply to the other five forms of personal actions, except that of repletin, which is one of very limited application, and different in its general character, and will be treated of in its proper place.

Cass, Pairwas's, a large flat oblong frame, generally about thirty-four inches long, fifteen inches broad, and an inch and a quarter deep. It is used by printers as a receptacle for types, and is divided into numerous compartments, each of which contains a number of treas of the same kind. A pair of cases, as controlly compartments, each of which contains a number of types of the same kind. A pair of cases, as generally used in Engiand, consists of an upper and a lower case, which are placed aslope. The upper case is divided into ninety-eight "boxes," which contain the large and small capitals, the figures and reference marks, and some other letters not frequently used. The lower case has fifty-three "boxes," which contain the smaller letters, spaces, points, &c. The behind, as a thin, clear, straw-coloured liquid. The

arrangement of the boxes in the lower use used different printing offices. The boxes in the upper are of uniform use, and the letters are placed in a betical order, as the comparatively rare use of committees the use of committees the use of the boxes depend upon the letter entained. The letters which occur most frequently in composition of the boxes depend upon the letter entained. I letters which occur most frequently in composition placed in the largest boxes, and in the most convergence of the letter of the letter of the most convergence of the letter of the product of the most convergence of the letter of the product of the most convergence of the letter of the product of the most convergence of the letter of the product of the most convergence of the letter of the product of the most convergence of the letter of the letter, the box containing it is placed in the middle of the case, and is larger than any of the case, and is larger than any of the chiefs. The type, or "letter," contained in a case is sufficient to fill three pages of this work, equal to 27,000 or 22,000 types of this small-sized letter.

CASE-HARDERING, Aurd'-en-ing (Ang.SEK), the process by which a surface or outer costing of

process by which a surface of outer resting of steel is given to iron goods, such as grates, feature, firearms, guu-locks, keys, tools, ac. It renders, any article which has been so treated for more durable than it otherwise would be, and sufficiently hard to resist the action of a common than duration than it otherwise would be, and sufficient hard to resist the action of a common file. It, makes it capable of receiving a high degree of policy when any piece of ironware is to be case-hardened is first made red-hot in a close case, surrounded a charcoal, or the burnt hoofs, akin, or benes of a sainful mixed with put and commitmed with a commitmed with a standard of the sainful mixed with but and commitmed with a sainful mixed with a large commitmed with a sainful mixed with a standard or sainful mixed with a standard or sainful mixed with a sainful mixed with a standard or sainful mixed with a sainfu charcoal, or the burnt hoofs, skin, or some of any animal, mired with salt and sometimes vinegat. It is kept in this state for a greater or less time, according to the size of the article or the thickness of the steel coating required. It is then taken out and cooled is water or oil, and afterwards polished. Sometimes yellow prussiate of potash is used, which is applied to the iron when it is red-hot; after which it is heared again, and then cooled and polished.

Clark water of Clark water when a number of

Case-shot, or Canister, kaise-shot, a number musket-balls inclosed in a metal case or cylinder, wh bursts immediately after leaving the muzzle of the gun, and the bullets radiate outwards, or scatter in all directions, like the pellets in a charge of shot fixed from a fewling piece. It is very destructive to a body of men at 250 or 300 yards' distance. Case shot are made to suit guns of different calibre. These chieffy made to suit guns of different calibre. Those chiefly used in the present day are called "Shrapnel thalls," as they were invented by an officer of the mains of Shrapnel. The case is spherical in form, like a shot or shell, and is filled with bullets and powder. It explodes by means of a fuse, which ignites when the shell is fired, and is so regulated that the case may burst just before reaching the body of men against which it is directed.

CASRINE, kai-seen (Lat. caseus, choose), is the nitro-enous principle of milk, which forms a large portion genous principle of milk, which form, appears to of the curd. Caseine, in the soluble form, appears to be preserved in solution by a small quantity of alkali contained in the milk. In the coagulated form it is readily obtained by adding dilute sulphuric acid to the milk, which precipitates in the form of a curd. The curd is well washed and dissolved in carbonate of soda, curd is well washed and dissolved in carbonate of soda, and allowed to stand for twenty-four knurs, to let the oil rise to the surface. This is skimmed off and the caseine precipitated by an acid. The process is repeated a second time, and the coggalum digeated with alcohol and ether, and dried. With all these precations the caseine still contains some saline matter, which cannot be removed. It is also obtained by coggulating the milk with hydrochloric acid. The curd is washed with dilute hydrochloric acid. The curd coagulating the milk with hydrochloric acid. The surd is washed with dilute hydrochloric acid, and finally with pure water; a guttinous mass is obtained, which is slowly dissolved by digestion at 1107, with a large quantity of water. The solution is filtered, coagulated with carbonate of ammonia, the coagulated with water, ether, and alcohol, and finally dried. Coagulated caseine is readily dissolved by the shalies and alkaline carbonates. Caseine also unites with earthy carbonates, and forms insoluble compounds. A very tenacious lute is made by mixing poor cheese with alaked lime. The most remarkable form of coagulation is that produced by the action of the secretion from the mucous membrane of the stomach. This

#### Casemate

action of rennet in this instance remains unexplained. sction of renact in this asstance remains unexpiance. Caseins has not been found anywhere but in milk. The quantity varies according to the period of lectation at which the milk is examined. Its amount also varies with different animals, as will be seen from the following table :---

Human	female		31 to	35	parts	ip	1,000.
Cow Dog	12	*******	30 to	41	-	,,	
Dog	**	******	80 to	146		,,	
Ass	45.00	ووالووالوالوا	19 to	23			

CARREATH, kais'-mait (Fr.), in Mil., the term applied to a vaulted shell-proof chamber constructed in any work of defence, with embrasures, from which a fire can be kept up on the enemy, the artillerymen employed being protected from the enemy's shot and shell. In some fortresses, case-mated batteries are raised in tiers, one above another. Casemates were at first merely loopholed galleries, will the face of any work from which a fire of the work. built in the face of any work, from which a fire of musketry could be directed, to prevent the enemy from effecting a lodgment in the ditch in front; but in the present day they consist of vaulted chambers made of solid masonry, and as lofty as possible, every care being taken to promote ventilation and carry off the smoke, which, with the deafening reverberation of the roar of the guns, causes no little inconvenience to the officers and men employed therein. Sometimes they are made open towards the rear, or with large massive doors, that can be opened or closed at pleasure. There is generally a hole above each embrasure and a chimney in the top of the vault, which aids in carrying off the smoke when firing is going on. Casemates are also used for the reception of troops and stores during a siege, or as hospitals. For these purposes they must be at least sixteen or eighteen feet wide, and the same in height. Care should also be taken to keep them dry by covering the masonry, forming the vaulted roof with cement, and making drains to carry off the rain that may fall on the earth and turl above the roof.

CASEMENT, kais'-ment (Ital. casamento), a window which opens on hinges fixed to the side of the window-Casement windows are common in old houses, the frames which support the glazing which is set in grooved bands of lead, being made of iron. They are much used in the domestic Gothic architecture, but are more liable to admit draughts than the sash windows, and however pretty their appearance may be from without, they are inconvenient within, as the heavy wooden frames and transoms of the entire window serve to keep out the light and hide the view. The name is also given to a broad and deep circular moulding in Gothic architecture, which is sometimes enriched with rosettes placed at intervals, or folinge.

CASSOUS OXIDE. (See LEUCINE.)

OASH, Kaish, in Com., signifies ready money, bills, drafts, bonds, and all readily negotiable paper.

CASE ACCOUNT, in Book-keeping, is an account to which nothing is carried but cash on the one hand, and from which all the cash payments of the concern are drawn on the other. The balance is called the cash in hand. When the balance is in favour of the credit side, the account is said to be in cash; when in favour When the balance is in favour of the credit of the debit side, out of cush.

Of the debit and, out of cash.

Cashew Nut. (See Anagardium.)

Cashew, kash-eer' (Fr. caisser), the cash-keeper; one who is charged with the duties of paying and receiving the debts of a house of business or a society.

The cashier in many cases is called the treasurer.

Cashiers of the Bank are those officers who sign notes, and examine them when returned for payment.

and examine them when returned for payment.

Cashiebing, kish-eer-ing (Fr. caser, to break).—
When an officer of the army or nave is diamissed her
Majesty's service in consequence of scandalous and
infamous conduct, he is said to be cashiered. It is
dismissal attended with deep and indelible disgrace,
and the offender is disqualified from ever re-entering
the service from which he is thus ignominiously expelled.

Casuo, ka-se'-no (Ital., a little house, dim. of casa, a house), is a olub-house or piece for social meetings. It is derived from the Italian, and was first applied to those small pleasure retreats which noblemen in Italy usually have at some distance from their palaces, to which they occasionally retire and enjoy themselves.

Afterwards, the middle clusses united in societies, and formed similar easines or club-houses, for social enjoy-ment. The term is also applied to a building annexed ment. The term is also applied to a continuous actives to or near a theatre, where musical or dancing actives are held, and where there are also conversation and are held, and where there are also conversation and such-like. Cabilliard-rooms, refreshment-rooms, and such-like. sinos are now common in France, Germany, and other parts of the continent, and have also been introduced into England.

Casurt, kds-kct (Fr. casse), a small box or chest for holding jewels or other small articles of value. The term is also applied by scamen to a small rope fastened to little rings upon the yards; it is used in order to fasten the sail to the yard when it is to be furled.

CARQUE, kask (Fr. casque; Lat. cassis, a helmet) CASQUE, KREE (Fr. casque; Lat. cassis, a helmet), a term synonymous with helmet (see HELMET), applied to a defensive covering for the head, made of plates of steel or iron, and surmounted with a plume. It seems, from the derivation, to imply more particularly a helmet similar to those worn by the Greeks and Ronans, which covered the head only, and left the face and neck exposed. and neck exposed.

CASACTION, COURT OF (Fr. cassation, from casser, to annul, quash), is the highest judicial tribunal of France, so called from its having the power to annul the deci-sions of any of the other tribunals. It is not, strictly speaking, a court of appeal, because it does not go into the merits of the cases on which judgment has been given, but only takes up the legal bearings of the case, as to whether the due forms of procedure have been observed, and the judgment be in strict accordance with law. When a judgment is quashed, the case is remitted back to the tribunal appealed from to give a new decision. It is a court of appeal in criminal as well as in civil cases. It consists of forty-eight members, who are appointed by the sovereign, but who hold office for life. It is divided into three sections, vis.—
1. Section des Requées, which decides on the admissibility of the petitions or appeals; 2. Section de Cassaand 3. Section de Cussation criminelle, which decides upon appeals in criminal matters. The court has a president, and there are presidents also of each of the three sections; but the minister of justice, as keeper of the seals, has the right of presiding in cases where it sits on appeals from the cours imperiales. Cases of peculiar difficulty may be judged of by the three sections united; and the whole court, when presided over by the minister of justice, possesses powers not specially provided for by law; as in censuring or suspendcally provided for by law; as in censuring or suspend-ing judges, &c. This court owes its origin to the revo-lution of 1789, and it has been of great benefit to France, maintaining a unity in the legislation, and protecting the people from arbitrary proceedings or misjudgments in the other courts. In all the changes of government and administration, this court has always preserved a high character for strict impar-

CASSAVA. (See MANIHOT.)

Cassia, küsh'-e-ü (from Arab. katsa, to tear off, the bark being stripped from the tree), in Bot., a gen. of plants belonging to the nat. ord. Leguminosa, sub-ord. Casalpiniea. The leaslets of several species furnish Casulpiniea. The leaflets of several species invalue the important drug senns. Some uncertainty prevails as to the species yielding some of the commercial varies as to the species yielding some of the species and all species as a learner in senns. as to the species yielding some of the commercial varieties. That kind commonly known as Alexandrian senna is generally supposed to be derived from C. officinalis, var. lancolata, and C. oborata. This is the kind most esteemed in Britain; but it is frequently adulterated esteemed in Britain; but it is frequently adulterated with the leaves of other plants. The common Restladian, Mecca, or Rombay senna, is supposed by Royle to be the produce of C. officinalis, var. acutifolia; Timevelly seema, a very fine kind, is furnished by C. officinalis, var. clongata. The above three varieties are those generally used in this country, and are officinal in our plarmacoposiss. Other commercial varieties are, Tripoli senna, from C. achievica; Aleppo senna, from C. chorata; and American senna, from C. maritandica. Another drug, called cassis pulp, or purging cassis, is obtained from a species of this gen.; namely, C. fatials. The pulp is contained in the pods. It is of a reddish-black colour, with a sweetish teste, and possesses lazative and purgative properties. The pods of C. braziliana are used in veterinary medicine under the name of horse-cassis.

#### Cabsis-bark

The bark of C. auriculata is employed for tanning, and the flowers are said to be used for dyeing yellow. The seeds of C. Absus, under the names of Chichou and Ciamatan, are used in Egypt as a remedy in ophthalmia.

CASSIA-BARK, and CASSIA-BUDS. (See CINNAMONUM.) CASSIOPRIA, käs-se-o-pe'-s-ä, in Astron., a constellation in the northern hemisphere, midway between the constellations Auriga and Cygnus. It is not far from the north pole, and may be distinguished by five stars disposed somewhat in the form of the letter M. It contains only one star above the third magnitude, and that is not so brilliant as stars of the second. It is figured as not so formant as stars of the second. It's aggree on the celestial globe as a female figure sitting in a chair with its feet towards the pole. The name is said to be derived from Cassiopeia, the mother of Andromeda, who was made a constellation and placed in this meds, who was made a constellation and placed in this position for having boasted that she was prettier than the daughters of Nereus. Tycho Brahe observed a star of great brilliancy in this constellation in 1572, It is said to have appeared there in 945 and 1264, but this is doubtful; yet if this were the case, Sir John Herschel considers that it may reappear in 1872.

reappear in 1872.

Cassock, khá-sok (Fr. casaque), a kind of surtout or long upper garment, now usually worn only by the clergy, but formerly by all classes. As worn by the English clergy it is black, with a single upright collar; but on certain state occasions bishops sometimes wear purple cassocks. In the Church of Rome they vary in colour with the dignity of the wearer; those of the priests being black, bishops purple, cardinals scarlet, and ponce white.

and popes white.

Cassowary, kisi-so-wā-re (Casuarius), a gen. of large and powerful birds closely allied to the Ostrich. It is an inhabitant of Java and the adjacent Indian archipelago, and is generally called the helmeted cassowary, on account of an osseous crest or horny helmat which surmonnts its head. The skin of the head and the upper part of the neck are without feathers, and of an intense blue and deep red colour. There are also two pendent wattles, partly red and partly blue, on the front of the neck. On the breast is a bare place, on which the bird rests when lying on the ground. In height it is less than the ostrich, standing little more than five and popes white.



CASSOWARY.

feet when erect. It is, however, robustly built, and reet when erect. It is, however, roomsty built, and sery strong. From the appearance of its eyes and the form of its head, the cassowary might be supposed to be of a fierce and threatening nature. This is not the case, as it is rather timorous and shy than otherwise. When attacked, it defends itself by kicking backwards with its feet, and striking with its short and otherwise useless wings. All the feathers of the cassowary are of the same kind, and of the same colour: they are only designed for covering. Its whole plumage is very poorly supplied with feathers, and, at a short distance, it presents the appearance of a rough coat of coarse

#### Casto

cept the ostrich, is becoming very rare in its native regions; but there are specimens to be seen in most of

regions; but there are specimens to be seen in most of the menageries of Europe.

Cassythaches, kis'-se-thai'-se-e, in Bot., the Dodder-Laurel family, a small nat, ord, of plants separated from the Lauracea by Lindley. There is only one gen.—Cassytha, which includes nine species, natives of tropical regions, and distinguished from the species of Lauracea by their parasitical habit, by their scaly modified leaves, and by the fruit being inclosed in a succulent calys. Their uses are unknown.

Casse kint (Den Lauracea).—The tearn cast is generally.

Succulent calyx. Their uses are unknown.

Caer, kāt (Dan. katter).—The term cast is gagerally employed to denote a statue, bust, or the resemblance of anything that may be formed by pouring plaster of Paris in a liquid state into a suitable mould. It is also applied to articles of cast-iron and other metals. Impressions or casts are taken from the human-face by inserting paper funnels into the nostrils, and then pouring liquid plaster of Paris over the face, which has been previously greased, to prevent the adherence of the material employed. It rapidly hardens and becomes fit for removal. The cast thus taken forms a mould from which casts of the face may be procured. The process is useful in multiplying copies of works of art executed in marble, architectural details, &c. In angling, the line with the coller and flies attached is called a cast; and we commonly use the expressions called a cast; and we commonly use the expressions "cast in the eye," "cast of countenance," and " oast of hawks," in hawking, when a number are let loose at once.

Once.

CASTANEA, kūš-tai'-ne-d, in Rot., a gen. of plants belonging to the nat. ord. Corplacea. The species are familiarly known as chestnut-trees. C. vulgaris or vesca is the Spanish chestnut, which is much outlivated for timber, and for its edible nuts, which form a principal part of the food of the poor in the south of Europe. C. americana, a native of the Northern States of America. Dodines a much smaller. but very sweet of America, produces a much smaller, but very sweet nut. The chestnuts eaten in Britain are chiefly imported from Spain.

CASTANETS (Sp. castaneta, or castaneta, probably from castaña, a chestnut), a small musical instrument of percussion, much used by the Spaniards and Moors in their dances. It consists of two small round pieces of hard dried wood, or of ivory, hollowed out in the centre, and placed together, with the concavities inwards, and fastened to the thumbs. The fingers being rapidly struck assened to the numbs. In a migra coing raphy serious upon them, a tramulous sound is produced, which marks the measure of the dance. The use of this instrument was probably brought by the Moors from the East into Spain. It is now frequently used in ballets and operas. The cretaion of the ancients was a similar instrument.

CASTE, kast (Port. casta, a breed), in general, is applied to the several classes or orders into which communities are sometimes divided, with hereditary burdens or privileges; more particularly it is applied to that division into classes which prevails in India. The Portuguese, who were the first of European na-tions to establish themselves in India, found there a very strict distinction maintained between the different classes of society, to which they applied the term casts. Hence the term has also come to be applied to such social distinctions among other nations as are made to depend upon birth or fortune. The distinction of castes has existed in society from the very earliest times. In Egypt, Assyria, ancient Persia, and over almost the whole of Asia, it rises beyond the period of history. In Egypt the division into castes existed as early as the time of the Phasacha the principal of as early as the time of the Pharaohs, the principal of as early as the time of the Pharaols, the principal of these being the priests, soldiers, husbandmen, watermen, and herdsmen. In Persia, even before the time of Zoroaster, the people were divided into four castes; viz., priests or magi, soldiers, husbandmen, and tradesmen. It is highly probable that these divisions were originally founded upon differences of descent, and originally lounded upon differences of descent, said that the separate cases were at first separate races of people. Among the Hindoos society is divided into four castes:—1. The Brahmins, or priests; 2. the Cohatrys, or military class; 3. the Vaisys, or mercantile; and 4 the Sudra, or service class. The Brahmins or exported to have precaded originally directly with the property of the property as presents the appearance of a rouga coas of coarse cantile; and 4 the Sudra, or service class. The break hair. It feeds upon eggs, fruit, and succulent herbage.

The eggs of the cassowary are greenish in colour, and have a much thinner shell than those of the ostrich.

This peculiar bird, which is the largest known exflicing, and assisting others to sacrifice. The most

exalted of men, even kings themselves, are infinitely inferior to the meanest of Brahmins. The least disrespect shown to one of the secred order is the most atractions of armes. Neither the body nor property of a Brahmin can be touched, even though guilty of the worst of crimes. "What men desirous of life would be to the control of the worst of crimes." injure those by the aid of whom worlds and gods perpetually subsist?" The Cahatryas, or military caste, sprang from the arm of Brahms, and, though looked down upon by the Brahmins, they are looked up to by the other castes with a veneration only inferior to that paid to the Brahmins. It is said that the saver-dotal order cannot do without the military, nor the military without the sacerdotal, the prosperity of the one depending upon the other. It is the duty of the Oslattra to defend the people, to give alms, to sear-files, to read the Veda, and to shun the allurements of sensual gratification. The Vaisya, the agricultural or sensual grantication. The Vanya, the agricultural or newcantile class, sprang from the thigh of Brahma, and their duty is to keep cattle, to cultivate land, earry on trade, lend money at interest, sacrifice, bestow gifts, and read the Veda. The Sudra, or service class, proceeded from the foot of Brahma; and a chief part of their duty is to serve the other castes. The most abject and grovelling submission is imposed upon them as a religious duty, and enforced by the most cruel punishments. No Sudra must amass wealth, and a Brahmin may seize, without hesitation, the property of his slave. Neither are they allowed to read any of of his slave. Nother are they allowed to read any of the sacred books, nor to be instructed in the principles of religion. Besides these four castes, there exist in India a large class of persons called Pariahs or Chandalas, who are regarded as the outcasts of society, objects of contempt and diaguat, with whom no one of caste can hold any intercourse. The loss of caste is one of the most serious calamities that can befall a Hindoo. This, however, results not from immoralities, for the most abandoned Brahmin retains his rank, notwithstanding his crimes; but he will entirely forfeit it, and lose all countenance in society, by touching inpure food, or some such petty delinquency. Mix-ture of castes, though not absolutely forbidden, involves disadvantages upon the offspring. The different castes have become so much intermixed, that the pure races can scarcely be said to exist in the present day, except among the Brahmins; and, from the state of society, distinct employments can now no longer be maintained. A Brahmin who cannot find employment in his own line may descend to the exercise of military duties, or tillage, or traffic. A Cshatrya and a Vaisya may also have recourse to inferior employments without loss of caste. The Indian armies are now not confined to one, but are recruited from all castes of the commu-From the intermixture of the races, innumenity. From the intermixture of the races, innume-rable mixed tribes have sprung up, who form castes among themselves.

CASTELLAN, kas-tel'-lan (Lat. castellanus), the go vernor of a castle or the constable of a fortified house. It was also the name of a dignity or office in Poland, the castellans constituting a kind of lieute-nauts of provinces, and commanding a part of a pala-tinate under the palatine. They also formed a lower class of senators of the kingdom, and sat on low seats

ciass of semators of the kingdom, and sat on low seats behind the palatines or great senators.

\*\*Castrination, kis-tel-lai'-shun (Lat. castellatio), in the Middle Ages, denoted the building of a castle, or the fortifying of a house to render it a castle, which, by the ancient laws of England, required the king's attacks. antherity.

CASTIGATION, kus-te-gai'-shun (Lat. castigatio), denotes punishment, correction, or discipline. Among ment inflicted on offenders by beating with a wand or

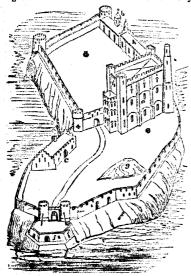
Casting, kast'-ing, a term applied to the process Observed, kest-ing, a term applied to the process of pouring a metal or some other substance, in a fluid or semi-fluid state, into a mould, which is made in various ways, and of substances best suited for the material which is to be poured into it. The fluidity of material which is to be poured into it. The limitity of the substance may be produced by heat, or some other agent; but the cast always solidites in the mould. The process is applied to the manufacture of articles in fron, bronze, bell-metal, lead, steel, copper, porce-lain, plaster, and cement of various kinds. The method of casting cannons in iron and bronze will be found

elsewhere. (See CANNON.) The process adopted in casting statues in plaster, and making ornamental pot-tery and busts in Parian ware, differs materially from that which is used in forming metal castings. process will be found described in the notice of that branch of art to which it respectively belongs. (See PORCELAIN, POTTERY, SCULPTURE.) The process of forming or founding iron castings of great size, and bells and statues in bell-metal and bronze, will be found

described under the head of FOUNDING.

CASTING VOTE, is the vote which is given by the president or chairman of a meeting when the votes on each side are exactly equal; and thus the point at issue is decided by the casting vote. Sometimes the chairman has a casting vote in addition to his vote as an ordinary member; at other times, he has only a casting vote. The speaker of the House of Commons has only a casting vote, and whon, as has sometimes happened, it is necessary to give it, it is generally on that side which will admit of the question being reconsidered.

CASTLE, kus'-l (Lat. castellum, a fort or small camp), the name former), given to a strongly-fortified build-ing inclosed by walls, and intended for a place of residence, calculated to afford protection against the attack of an enemy. The buildings to which this term is applied were chiefly the residences of the nobles during the Middle Ages, and were erected in the reigns of the Norman and Plantagenet kings while the feudal system existed in this country. Castles are said to have been built in many parts of England by the Saxons and Danes, but they were not of the strength and size of the Norman castles. The Romans erected many strongly-fortified camps in various parts of the country, called castella, which were garrisoned by small bodies of troops. These were afterwards used as works of defence by the Saxons, and turned into castles by the Normans by the addition of the massive keep and berbacan, with towers here and there at the angles of the outworks; but with the introduction of the feudal system by William the Conqueror, that monarch and his followers, among whom the country was parcelled out, commenced the building of the castles whose picturesque remains give additional interest to many a beautiful bit of English scenery, and are intimately associated with historical events and legendary lore. The erection of these baronial fortresses was effectively continued in the succeeding reigns, no less than 1,115 having been built in the troublous times that marked the reign of Stephen. The great strength of the castle, and its capability of resistance to the imperfect artillery of the day, consisting of the trebuchet, balista, man-gonel, and other machines, from which stones, darts, and fireballs were hurled at and within the walls, rendered the barons insolent and oppressive, as they could not only defy the forces which a neighbouring baron might lead against them, but even those of the king himself. The unfortunate Saxons and people who were held in thraidom, passing with the land itself from one master to another, were obliged to labour at the will of the baron who owned the district, in the erection of these strongholds, which afterwards be-came the scene of many a deed of violence and wrong; and, indeed, the insolence and lawless conduct of the barons attained such a height, that, in the reign of Henry II., no one was permitted to erect a castle without the permission of the crown; and this was seldom granted without sufficient cause, for the castles had become the retreats of rufflans who menaced the life and property of all around them whenever an op-portunity offered itself. The baronial castle, however, often formed a nucleus for a town, and many a pros-perous and thriving English town and city can trace its rise from the few mean dwellings that a noble's re-tainers erected around and close to the castle of their tainers erected around and close to the castle of their feudal superior for the purpose of mutual security and defence. The principal parts of the Norman castle were the keep or donjon, the courtyard or bailey, as it was sometimes called (see Balley), the walls that surrounded the court, the barbacan or gatehouse (see Barbacan), and the ditch or most. Sometimes an inner court was made within the outer one, immediately cound the learn age, surrounded with walls which round the keep, also surrounded with walls, which served as a second line of defence when the enemy had taken the barbacan and occupied the outer court. Outbuildings were also added to serve as a chapel, stables, and lodgings for soldiers, with a mound between the barbacan and keep, from which it is supposed that the baron dispensed justice to his retainers. The keep was usually a square tower of enormous strength; the walls were from twelve to twenty feet in thickness at the base and about eighter ten feet wide at the top: they were surmounted by battlements. A narrow winding staircase, generally in one of the angles or a projecting turrer, gave access to the first floor, where the entrance to the interior of the castle was situated. The chambers were small, and insufficiently lighted by narrow windows set in smail, and insumerously igneed by narrow windows set in deep embrasures. The walls also contained small chambers and galleries here and there, and staircasses giving access to the battlements. These passages were loop-holed, to admit the light, and for purposes of espial and defence. The keep was generally buttressed, and had defence. circular towers or bastions at the angles, one of which circular towers or deathous at the angies, one of which rose above the rest, to afford a lookout-post for the warder or sentinel on guard. A good example of the old Norman keep will be found in Norwich Castle, and those of Rochester, Conisborough, and Newcastle. Sometimes the keep was built in an angle of the outer sometimes entirely within it; and it was often erected on an artificial mound, like the Dane John at Canterbury, which probably derives its name from having been at some time or other surmounted by a



CASTLE.

keen or donjon. It was divided into four stories, of which the basement was set apart for stores, &c.; and below the basement was generally a dungeon for prisoners. The first floor served the purpose of a common hall, with small withdrawing-rooms or private chambers attached. The second and third floors were divided into apartments for the owner of the castle and his family, and sleeping-chambers for his guests and domestics. The arrangement of castles that were built at a later period, such as Windsor Castle, Kenilworth, and others, was more complicated, and the buildings covered a greater area. Jousts and martial exercises were carried on in the court-yard, the walls of which were strengthened with towers and bastions, furnished with battlements, loopholes, and machicolations. The barbacan formed a fortified entrance to the court-yard, with a portcullis and necessary defences. From this the drawbridge, which afforded the means of passage over the surrounding most, was raised and lowered. The Scottish fortalices and psel-houses, particularly those on the border, were not of the size and strength of the English castles. They consisted chiefly of a square tower with battlements and bartizana (see

BARTIERN): it was surrounded by a most whenever at was possible to do so, and every advantage was tall of its natural position to secure it from attack or s of its latural position to secure it from attack or sur-prise. In the accompanying illustration denicting a Norman castle, and copied from Grose's "Military Antiquities," there are shown:—b, the shapel; t, this stable; d, the inner bailey; s, the outer bailey; f, the barbacan; g, the mount; h, the lodgings of the soldiers. —Ref. English Cyclopedia—Arts and Sciences; Brit-ton's Architectural Antiquities; Bayley's Ancient Custles of England and Males. of England and Wales.

CASTOR, the Beaver. (See BI CASTOR OIL. (See RICINUS.) (Sec BEAVER.)

CASUARINACER, kas-u-ar-in-ai'-se-e, in Bot, the Beefwood fam., a nat. ord. of dicotyledonous plants in the sub-class Monochlamydea. There is but one genus, Casuarina, which includes about thirty-two specie principally natives of Australia. They are very peouliar trees, with slender, wiry, drooping, jointed branches, which have no evident leaves. The name Beefwood was suggested by the colour of the timber resembling that of raw beef. The wood is also known under the names of Botany-bay Oak, Forest Oak, He Oak, and She Oak. It is imported in considerable quantities, and is used in this country for inlaying and marqueterie.

CASUISTRY, kus'-u-ie-tre (Ital. Span. casuista; Fr. casuiste; from Lat. casus, a case), is that branch of ethical science which professes to deal with cases of conscience. It lays down rules or canons directing us how to act in all matters of moral doubt; whether and how far an obligation is binding upon us, or may be relaxed or dissolved, on account of concomitant eix-cumstances. Its rules are drawn from revelation, reason, the canon law, authority of the fathers, &c. This science has been chiefly cultivated by the Roman Catholics, and was much studied in the 15th and 16th Catholics, and was much studied in the 15th and 18th centuries, especially by the Jesuits, being admirably calculated to advance the policy of that order. The confessor, who was able to lay down exact rules of conduct, and to decide which was the greater of two sins, obtained agreat power over his penitent. Indeed, the science has been said to have had its origin "in the distinction between mortal and venial sin," and has not insufficed by the art of quibbling with the distinction between mortal and venial sin," and has not inaptly been termed "the art of quibbling with God." This science, however, has been cultivated in the Protestant as well as the Roman Catholic church, and there was, until recently, a professor of casuistry in the Cambridge university.—Ref. Mayer's Bibliothees of Cassists, where they are arranged under the three heads of Lutheran, Calvinist, and Roman.

Casus Brill, kai'-sus bel'-li (Lat., the cause of war), is the reason assigned by one nation for moint to war

is the reason assigned by one nation for going to war

with another.

CAT, kat (Felis).-It is not a little singular that the origin of the most important member of this family, the domestic cat (Felis domesticus), should be involved in such obscurity. By the older naturalists it was in such obscurity. By the older naturalists it was supposed that it might be considered to be descended from the wild cat (Felis catus-ferus). Modern science from the wild cat (Felis catus-Ferus). Modern science has upset this theory by bringing a tremendous array of argument, and battering at its most vulnerable parts. In its place another theory has been substituted, and accepted generally by naturalists. It is well known that the ancient Egyptians possessed a domestic animal, which, judging from representations of it on the monuments of Thebes and elsewhere, bore recombined to the control of the control emblance to our domestic out. Moreover, in the a resemplance to our domestic oat. Moreover, in the British Museum there is a copy of an Egyptian painting, which is supposed to represent the cat of that country catching birds; and it is conjectured that it was trained for that purpose. This same animal has been referred to as being not unlikely the progenitor of the domestic cat; and the probability of this theory and the probability of this theory are proposed. or the domestic cat; and the probability of this theory has been augmented by the discovery of a species (Felis maniculata) by Rüppel in Nubia. This animal is said to be about the size of the domestic cat, and one-third smaller than the wild cat. Rüppel gave his opinion that it must be a descendant of the domestic cat. opinion that it must be a descendant of the domestic cat of the Egyptians, and that, at some remote period, it was transferred to the Europeans by the contempo-rary Egyptians. This opinion has been adopted by many eminent zoologists, amongst whom may be man-tioned Temminck, and fir William Jardine in our own country; the latter, in particular, has some very inge-

Catacom be

nions remarks thereupon, which may help considerably to elucidate the difficulty connected with the origin of Felis domesticus. There does, indeed, seemmuch in favour reassomesticus. There does, indeed, seemmuch in favour of Rüppel's theory; only, so the other hand, we have naturalists of equally heavy calibre dissenting from it. An authority whose opinion cannot be too highly estimated in all that relates to natural history thus alludes to Felis musiculata — "This species, to which the big authority of Rüppel has assigned the origin of our house-cat, is still further removed from it in essential colorised absenters then some the Rivitis wild at the zoological character than even the British wild cat, to which it has been previously so generally referred; and that, as in the case of so many of our domesticated animals, we have yet to seek for the true original of this useful, gentle, and elegant animal."—(Bell, History of British Quadrupeds.) Dallas also makes a similar statement in his "Animal Kingdom." Mr. Bell not only denies the correctness of Ruppel's theory, but deals a death-blow to Sir William Jardine's and other naturalists' notion of the crossing of the wild and tame cat. "It is not without much reflection on the matter," says he, "that I have come to the con-clusion that this opinion of their intermixture, repeated and transmitted from one to another till it has become an uncontested dogma, is erroneous, and has its foun-dation in mistaken facts." This emphatic declaration from so eminent a zoologist is a little startling; but, with all deference, we must still incline to the opinion that the intermixture of the two breeds is far from improthe mermixing of the two breeds is lat from impro-bable. It would seem that the subject of the origin of domesticated animals is fraught with considerable difficulty. It has engaged the attention of numerous zoological societies for some years, and but little pro-gress has been made. The wild cat is found in all the wooded districts of Europe,—in Germany, Russia, and Hungary: it is also found in the north of Asia and Mepaul. In Great Britain it was at one time abundant, and met with in all the woods and forests. From a charter granted to the abbot of Peterborough, in the reign of Richard II., we learn that the wild cat was one of the animals hunted in those days. Its hide was probably not very highly valued; Archbishop Corbyl's canons (1127) ordained that the nuns and abbesses should not wear a more expensive apparel than that made of wild cats or lambs' skins. At the present time, the number of wild cats inhabiting England is not very large, and they are principally found in the northern counties. In Ireland, and more particularly in the north of Scotland, they are still found in large numbers. Pennant's description of the wild cat is very smusing, although perhaps more applicable to the animal of his time than our own. "The wild cat," says he, "may be called the British tiger; it is the flercest and most destructive beast we have, making dreadful havoe among our poultry, lambs, and kids. It inhabits the most mountainous and woody parts of these islands, living mostly in trees, and feeding only by night. It multiplies as fast as our common cats; and often the femsles of the latter will quit their do-mestic mates to seek the forest home of the wild spemesse mates to seek the torest nome of the win spe-cies." The domestic cat is so well known that any description of it would be unnecessary. In the town and the country, in the mansion of the rich and the cottage of the poor, in the workshop of the artisan and the offices of the merchant, this well-known animal may be commonly found. It is of many colours and sizes: there is the black cat, the tabby, the tortoiseshell, the white, the slate-coloured, the blue or Chartrense, the dun-coloured cat, and a few others, the most beautiful the slate coloured. tiful of which, perhaps, is that known as the Angora cat, with its long silky hair. As a domestic animal it is greatly prized, and its services are extremely valuable; but as a companion of man it does not rank very highly. It displays very little of that affection, nsy, absolute devotedness, so characteristic of the dog. It is more attached to locality than to its owner; and there are numerous instances on record of its deserting a family in whose service it has been living for years, on their removal from a residence in which it has been on their removal from a residence in which it has been brought up, and to which it will return, even though it be under the rule of strangers. Perhaps one of the most admirable qualities of the cat is its extreme devotion to its young; for their sake it will brave the greatest danger, and its uneasiness at finding them removed, only for a few minutes, is familiar to all. The

numerous anecdotes of its maternal care alone would fill a volume. The extraordinary artifices it will resort to to secure its young are astounding, and seem simost human in their character. The period of gestation is sixty-three days, the young remaining blind nine days after birth.

CAT, in Mar., is a term used in various ways, according to the words with which it is joined. Its principal significations are the following:—Cat-fall, a rope used to heave up the anchor from the water's edge to the bow. Cat-harpings, small ropes for bracing the shroads to the lower masts behind their respective yards. Cathads, two strong short beams of timber projecting over a ship's bows on each side of her bowsprit. Catblock, a two or three-fold block, used to draw the nuchor up to the cat-head by means of an iron hook, called the Cat-hook, which is fastened round it. Cat-o-wine-tails, an instrument composed of nine thongs of line or rope, about half a yard in length, having on each three knots tied at regular distances; to this a

piece of very thick rope is joined as a handle.

CATABAPTISTS, kūt-ā-bāp'-tiste (Gr. kuta, sgainst, and baptiso, I baptize), is applied to presons opposed to baptism, regarding it either as a rite altogether obsolete, or as applicable only to converts from another addition.

religion to Christianity.

CATACHRESIS, kùt-ü-kre'-sis (Gr., abuse, from kata, against, and chroomai, I use), is applied to a figure in rhetoric in which an improper in place of a proper term is used. It occurs when, for want of a proper word to express a thought, one is added which comes near to it; as when it is said of the Greeks,—

## "They build a horse by Pallas' art divine."

It is frequently used by poets for novelty, or to give additional force to the expression, when the proper word is not strong enough; as when Milton, in describing the descent of Raphael from heaven, says that he—

# "Sails between worlds and worlds."

CATACOMBS, katt-u-komes (Gr. kata, in the sense of "below," and kumbos, a hole or hollow), vaults below the surface of the earth, used as burial-places for the dead. There are many of these subterranean excava-tions, in the form of long galleries and chambers, in many parts of Europe. They are to be found at Syracuse and Palermo, in Sicily, and in Asia Minor, Syria, Egypt, Persia, and Greece: some have also been discovered in South America. The catacombs of Rome. Naples, and Paris are the most famous ; they are cut out of a soft calcareous rock that is easily quarried. The catacombs of Rome are on the Via Appia, or Appian Way, not far from the city; they are said to extend for twenty miles underground; but they cannot now be explored for more than one-fourth of that distance, and many parts have fallen in, which causes a visit to them to be attended with some danger. It would also be hazardous in the extreme to visit the catacombs without a guide, or to become separated from the party with whom one may be traversing these gloomy vaults and galleries, which wind about in all directions, and cross each other like the turnings of a labyrinth. The passages are about eight feet in height and five in width; the graves are hollowed out of the sides, forming three tiers one above another. When the body had been deposited in the cavity assigned to it, it was walled up, and an inscription, generally con-fined to D. M. (Deo Maximo), with a few brief particulars with reference to the name, age, and calling of the occupant of the cell, was cut on the stones that formed the closure of the tomb. At intervals there are large vaulted chambers, which form a centre in which many of the passages meet, and which appear to have been used as places of worship. They are furnished with altars, and are ornamented with fresco-paintings, inscriptions, sculptured crosses, and crucifixes. Some of these chambers, or chapels, are said to have been formed by order of some of the popes of Rome. The carly Christians used the catacombs as places of wor-ship and cemeteries for their dead; but it is most pro-bable that they were excavated and used for this purpose prior to the Christian ers. The catacombs at Naples are similar in construction to those at Rome, and were used by the early Christians for the same purposes. They are adorned with fresco-paintings of

#### Catafaloue

great freshness of appearance, among which the palm-tree is conspicuous as an emblem of Palestine. The galleries of the Nespolitan catacombs are wider than those of the catacombs at Rome. Those at Palermo and Syracuse are characterized by greater regularity of construction, and are filled with the tombs of heathens and Saracens as well as of Christians. The catacombs of Egypt are inferior to those of Italy in size; many of them were explored by Belzoni, who brought from thence the sarcophagus of Psammetichus the Powerful, who flourished about 650 s.c., made of alabaster, and most beautifully sculptured. Catacombs of considerable extent were discovered about a hundred years since in the hill of Tarchino, about three miles from Corneto, in Italy, the site of Tarquini, one of the twelve republics or representative cities of the ancient Rituria. They are remarkable for the beauty of the decorations, paintings, friezes, mosaics, vases, arms, and other archieological remains that have been dis-They are remarkable for the beauty of the covered in them. The catacombs of Paris extend under the city for a considerable distance; they were formerly quarries, from which the stone that was used in build ing the old city was excavated. They have acquired the name from having been made the receptacles of skulls and bones removed from the churchyards and cemeteries within the confines of the city, which had become inconveniently crowded with human remains The passages present a singular appearance, the bones having been arranged in the form of crosses and other patterns over the surface of the side-walls. The remains of many of those who were so ruthlessly slaughtered in the revolution of 1792 were thrown into the cata-combs.—Ref. D'Agincourt's History of Art by its Monuments, vol. i.

CATARLAGE, kāt'-ā-fālk (Ital. catafalco, a scaliold), an elevated tomb, usually a temporary structure of carpentry, decorated with painting or sculpture, and containing the collin of a distinguished person, round which tapers, ornamouts, inscriptions, armorial bearings, &c., are disposed. It is generally placed in the middle of a church or large hall. The surcophagus is exposed for show upon an elevation covered with black cloth, and is laid beneath a canopy and surrounded by caudelabra. Some mark or insignia of the rank of the deceased, as a baton, an epsulette, or sword, is placed upon the coffin. In the case of a sovereign or member of a royal family, princely or ducal trophics are

nade use of.

CATALBOTIC, kāt-ā-lek'-tik (Gr. katalektikos, deficient), is a term used in Greek and Latin poetry to denote a verse wanting one syllable of its proper length. Acatalectic is applied to such as are complete, and hypercatalectic to such as have a syllable too

many.

CATALEPSY, kit-ü-lep'-se (Gr. katalepsis, from kata, down or into, and lambano, I seize), in Path, is a disease characterized by a sudden deprivation of sensation and voluntary motion. The attack usually comes on without any warning, and during the paroxysm the patient remains in precisely the same position as he was in at the moment of attack. The circulation and respiration are in most cases but little affected; but cocfisionally they are greatly depressed, and are sometimes even imperceptible. The attack may last only for a few minutes, or it may continue for hours, and even, it is said, for days; and consciousness generally returns with the same suddenness as it left, the patient having no recollection of anything that passod during the attack. This disease bears a great resemblance to thor measurements attack. This disease bears a great resemblance to the measurement of the measurement of the first of the first of the measurement of the measurement of the first of the first

# Catalogue

stomach; and strong ammonia applied to the nos-

trils.

Carlogus, kdt'-à-log (Gr. katalogos, from katalogos,
I register), denotes generally a list or register of things
one by one,—an enumeration of particulars. More
strictly and commonly, it is applied to a list or register
of books in a library. A catalogue of some sort is
absolutely necessary in every large library; but the
plan on which it may best be constructed is a subject
that has given rise to much discussion, and on which
much difference of opinion exists. Each of the proposed plans has its advantages: and there are nowposed plans has its advantages; and there are non-without their disadvantages. They may all be divided into two great classes,—the alphabetical and the classi-fied; in the former the books being arranged alpha-betically, according to their authors or titles; in the latter classified in some way or other according to their subjects. The alphabetical arrangement possesses the advantage of being much more simple, and more easy of consultation; but then people frequently require to consult catalogues for books on particular subjects, of which they know neither the author nor title. To meet this difficulty various attempts at classsification have been made, but all have more or less failed. They have generally been founded upon some attempted classification of human knowledge, in secordance with some theory, either of the powers or functions of the mind itself, or of the order and succession in which the phenomena of the material world may be conceived to present themselves to its contemplation; but, from the time of Bacon downwards, all attempts that have been made at discovering a natural system of classifying all knowledge have been marked by failure. For an account of the multitudinous schemes that have For an account of the intintulations schemes was asset been devised for the cataloguing of books on any such plan, we can only refer for further information to such works as J. F. M. Albert's "Recherches surles Principes works as J. F. M. Albert's "Recherches suries Frincipes fondamentaux de la Classification bibliographique," Paris, 1847; T. H. Horno's "Outlines for the Classifi-cation of a Library," 1825; F. A. Ebert's "Bildung des Bibliothekars," 1820; Brunet's "Manuel du Libraire" (Introduction). Generally, the catalogue-makers now, in place of attempting to solve some of the knoticest problems that have ever puzzled the brains of metaphysicians, content themselves with adopting some convenient and easily-understood classification of the convenient and easily-understood classification of the various branches of literature. It may interest our readers that we give here the heads of a scheme proposed by Mr. E. Edwards, a geutleman of great experience in this way, and one well entitled to speak with authority on the subject. He gives it as particularly suited for a town library (Memoirs of Libraries, vol. it. p. 815, et seq.) Class I. Theology.—I. Holy Scriptures; 2. Sacred philology; 3. Collective works of theologians; 4. Dogmatic and polemic theology; 5. Catechetical theology; 6. Pastoral and hortatory theology. chetical theology; 6. Pastoral and hortatory theology; 7. Mystical theology; 8. Liturgies and treatises on ecclesiastical rites and ceremonies; 9. Works relating to Judaism; 10. Natural theology. II. Philosophy.—1. Collective works of philosophers, and general treatises on philosophy; 2. Treatises on ethics, or moral philosophy in particular; 3. Treatises on metaphysics, or intellectual philosophy in particular. III. History. or intellectual philosophy in particular. III. History,
—1. Works on the composition and study of history,
and on its objects and uses; 2. Universal history and
biography; 3. Ancient history and biography; 4. History of the Middle Ages; 5. General ecclesiastical history; 6. History of Modern Europe generally; 7.
History of Great Britain and Ireland; 8. Modern history of the other countries of Europe; 9. History of
Apparies, 10. Modern history of Africa and of Asia. America; 10. Modern history of Africa and of Asia. America; 10. Modern instory of Arious and of Asia.

IV. Politice and Commerce.—1. General treatises on politics; 2. National constitutions and treatises relating thereto; 3. Treatises on monarchy; 4. on parliamentary representative assemblies; 5. on the administration of civil government; 6. General treatises on law; 7. Collections of laws, and expository treatises on law; 7. Collections of laws, and expository treatises thereon; 8. Treatises on the criminal laws; 9. Political economy; 10. Treatises on church establishments, religious liberty, and matters connected therewith; 11. on public education; 12. on armies and navies—their organization, maintenance, and discipline; 13. on foreign policy, and on the rights, duties, and payment of ambassadors and consuls; 14. Political satires and miscellanies. V. Sciences and Arts.—1. Treatises

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#### Catalogue

on the sciences and arts collectively, dictionaries of on the solences and arts consciency, dictionaries of science and art, general transactions of philosophical societies; 2. Physical sciences; 3. Mathematical sciences; 4. Mechanical arts; 5. Military and naval arts; 6. Arts of design; 7. Art of writing; 8. Musical and histrionic arts; 9. Medical arts; 10. Domestic and recreative arts. VI. Literature and Polygraphy.— 1. General treatises on literature and literary composi-tions, histories of literature in general; 2. Linguis-tics or philology; 8. Poetry and fiction; 4. Oratory, or collections of speeches on various and miscellaneous subjects, and treatises on oratory; 5. Essays, proverbs, and literary miscellanies; 6. Epistolography, or col-lections of letters on various and miscellaneous subjects, and treatises on letter-writing; 7. Bibliography and literary history of particular countries; 8. Poly graphy (i.e. works on subjects extending over two or more of the classes comprised in this scheme). The works in many of these divisions are subdivided into ections, and these frequently into several sub-sections. if the books that they comprise are numerous. (See BIBLIOGRAPHY.)

CATALOGUE, in Astron., a term applied to denote a list of stars, in which their positions at a certain time are registered, according to their latitude and longitude, or right ascension and declination; and means are also given whereby the effects of aberration, precession, and nutation may be computed, and the position of the star in the heavens may be determined at any time. Catalogues are also given of the positions of the nebulæ and fixed stars, and the elements by which the places of the planets and asteroids may be determined. The instruments used in observing the position of the stars, in order to form a catalogue, are the transit-instrument, circle, and sidereal clock. (See CIRCLE, SIDEREAL CLOCK, TRANSIT-INSTRUMENT.) A catalogue of standard stars, by which the right ascension of others may be regulated, will be found in the "Nautical Almanac." Mention is made elsewhere of the principal catalogues of the stars from that of Ptolemy to

the present time. (See ASTRONOMY.)
CATALYSIS, kät-äl'-e-sis (Gr. kutaluo. I dissolve). Catalysis, or power of presence, is a term applied to the chemical action that certain bodies exert upon the chemical action that certain bodies evert upon others, without themselves taking part in the chemical changes resulting therefrom. Thus, yeast converts sugar into carbonic acid and alcohol, without itself entering into the composition of either of these bodies. Examples of this occur in many of the ordinary operations of the laboratory. Chlorate of potash, for instance, melts at 650° Fah., and if the heat is raised to 900° Fah it is decomposed and gives of overgon. 700° Fah., it is decomposed and gives off oxygen; but, if mixed with one-fourth of its weight of black oxide of manganese or copper, oxygen is evolved below 450°.

The term catalysis must be looked upon as merely applied to certain actions, the nature of which is imperfectly understood, and not as implying a special force. Most of these actions may be ascribed to other well-known causes. Mr. Merce, for instance, explains the action of certain metallic oxides on chlorate of potach by supposing that the particles of the exide attract the oxygen contained in the salt with sufficient force to cause its liberation, although the force is not sufficient to effect their union. (For a full elucidation of the most modern views upon this subject, see a paper read by Brodie before the Royal Society, and published in part II., p. 750, of the Philosophical Pransactions.

CATAMARAN, kā-tām-ā-rān', in Mar., a sort of float.



#### Catarrh

of which serves as a keel, the other two as sides. rower stands or kneels in it, and paddles with a piece of bamboo. It is used on the coast of Coromandel,

of bamboo. It is used on the coast of Coromandel, and particularly at Madras, for the conveyance of letters, messages, &c., to the shipping in the roads.

CATAPAN, or CATIPAN, kill-d-pln (Gr. katepanes, captain), a name given by the Greeks in the 12th century to the governor of their dominions in Italy.

CATAPHRYGIANS, kill-d-frij-gins, a sect of hereties that arose in the Christian church in the 2nd century, and required their name from the country of Phryria. and received their name from the country of Phrygia, in which they first made their appearance. Their founder was one Montanus, a native of Mysia, who, after his conversion to Christianity, became subject to trances, in which he uttered what were supposed to be

prophecies, as did also Priscilla and Maximilla, two ladies of rank who joined him. (See MONTANISTS.)
CATAPLASH, kät-ä-plazm (Gr. kataplasso, I beamear or cover with a plaster), in Surg., is a poulties or external application of a pulpy consistence, employed for removing inflammation, promoting suppuration, or relieving pain. They are of various kinds, and may be composed of a great variety of substances, according to the purpose they are intended to serve, being emollient, stimulating, astringent, discutient, antiseptic, anodyne, &c. The common linseed poultice is in all ordinary cases the best that can be used. It is formed ordinary cases the best that can be used. It is formed by gradually stirring the meal into a sufficient quantity of boiling water until the mass has acquired a proper consistence. It is then inclosed in a piece of muslin or thin calico, and applied to the part as hot as it can be borne. The bread poultice is also very useful, though inferior to the former. It may be made either of milk or water, the bread being crumbled in, and the mass allowed gently to simmer over the fire till properly softened, and then beat and stirred about with a groot till of the proper consistence. A cold with a spoon till of the proper consistence. A cold bread-and-water poultice is sometimes used to allay inflammation. Among the other substances employed in the making of poultices are oatmeal, mustard, vinegar, yeast, charcoal, hemlock, digitalis, alum, sagar of lead, carrot, and sorrel. Considerable care is necessary in making the poultice of the proper consistence. It should be sufficiently thick to maintain a certain form when applied, and yet to accommodate

itself easily to the part.

CATAPULTA, kät-ä-pul'-tä (Gr. kalapeltes), an engine of war of great power, used by the ancients for throwing large darts and arrows against the enemy, as the balista was used for throwing stones. It resembled a strong was used for informing issues. It rescribes a strong short bow placed it a frame of wood, securely planted in the ground. The cord was attached to a flat piece of wood, which worked on a slide projecting to the rear. The bow was bent by the action of a small windless at the extremity of this projection. When the cord was suddealy released from the extreme tension to which it had been subjected, the recoil of the bow returning to its original position, hurled the arrow forward with great force. The catapulta is said to have been in-vented by Dionysius, the tyrant of Syracuse, in Sicily,

about 400 B.C.

CATARACT. (See EYE, DISEASES OF THE.) CATARACT, kat-a-rakt (Gr. kuta, downwards; rame, I dash), in Hydrog, a precipice in the channel of the river, caused by rocks or other obstacles stopping the course of the stream, from whence the water falls with a greater noise and impetuosity. The English language has many words that express the different degrees of rapid and sudden descent in streams of water. The term most generally used is falls. Many cataracts are remarkable for their picturesque sublimity. The falls of Niagara, in America, surpass, in size and grandeur, all others in the known world.

all others in the known word.

CATABRI, or Colp, kil-tar' (Gr. katarrhes, I flow down), is the most common of all the disorders to which the human body is subject, more particularly in variable climates, like our own. There are two kinds variable climates, like our own. There are two kinds of this disease,—the one a common cold; the other influenza, or epidemic cold. (For an account of the latter, see INFLUENZA.) A common caterrh is an inflammatory state of the mucous membranes of the head or chest. In the former case it is called cold in the head, or conyza; in the latter, cold on the chest, or bronchitis (which see). The symptoms of a cold in the head are a sense of uneasiness, heat, and stuffing

## Catestrophe

in the nostrils, diminution or loss of smell, dull, heavy pain in the forehead, inflamed eyes, succeing, and a slight impediment in breathing. Generally, it extends also to the throat and chest, occasioning hoarseness, cough, and difficulty of breathing. Frequently there is also a general derangement of the system, loss of appetite, lussitude, chilliness, succeeded by dry feverish heats and stiffness of the joints. The nostrils discharge a fluid at first thin and scrid, but which afterwards becomes thicker, and often purulent. The comwards becomes thicker, and often purulent. The common cause of this disease is exposure to a cold or damp mon cause of this disease is exposure to a cold or samp atmosphere, or to draughts, especially when the surface of the body is warm or perspiring. It is frequently occasioned by passing directly from a warm into a cold atmosphere, and we believe, even more frequently by passing immediately from a cold into a warm atmosphere. Indeed, any sudden atmospheric change is apt, in delicate persons, to produce cold; but in passing from a warm room to the cold air, people generally take some care, though they are not generally aware that the like danger attends passing directly from the cold air into a heaved room, and, hence, do not provide against it. The treatment of a common cold is usually a simple matter. Confinement to the house for a day or two, a warm foot-bath, diluent drinks, abstinence from animal food and vinous or other fermented liquors, and a dosc or two of some gentle laxative, are usually sufficient to remove the disease. There is also what is called the dry method of cure, which has the advantage of not requiring confinement to the house, though, otherwise, some might be inclined to regard the cure as worse than the disease. It consists simply in abstinence from every kind of drink, no liquor, or next to none, being allowed until the disease is gone. Dr. Williams, its inventor, states that the necessary privation is not hard to bear, and that a cure is effected, on an average, in forty-eight hours. He allows, without recommending, a table-spoonful of tea or milk for the morning and evening meals, and a wine-glassful of water at bedtime. The principle acted upon is that of cutting off the supply of watery materials to the blood, and thus leaving nothing to feed the secretion from the inflamed mucous membrane. The best preventive against cold is the daily use of the cold bath, and this is the best means that can be adopted by those who have an habitual tendency to this disease. It should, however, be begun in summer, and the water ought to be at first tepid; but, after being begun, the practice may be continued throughout the winter.

CATASTROPHE, kit-ta'-tro-fe (Gr. katastrophe, from kata and strephein, to turn), is a turning about, a revolution, and generally applied to the final turn or change of events, the change which produces the final event. In ancient dramatic poetry it was applied to the fourth and last part of the play, or that immediately succeeding the catatasis; the whole drama being divided into

protasis, epitasis, catatasis, and catastrophe.

Cat-Bind (Turdus felivox), a species of American thrush, of the same group as the mocking-bird, which it closely resembles in its vocal powers and its courage in defence of its young. It feeds on fruit and berries of all kinds, worms and insects, and builds its nest in the most conspicuous manner, generally in the neighbourhood of human habitations. It derives its name from its peculiar mewing cry when disturbed in its nest.

CATCH-WORD, kitch-ward, among printers is the word placed by itself at the bottom of each page, as being that with which the next page begins. This system is now not much in use; but it is still sometimes employed in writing, particularly in deeds and other formal documents.

CATRCHESIS, kid-e-ke'-sis (Gr. katechesis), is used in a general sense to denote instruction in the rudiments of any art or science, more particularly in the first principles of the Christian religion. It is derived from the Greek verb katecheo, which signifies to sound or ring, and also to ring a thing in one's ears, or to teach orally; and hence, etymologically and originally, catechesis denoted instruction communicated orally in the first principles of the Christian religion. In the primitive church it was the instruction communicated visid received in the condition of the Christian religion. In the primitive church it was the instruction communicated visid the church it was the instruction were called catechists, and the recipients catechimens.

# Categorical Proposition

Carsoniss, kill-e-kize', is to instruct by asking quantions; to examine. In education this is one of the best ways of communicating instruction to the young, and of disciplining their mental powers. By this means their attention is excited and kept up, their knowledge is fixed in their minds, and they are taught to give expression to their thoughts. Unfortunately, however, the mode pursued by teachers is too often not that best suited for the purpose. Instead of having for their object the establishing and adding to the knowledge which he scholar already has, they appear rather best upon despoiling him, and making him doubtful of every particle of knowledge which he possesses; the mode of proceeding being very much like that by which a counsel attempts to bamboozle a witness for the opposite side. It has been well said that "a boy may preach, but it requires a man to catechies."

CATECHISM, kit'-e-kizm, generally denotes an elementary bock, containing the rudiments of any art or science in the way of question and answer; more particularly it is applied to such a work on the simpler doctrines of religion. Catechisms for children should be framed so as not to puzzle and confound, but to conveyinstruction by degrees, and to proceed from the simplest and most elementary principles to the more profound. The earliest catechisms of the Church consisted of no more than a repetition of the baptismal vow, the Creed, and the Lord's Prayer; and these, together with the ten commandments, constituted at first that of the Church of England. Afterwards James I. commanded the bishops to add to it a short and plain explanation of the sacraments, which was accordingly done by Bishop Overall, then dean of St. Paul's, and approved by the rest of the bishops. This is one of the best catechisms in existence, being alike remarkable for its brevity, simplicity, and freedom from sectarianism. The Shorter Catechism of the Westminster Assembly of divines, which is that adopted by Presbyterians, and taught in simues tall the schools of Scotland, is admirable as a comperdium of theology, but is much too profound, and goes too far into the regious

CATECHU, kât'e-ke'u (Jap. kate, a tree, chu, juice), called kut or kutch by the natives of India, is properly an extract prepared from the inner brown-coloured wood of the Acacia Catechu; but the term is now applied also to other extracts similar in appearance and ropperties. Some of the catechu of commerce is prepared from the kernels of Areao Catechu, and a kind called Gambir, or Terra japonica, from the leaves of Uncaria Gambir. The substance is largely employed in the arts of dyeing and tanning, and medicinally as an astringent. It is imported in roundish balls or square pieces, varying in colour from a pale whitish or light reddish-brown, to a very dark brown. The dark-coloured catechu from Pegu is said to be the most powerful of all vegetable astringents. Catechu contains a large proportion of tannin, very similar in properties to that of galls; also a peculiar principle called catechine. (See ACALA, AREA, UNCARIA.)

CATECHMENS, Aktec. ku.-mens, were the lowest order of Christians in the primitive clurch, and were admitted into that order by the imposition of hands and the sign of the cross. The time of their continuance in this state varied at different times and in different places; and frequently it depended upon the proficiency of the catechumens themselves. Though regarded in some measure as Christians, yet they were not even permitted to see the celebration of the cucharist. There were four orders of catechumens.

1. The Exchoumenoi, or those receiving instruction privately without the church, and not yet allowed to enter it; 2. the Audientes, who were admitted to hear sermons and the Scriptures read in church, but not allowed to partake in the prayers; 3. Genuficetonies, so called because they received imposition of handskineeling; 4. Competentes and Electi, the immediate

allowed to partake in the prayers; 3. Genificeteness, so called because they received imposition of hands kneeling; 4. Competents and Electi, the immediate candidates for haptism.

CATHGORICAL PROPOSITION, kill-s-gor'-s-kill, in Log., is a proposition which affirms or denies absolutely, without any condition. They are of two kinds,—pare, such as assert simply one thing of another, as the king reigns; and modal, such as assert one thing of another under a certain mode or form, as the king reigns justify. (See PROPOSITION.)

## Categories

Catherine Wheel

CATEGORIES, kat's-gor-ees (Gr. kategoria, from kategoreo, I declare or predicate), in Log. and Met., is a term applied to an arrangement or distribution under a term applied to an arrangement or distribution under certain heads, of all that may be said or predicated of any object of human thought. According to Aristotle, who enters fully into this subject in his "Organon," all the objects of our thought are comprised in the following ten categories:—1. Substantia, substance; 2. Quantities, quantity; 3. Qualities, quality; 4. Relatio, relation; 5. Actio, action; 6. Passio, passion; 7. Ubi, where; 8. Quando, when; 9. Situs, position; 10. Robitus, possession. Philosophers are much divided in opinion as to the utility of these categories, some researching them as worthless, others of great value. regarding them as worthless, others of great value. According to Harris, "there are few theories so great, so comprehensive, so various, as the theory of these categories: in contemplating them we see whence the sciences and arts all arise,—history out of substance; mathematics out of quantity; optics and medicine out of quality and quantity; astronomy, music, and meshanies out of quantity and motion; painting out of quality and site; ethics out of relation; chronology out of when; geography out of where, &c." The Categories of Aristotle are, in truth, a metaphysical and not a logical reduction, and are methodically deduced and simplified by Sir W. Hamilton, in his edition of Reid's works, p. 687. Mr. J. S. Mill, who objects to Aristotle's classification, attempts another of his own, as follows: -1. Feelings, or states of consciousness; 2. the minds which experience those feelings; 3. the bodies or external objects which excite all that class of feelings which we call sensations; and 4. the successions and co-existences, the likenesses and unlikenesses, between feelings or states of consciousness. The categories of Kant are purely subjective, being merely a gories or Rant are purely subjective, being merely a classification of the conceptions or judgments of the understanding. They are—1. Quantity; 2. Quality; 3. Relation; and 4. Modality. 1 at the first he include unity, multitude, totality; in the second, reality, negation, limitation; in the third, substance and accident, cause and effect, action and reaction; and in the fourth, possibility, existence, necessity.

Compart Efficient (Gr. archau) in Ribblical Criticism.

CATENA, kät'-e-na (Gr., a chain), in Biblical Criticism, is an exposition of a portion of Scripture, formed from collections out of several authors; such as the "Catene" of the Greek fathers in the "Octatench" by Procopius; the "Catena Aurea" of Thomas Aquinas.

CATESTILLAR, kill-or-pil-lin, the common name given to the larve of the lepidopterous insects, butter-flies and moths. There is as great a variety in the form of caterpillars as in the insects to which they change. Each family, genus, and species may be dis-tinguished by its characteristics. The bodies of cater-pillars are generally long, nearly cylindrical, and di-vided into thirteen segments, of which the auterior forms a horny head, furnished with jaws and antenne, and neually with groups of simple eyes. On each side of the body are nine spiracles, or small openings for respiration. The mouth of the caterpillar is usually respiration. The mouth of the caterpliar is usually furnished with strong jaws, capable of tearing, cutting, and masticating the substances on which it feeds, which are very varied in their character, although they entirely differ from the substances eaten by the perfect insect. The first three segments of the body are each furnished with two feet, which represent the six feet of the insect into which they change. All the feet or legs are very short. When the caterpillar has arrived at the proper stage to undergo its metamorphosis, it at the proper stage to undergo its metamorphosis, it seeds some seculated spot. Some species find a retreat in the hollows of the barks of trees, others in the walls or wooden palings of the garden, while a few species bury themselves in the earth. Fortunately for the agriculturist, a great quantity of the lepidopters are destroyed by parssites, which lay their eggs in the larves. The caterpillar undergoes two changes, firstly the testing the secretar united. to the pure state, then to the perfect winged insect. (See Burreners, Morn.)

CAPONY STRINGS, kill-gat, strings prepared from the intestines of sheep for musical instruments, bow-atrings, hatters' bow-strings, clockmakers' cords, and thougs for whips and laces for boots. The intestines are first cleaned and freed from fatty matter, and the

next drawn through a plate perforated with holes, fumigated with sulphur, and sorted according to size. The strings known as "Roman strings" are the beat for violins. They are made at Milan, and are distinguished for their strength and transparency. They are generally formed of two separate pieces twisted together, and great pieces twisted together; and great nicety is necessary in conducting the process of fumigation to which they are subjected, lest they become too brittle if exposed for too long a time to the action of the sulphur, or liable to be frequently out of tune if not exposed long enough.
Larger strings are made by twisting several lengths of
catgut together until the required thickness is obtained. The intestines of other animals have been tained. The intestines of other summas nave been used for making a coarse but strong cord for turning lathes and machinery; but those of the sheep only have been found to furnish strings suitable for musical

nave been found to turnish strings strings at the same and philosophiead purposes.

CATHA, kā'-thit, in Bot., a gen. of plants belonging to the nat. ord. Celastracess. The most important species are C. calulis and spinosa, two shrubs flourishing in Arabia. The young shoots, with the leaves attached, of these plants constitute the famous drug called kat. of these plants constitute the famous drug called kat, khat, or kafta, which is chewed by the Arabs, and is said to produce great bilarity of spirits and an agree-able state of wakefulness. A decoction is also made from it and used as a beverage, like our tea: its effects are described as being somewhat similar to those produced by strong green toa.

CATHARI, ka-thari-re (Gr. katharoi, pure), in Eccl. Hist., was a name given to several sects of Christians who made professions of greater purity in life or doc-trine than others. It was chiefly applied to the No-vatians; but was given afterwards to various sects, known in France and other countries as Albigenses,

Paterini, Paulicians, &c.

CATHARTICS, ka-thar'-tike (Gr. kathairo, I purify), in Med., is a term applied to such substances as, taken in aned, 18 a term applied to such stortainers as, taken internally, cause a special irritation of the intestigal canal, and increase the alvine evacuations; in other words, have a purgative effect. Cathartics act upon the system in various ways, and have been variously divided; as, into stimulating, as jalay, aloes, colombia. cynth; refrigerating, as Glauber or Epsom salts; astringent, as rhubarb; emollient, as castor-oil; narcotic, as tobacco or henbane. One kind is preferable to another according to the circumstances of cach individual case.

nativatal case.

CATHEDEA; kä-the'-drå (Gr., a sent), denotes, in a general sense, a chair: more particularly, a professor's chair, or a preacher a pulpit; and is also used for a bishop's see or throne in a church. Hence, to speak ex cathedrá, is to speak with authority, as a bishop from his throne.

from his threac.

CATHEDRAL, ká-the'-dral, is a church in which the bishop's throne or seat (cathedra) is placed, and which is thus the chief or principal church in the diocese or district. It has usually, also, a dean and body of canons or prebendaries; but this is not essential to constitute a cathedral church, nor is every church that has a chapter of canons a cathedral. (See BISHOP, CANON.) The cathedral church is the parish church of the whole diocese, which, in early times, was commonly called parochia. In Engined no diocese has more than one cathedral, but there are numerous instances of a plurality of cathedrals even in the same The cathedral church is the parish church city, on the continent, particularly in Italy; as at Rome, Milan, &c. The normal plan of an English cathedral is in the form of a Latin cross, that is, a cross whose transverse arms are less than the longitudinal limb. Generally, its several parts are suffi-ciently distinguished as nave, choir, and transept, with asiles, western towers, and central tower; but in more minute description, especially where ritual arrange-ments are concerned, these terms are not always sufficiently precise; and in order to arrive at a more exact nomenclature, it is necessary to trace the changes in a cathedral church from the Norman period to our own (for which see Hook's "Church Dictionary"). The cathedral service is the usual Church of England ser-

vice, intoned, with an anthem and the Fashus chanted, CATHERINE WHEEL, kith's-rine, a circular window, or portion of a window, frequently found in esthedrals and churches built in accordance with the Gothio style external membrane removed. They are then souked, or portion of a window, frequently found in cathedrals and the inner membrane is taken away, after which and churches built in accordance with the Gothio style they are soaked in a solution of potash. They are of architecture. When the entire window is circular

Oatheter

Cours

in form, it is generally found at the east end or in the gables of the transcots. In some of the cathedrals in gables of the transcots. In some of the cathedrals in France, windows of this description are found of great diameter, divided into compartments by stone tracery elaborately chiselled into a variety of forms, and some-times by shafts radiating from a circular centre. The name is taken from the instrument on which St. Catherine of Alexandria suffered torture and death, A.D. 307,

erine of Alexandria suffered torture and death, A.D. 307, for her persistent adherence to the Christian faith.

CATHETER, kāth-e-ter (Gr. kathiemi, I put down or into), in Surg., is the name of an instrument employed for drawing off urine by introducing it into the bladder. It is a long tube, usually formed either of silver or gum-elastic, open at the handle, and having at the sides, near the point, holes or eyes into which the urine flows, and is thus carried off. Those for males are usually from ten to eleven inches in length, and considerably curved towards the point; those for females are much shorter and nearly straight. The males are much shorter and nearly straight. The introduction of the catheter is an operation requiring a considerable degree of tact and skill, and should be

done with great caution.

One with great caution.

On the constant caution.

On the constant caution.

All substances susceptible of direct decomposition by the electric current are called electrolytes, according to Faraday. Those elements which are evolved at the anode are termed anions, and those which are evolved at the cathode, cathions. when water is electrolyzed, two ions are evolved,oxygen, which is the anion, and hydrogen, the cathion. (See ELECTROLYSIS.)

CATHODE, kö'-thode (Gr. kata, from ; odos, a way), a term introduced by Faraday to designate the negative pole of any electrical arrangement for decomposing a chemical compound; the cathode, in other words, is the surface by which the electric current leaves the body undergoing decomposition. (See

ANOBE, ELECTECLYSIS.)
CATHOLIC, käth'-o-lik (Gr. katholikos, general, universal), a term first applied to the Christian church to distinguish it from the Jewish, which was confined to one nation or people. Afterwards, when sects and heresies arose, taking to themselves particular names, those who remained orthodox and adhered to the Church, called themselves Catholics, i.e. members of the Church general or universal. Hence, the Roman the Church general or universal. Hence, the Roman church now calls itself by the name of Catholic, regarding itself as the only true and orthodox church, and holding that all who have separated from her are acctarians and hereities. (See ROMAN CATHOLICISM.)

The seven Catholic episites are those of James, Peter, Indee and Laboratorian as called matchible. Jude, and John, and are so called probably because they were not written to any particular person or church, but to Christians generally. The title of Most Catholic Majesty is borne by the kings of Spain.

CATROLIC EMANCIPATION ACT. (Sec ROMAN CA-

THOLIO EMANCIPATION ACT.)

CATKIN. (See AMENTIM.)
CATOFFEICS, kil-toy'-triks (Gr. kateptron, a mirror), that part of optics which treats of the reflection of light from the regularly-formed surfaces of such of light from the regularly-formed surfaces of such bodies as water, glass, and the metals. The name of speculum, or mirror, is generally given to those substances which have a lighly-polished and regularly-formed surface; but, in general use, the term speculum is applied to a metal reflector and mirror, to a reflector made of glass, and coated with an amalgam of times a supplied to the surface of metal reflector made of glass, and coated with an amalgam of times. and mercury or a layer of pure siler. There are four kinds of reflectors used in optics,—the plane, the convex, the concave, and the cylindrical; and when a ray of light is incident upon any of these surfaces, its re-flection is always governed by the same laws. These laws, which are the result of observation and experiment, form the groundwork of entoptries. They are as follows:—First, that the incident ray, the normal to the surface at the point of incidence, and the reflected ray, are all in one plane; second, that the angle of reflection is always equal to the angle of incidence. (See OPTICS.)

CATOPTROMANCY, ka-top'-tro-man-se (Gr. katoptron, a mirror, and manteia, divination), a species of divina-tion among the ancients by means of a mirror. It is said that among the Achaians, a sick person was wont to let down a mirror by a thread into a fountain before the temple of Ceres, and if, on looking into the glass, 407 his countenance appeared ghastly and distorted, it was regarded as an ill omen; but if fresh and healthy, as an indication that he would recover.

CAUCUS, kaw'-kus, a term used in America to den a political meeting of a party for the purpose of agree-ing upon candidates to be proposed for election to offices, or to concert measures for supporting certain candidates. The origin of the term is doubtful.

CAUDEX, or STIFE, kaw'-dex (Lat. awdo, I out, because, by cutting off the branches, what remains, congrowing) stem of a tree-fern. The candex often rises to the height of fifty or sixty feet, bearing on its same to the height of fifty or sixty fect, bearing on its sammit a crown of foliage. It produces no lateral branches, but is covered with scars produced by the successive whorls of leaves or fronds which have fallen during the life of the plant. The stem is of uniform diameter from near the base to the top.

CAUDLE, kaw'dl. [Fr. chaudeau, from Lat. calidus, warm), is a kind of warm broth, composed of gruel, warm, or her saver and gried and greet to the side.

warm), is a sind of warm oroth, composed of gruel, wine or beer, sugar, and spices, and given to the sick.

CAUI, kawl (Lat. caula, a fold), is a thin membrane, sometimes found encompassing the head of a child when born. This was formerly regarded with great superstition, it being held to denote that the child so born would be very fortunate and escape many dangers.

A caul was also believed to confer the like benefits upon its possessor; and hence they were frequently sold at a high price. They were regarded by seamen as an infallible preservative against drowning. Even so late as 8th May, 1848, an advertisement appeared in the Times, offering, for six guineas, a child's caul, " for which fifteen pounds was originally paid, was affect with its late owner thirty years in all the perils of a senman's life, and the owner died at last at the place of his birth.

Of his Office.

CAULESCENT, kawl-es'-ent (Lat. caulis, a stalk), in
Bot., a term applied to plants having evident stems.

CAULIFLOWER. (See Brassica.)

CAULIS (Lat.), in Bot., the term applied to the stem of an herbaccous plant which dies down annually to the

surface of the ground.

CAUSE, kawze (Fr. cause; Lat. causa), in ordi-ary language is understood to be that by which something known as the effect is produced, and with-out which it could not have existed. Aristotle diout which it could not have existed. Aristotle di-vides causes into four different kinds,—the material, formal, efficient, and final. The first is that of which anything is made, as the brass or marble of a statue. The formal is the form, idea, or pattern of a thing, as the artistic idea or plan of the statue. The efficient cause is the power acting to produce the work, as the mechanical labour employed in producing the status. The final cause is that which led to the production of the thing, as the end or motive in view in the making of the statue. As will be seen from the examples give it is possible for one object to combine all the kinds of causes. Causation, causality, or the action of a cause in producing an effect, is one of the most disputed points within the region of metaphysics. There is believed to be some connection between cause and effect; but the utmost scrutiny has never been able to discover any power by which the cause operates. Experience only teaches us how one event consequently follows another, without instructing us in the secret connection which binds them together. We believe that a cause is something which not only precedes, but has power to produce the effect. The various opinious as to the nature and origin of the principle of causality in the human mind are ranged by Sir W. Hamilton into the causal cause is the contract and cause is the convenienced. into two great categories,—the one comprehending those theories which consider this principle as empirical, or a posteriori,—that is, as derived from experience; the other, those which view it as purs, or a priori,— that is, as a condition of intelligence itself. These two primary genera he subdivides into several subordinate classes.—(See Lectures on Metaphysics, vol. ü. p. 385, seq.) He attempts to explain it by what he terms "the law of the conditioned," or the law of limitation: that we are unable, on the one hand, to exceeive of nothing becoming something; and, on the other hand, of something becoming nothing; that we are utterly unable to realize in the possibility of the complement of existence in the universe being either increased or diminished. Ex nikilo nikil, is nikilum and

# Causes, Final

posse reverti, expresses, according to him, "in its purest form, the whole intellectual phenomenon of purest ferm, the whole intellectual phenomenon of causality." This explanation, however, is not gene-rally received by philosophers.

CAUSES, FINAL, DOCTRINE OF, which, with Aristotle, was merely an inquiry into tendencies, has, by the theologians of modern times, been employed to establish the truth of a divine providence. The argument from final causes, according to Dr. Reid, when reduced to a syllogism, has these two premises:—1. That design and intelligence in the cause may, with certainty, be inferred from marks or signs of it in the effect; and 2. that there are the clearest marks of design and wisdom in the works of nature; the conclusion being, that the works of nature are the effects of a wise and intelligent cause. The remark of Lord Bacon, that final causes are sterile, has frequently been quoted.
"They are sterile," says Dr. George Wilson, "for the same reason as the vestal virgins were; namely, that they belong to God." "Gentle, solemn, and beautiful, they attract men, and modestly permit them to look on their features; but awe mingles with admiration in the gazer's heart, and the ever-burning fires on the vestal altar forbid all close and impious approach. Nevertheless, we must seek after and love final causes even with a lover's passion, although in this life they never can be ours." They are "the most perfect of earthly witnesses to the being and perfections of God.

-Edinburgh University Essays.

CAUSEWAY, kawz'-way, or kawz'-e (Fr. chaussée), a pathway that is raised above the level of the ground. This rame is given to the raised sides of a street that intervene between the houses and the roadway, the outer edge of which is formed by strong blocks of stone called curbstones. (See Curb.) The causeway is gene-rally paved with flat broad flagstones, and sometimes with pebbles set on edge, and rammed tightly together. Canseways are often formed by the sides of roads, for the convenience of foot-passengers, by throwing up a low level bank of some breadth, and along the marshy banks of rivers. In the latter case, faggots are laid down on the yielding soil, and a thick coating of earth and gravel is thrown upon them. A part of the north coast of Antrim, Ireland, between Bengore Head and the mouth of the river Bush, is called the Giant's Causeway, being formed of flat terraces of columnar basalt.
CAUSTIC, kaws'-tik (Gr. kaustikos, from kaio, I burn),

in Med., is applied to such substances as burn or de-troy the skin and flesh by acting chemically upon them. The caustics principally used in practice are the nitrate of silver, or lunar caustic, and potassa fusa,

common caustic, or caustic potass.

CAUTERY, kaw-te-re, in Surg., is a burning or searing of morbid flesh by a hot iron or by caustic medicines, the former mode being termed actual cautery, the latter potential cautery. Caution, kaw'-shun, in Scots Law is an obligation by

which a party binds himself as surety for the perform-

CAVALCADE, kās-āl-kaid' (Fr.), a procession or march
of persons on horseback; a formal, pompous march or cession of horsemen and equipages by way of ceremony, or as a means of gracing a triumph, or wel-

victorious warrior, &c.

CAVALEER, kib-a-leer' (Fr.), in English history was
the name given to those who adhered to the cause of
Charles I., as distinguished from the Roundheads, or

friends of the Parliament.

CAVALTER, in Mil., a work of defence raised on the level of a bastion or curtain, about ten feet above the nampart of the work, with a rampart of its own about wir feet in height. The height of the cavalier must wix feet in height. The height of the cavalier must depend on that of the eminence it is intended to com-hand. The sides should be parallel to the faces of the work on which it is constructed : formerly it was made in the form of a semicircle. The object of this defensive work is to gain height to command any rising ground from which the enemy might direct a fire into the fortifications, and to pour a plunging fire into their respines. Works raised by the attacking party on the facts of a fortification, consisting of a series of stops or and by a bank of earth revetted with gabions, from which are may be directed into the common way, are tronch cavaliers.

## Cavalry

CAVALEY, kav'.dl-re (Fr. cavalerie, from obeval, whose; ital. cavalere, a horseman or knight; Sp. cabalero, a horseman; Lat. cabalkus, a horse), a mame applied generally to soldiers mounted on horseback. The British cavalry consist of thirty-one regiments, of which two are called Life-guards, one Horse-guards, seven Dragoon guards, of which the 6th are distinguished as Carabiniers, and twenty-one ordinary dragoon regiments, which are classed as Dragoons, Lightdragoons, Lancers, and Hussars, as follows:—Dragoons, 1st, 2nd, 6th; Lancers, 5th, 9th, 12th, 16th, 17th; liussars, 3rd, 7th, 8th, 10th, 11th, 13th, 14th, 15th, 19th, 19th, 20th, and 21st. The English cavalry are superior in weight to, and better mounted than, any cavalry in in weight to, and better mounted than, any cavalry in the world. At Waterloo the French cuirassiers could not for a moment withstand the charge of the lifeguards, for man and horse were overturned by the impetus with which the household cavalry was launched against them, and literally ridden over by them. A regiment of dragoons consists of eight, and sometimes ten troops, of about eighty meneach, including non-commissioned officers; each troop has a captain, lieutenant, and cornet; and two troops form a squadron, and four squadrons a regiment. The term dragoon is derived from the weapon with which the French cavalry were armed, that were raised about 1600 by the Mareschul de Brissac, to surpass the famous German reiters, who were skilled in the use of the pistol on horseback. This was a short blunderbuss, with the muzzle formed like the yawning jaws of a dragon; whence those that were armed with it were called dragoniers, and then dragoons. The other names applied to English cavalry namely, lancers and hussars-have also been derived from foreign troops, the former being in imitation of the Polish lancers of the French army, who were armed with a long lance, and the latter from the hussars, or houssards, a species of light cavalry that formed part of the national armament of Poland and Hungary With the exception of the lancers, who carry a lance sword, and pistols, the English cavalry, both light and heavy, is armed with sword and carbine. The cavalry carbine is now a short breech-loading rifle, sighted for The average annual cost of a cavalry regi-600 vards. ment, including horses, is considered to amount to £25,000. The price of a horse is about £20 or £25, and it costs as much more to train him and render him fit for service. Cavalry, in latter times, have been all-important in confirming and securing a victory, by pursuing the flying foe, and turning what might otherwise have been a retreat into a rout. But, in early ages, battles were mainly fought with cavalry, who were enrolled from among the nobles and the more wealthy part of the population. The natural features of Greece rendered it impracticable for the Greeks to make their cavalry of similar importance to that of other nations, and they depended entirely on their infantry; but the Romans, although they paid great attention to the discipline and effectiveness of their infantry, had large bodies of caralry with every consular army, who were all men of good family and position. The cavalry of the Parthians was skilled in attack and flight when needful; they would lure on the foe by a feigned retreat, and bring down soldier after soldier with unerring aim while galloping at full speed on horseback. The cavalry of the Anglo-Saxons, and of the Huns, Goths, Vandals, and northern tribes that destroyed the mighty Roman empire, were justly famous, and composed the bulk of the armies of the day. The armies of the Middle Ages were composed chiefly of armics of the hiddle Ages were composed emerged cavalry, and, in the time of the Crusades, infantry were but little esteemed; but at Agincourt, Cressy, and Poictiers, the English bowmen did galant service, and, with the introduction of gunpowder and cannon into warfare, infantry and artillery began to equal cavalry in importance, and were soon considered more essential to bear the brunt of the battle. In the early part of the lath century, the cavalry of Poland, or Pospolits, as it was termed, consisted of the nobles and site of the kingdom, who were magnificently armed and accourted. Who does not admire the gallant volunteer cavalry of Charles I., that made such brilliant charges, punder Runer, the Monta of the date of cavalraged from under Rupert, the Murat of his day as a cavalry officer, against the stern iron-clad troopers of the Parliament. Many of the sons of these cavaliers, doubtiess, served in the Scotch Greys, the first regular regiment of

cavalry that was raised in England, by Charles II., in 1661. Since that time, the cavalry has always formed a distinguished arm of the British military service. The following are the distinctive duties of heavy and light cavalry in the British service:—The latter make gathering provisions, as well as in pursuit of a flying foe; while the former are used to cover the retreat of soe; while the former are used to cover the restrict of an army, and charge the enemy's cavalry and infantry, and capture his guus. It is considered that infantry formed in square to resist cavalry cannot be broken; but at the battle of Mohammerah, in Persia, March 26, 1857, British cavalry broke a square of Persian infantry, and rode through them; for Captain Wren, a man of gigantic size and power, who was foremost in the charge, having lifted his horse at the bristling line of bayonets, bove the men that held them to the ground under the weight of himself and his charger; thus enabling those who were at his heels to penetrate the square. When about to make an attack, the cavalry, like the infantry, are divided into the attacking force, the supports, and the reserve. Cavalry charge cavalry in line, infantry in column, and artillery in eckelon. (See ECDELON.) Its chief use is in pursuit or in covering a retreat, and an encounter with cavalry is a hand-to-hand combat, which is seldom the case with infantry, and can never

happen with artillery.
CAVEAT, kai'-re-at (Lat. caceat, let him beware; from careo), is a caption entered in the spiritual court, to stop institutions of clerks to benefices, probates of wills, administrations, and such like, from being granted without the knowledge of the party that enters it. The caveat being lodged or entered, the proceedings are thereby stayed, and the promoter, if he intend to proceed, must warn the other party to his caveat, who can then enter and dispute the right in a suit to be instituted for the purpose of trying it. If he fail to do so, the matter will proceed as if the caveat

had not been entered.

CAVES, or CAVERNS, kaivs, kiv-erns (Lat. caves, caverna, hollow), hollow places in the earth. They occur more or less along the rocky shores of all frectiowing seas, and are the results of abrasion by waves laden with fragments of stone, and acting upon preexisting fissures or the softer portions of the exposed rocks. The most celebrated caverns, however, occur in limestone strata, and appear to be the results partly of fissuring by subterranean disturbance, and partly of waste by the percolation and passage of carbonated waters. Some are celebrated for their great extent, waters. Some are described to their great strent, others for their gorgeons stalactites and stalagmites, and many for their treasures of sub-fossil bones. Among the most remarkable caverns may be mentioned, one in the limestone rock at Kirkdale, Yorkshire; those found in the carboniferous limestone of Chamorganshire, in which remains of British pottery have been found, in addition to bones of birds and beasts, which have been dug up more than eight feet below the present surface; and Fingal's Cave, in Staffa, an island on the west coast of Scotland, a fine example of a natural cavern in basalt or igneous rock. In the limestone strata of Derbyshire caverns are found lined with a calcureous deposit of brilliant whiteness, with pieces like icicles of great size hanging from the roof and rising from the floor. These pieces sometimes meet and form columns. Among the Derbyshire limestone caverns, Peake's Hole, near Castleton, Poole's Hole, and the Bagshaw Grottos, are the most remarkable.

CAVIARE, or CAVIAR, kar's airs (Sp. cabial; Arab.

gabier, from the Arab word gebara, signifying to press or strain, and season with fat), an article of food prepared in Russia from the roe of the sturgeon or some other large fish, and is mude by washing it in strong vinegar, and afterwards salting. The tasto for esting earlier is acquired; most people at first finding its "most ancient and fish-like smell" and oily taste very disagreeable. It is, therefore, only epicures who appreciate it: hence the proverb of "caviare to the multitude," which is applied to anything not likely to be appreciated by the common people.

CAVE. (See GUINEA-PIG.)

CAYENER PEPPER. (SeeCarsicum.)
CRANOTHUS, se-in-o'-thus (a name given by Theophrastus to a spiny plant), in Bot., a gen. of plants
belonging to the nat. ord. Rhamnacea. The young

shoots of C. americanus are used as an astringent, and in New Jersey the leaves are employed as a submittate for tea; hence they are commonly known as No Jersey tea.

CREIDE, se-bi'-de (Gr. kebos, a species of monkey), a term applicable to all the monkeys of the American

continent.

CERRIO, seb'-re-o, a fam. of coleopterous insects of sculiar structure. The body is of an oblong form, peculiar structure. The body is of an oblong form, arched above and deficaed in front; the mandibles curved, and entire at the tip. The thorax is broaded behind, and the antenne generally longer than the head and thorax. Some of these insects are remarkable for having the antennæ beautifully pectinated and of very great length.

CRCIDOMYIA, se-se-do-mi'-ü (Gr. kekidos, high-leap-ing; muia, a fly), small two-winged flies, that de-posit their eggs on the buds of growing plants. The best known is the wheat-fly (Cecidomyia visitei), that may be seen in immense masses flying about what folds shout I. wheat-fields about June. It deposits its eggs in the centre of the corolla, where the larva is hatched; and, by devouring the pollen, the plant is greatly damaged. When first hatched, they appear in the form of ting footless maggots, taper towards the head, and blunt at footless maggets, taper towards the head, and blunt at the hinder extremity, with the rings of the body somewhat wrinkled and bulging at the sides. They are at first perfectly transparent and colourless, but soon take a deep yellow or orange colour. The maggets, when fully grown, are nearly an eighth of an inch is length. It is said that they quit the wheatears at the beginning of August, and descend into the earth about half an inch below the surface, where they probably remain throughout the winter, making their appearance again in the shane of winced flies when the spring cora again in the shape of winged flies when the spring corn begins once more to show its head.

Degins once more to show its head.

CECHOPIA, see kro'-pi-d (after Cecrops, king of Athens, whose legs were fabled to be of snakes), in Bot., a gen. of plants belonging to the nat. ord. Artocarpaceæ. C. pelitata, a tree growing in the West Indies and South America, is remarkable for its stems being hollow except at the nodes. Owing to this peculiarity, the smaller branches are often used for making wind instruments.

CENTER (See CENTER)

CEDAR. (See CEDRUS.)

CEDAR-BIRD, sel-dür (Ampelis cedrorum), a native of America. The appellation of Cedar-bird is given to it on account of its partiality to the berries of the cedar. The passion of the cedar-bird for this diet cedar. The passion of the cedar-bird for this dies sometimes leads it into excesses, and, perhaps, premature death. As many as fifteen berries have been found in the throat of a single bird, "The nest is large for the size of the bird, fixed in the forked or horizontal branch of an apple-tree, ten or twelve feet from the ground; outwardly, and at the bottom, is laid. a mass of coarse dry stalks of grass, and the inside is lined wholly with very fine stalks of the same material. Inned wholly with very fine stalks of the same material. The eggs are three or four, of a dingy bluish white, thick at the great end, tapering suddenly, and becoming very narrow at the other; marked with small roundish spots of black, of various sizes and shades, and the great end is of a pale, dull, purple tinge, marked likewise with various shades of purple and black."

(Wilson's American Ornithology.) The tactics of the parent bird when disturbed in its nest are singular. On such occasious, the female at once flies off to a distance; it neither exhibits the least distress, nor utters a solitary cry of lamentation, and the intrader is left to examine the eggs or young at his leisure. The cedar-bird is largely consumed as an article of food, and at the end of autumn is, owing to its voracity, in prime condition. At this season a great quantity are sent to the markets. The colour of this bird is, on the upper parts, of a fawn-colour; the chin is black, and the abdomen and breast yellow. The wings are slaty-blue; the tail-feathers are rich yellow. Round the forchead there is a dark line, covering the eyes. It is about six inches and a half in length, and is rather a slim-built bird.

CEDAR-WOOD, OIL OF, an essential oil procured by distillation from cedar-wood at the rate of twenty-eight ounces to the hundredweight of shavings. contains cedrola, a white crystalline solid, and cedrene, a liquid hydrocarbon.

CEDAR-WOOD, TINCTURE OF, is readily made by

#### Cedrat

steeping the shavings of the wood in proof spirit. Mixed with a fourth part each of tincture of myrrh and rhateny, and flavoured with a few drops of oil of peppermut, it forms a valuable mouth-wash, termed "Ran Botol."

Capar, se'-deit, a perfume procured from the rind of the citron (Citrus medica) by expression and distillation. It is much used in the manufacture of scents, from possessing a peculiarly refreshing lemony odour. Extract of cedrat is made by dissolving two

odour. Extract of cedent is made by dissolving two ounces of the oil of citron in a pint of spirits of wine. Capazita, se'-dre-lā (from cedrus, the cedur-tree, its wood having an aromatic resinous seemt like it, in Bot., a gen. of tropical trees, the type of the nat. ord. Cedrelacca. C. Jobrifuga, C. Toona, and other apposies, have febrifugal and settingent barks, which have been used as substitutes for ciuchona. C. Toona trackers which is research in the company which is research. durnishes timber resembling mahogany, which is much used in the East Indies, and is occasionally imported into this country under the names Toon, Tunga, Poms, and Jees-wood.

CEDEBLACER, se-dre-lai'-se-e, in Bot., the Mahogany fam, a nat. ord. of dicotyledonous plants in the sub-class Thalamiflore, consisting of nine genera, including twenty-five species, chiefly natives of the tropical parts of America and India,—trees with alternate, pinnate, exstipulate leaves. The flowers are hypogynous and symmetrical; calyx and corolla with 4 or 5 divisions, both imbricated in astivation; stamens double the number of petals, with united or distinct filaments, and number or petals, with united or distinct filaments, and inserted on a hypogynous disk; owary usually 4 or 5-celled, with 4 or more ovules, and a simple style. The fruit is eapsular, with axile placentss; seeds usually numerous, flat, and winged. The plants of this order have aromatic, tonic, astringent, and febrilingal properties, and many of them are valuable timber-trees. Mahogany and satin-wood are products of the Cedrelance. (See Swiftment). Children valority. lacea. (See SWIETENIA, CHLOROXYLON.)

CEDRONE SEEDS. (See SIMABA.) CEDRUS, se'-drus (Gr. kedros), in Bot., the Cedar, a gen, of trees belonging to the nat. ord. Pinacer, subord. Abietex. The cedar of Lebanon (C. Lihani) has been celebrated from the earliest ages for its grave beauty, its longevity, and its magnitude; also for the excellence and durability of its timber. It is often alluded to in Scripture as an emblem of stability and prosperity. The grove of cedsrs on Mount Lebanon is about three-quarters of a mile in circumference; but of the four bundred trees now standing there are but the four number a trees now standing; there are but twelve of extraordinary age. One of these is sixty-three feet in circumference, and has possibly been in existence for some two thousand years. The cedar was introduced into England in the latter part of the 17th century, and one specimen at Sion House, London, is now eight feet in circumference at three feet above the ground. The Deodar, or Himalayan cedar (C. deodara), is also a magnificent tree, and is held in great veneration by the Hirdoos. The turpentine obtained from this species is much used in India for medical purposes, and is known by the name of Kelon-ke-tel.

Chiling, seel ing (Lat. ceilum, Fr. ciel, the heaven), in expression applied to the top or covering of a room, or any lofty building of great size, as a church. It is derived from words in the Latin and French languages that are used to denote the vault of heaven, which seems to cover that part of the world that lies within seems to cover that part of the world that lies within the circle of our horizon, in the form of an immense vault; and it is probable that the observation of this led to the adoption of the term. The ceiling is formed by nathing laths to the under surface of the joists that surport the floor of the story above or the beams of a roof, and covering them with two or three coats of plaster. The ceilings of churches are often semicircular in form, and divided into large squares by beams adorsed with bosses at the points of intersection, and that of the chancel is sometimes coloured blue and sdormed with bosses at the points of intersection, and that of the chancel is sometimes coloured blue and studded with stars. Flat ceilings are sometimes distincted in this way, and adorned with painting and pilding; and those of houses of the Tudor period are recoonly enriched with mouldings.

Charanta, si-me-li-d (fr.), was anciently applied to the carly Church denoted the sacred vessels and distincts belonging to the church. Hence, Ceimeliar-470

## Celibacy

cha, or Ceimeliophylax, was the officer, in ancient churches and monasteries, who had the custody of these things; and as rolls and archives were also under his charge, he was also frequently called Cor-tophylax, or Custos archivorum.

CELLERINE. (See CHELIDONIUM.)
CELLERINE, sel'-ā-rent, among logicians is a name
given to a mode of syllogism, in which the major proosition and conclusion are universal negatives, and the minor a universal affirmative; as,-

CE. None whose understanding is limited can be omniscient.

Every man's understanding is limited. RENT. Therefore, no man is omniscient.

CELASTRACEE, se-läs-trai'-se-e, in Bot., the Spindle-CELASTRACEE, se-dis-trati-se-e, in Bot., the Spindle-tree fain, a nat. ord. of dicotyledonous plants in the sub-class Calgriflora, consisting of 30 genera and about 260 species, chiefly natives of the warmer parts of Asia, North America, and Europe, though many are found at the Cape of Good Hope. They are shrubby plants, with simple leaves and small deciduous stipules. Flowers small, regular, and perfect, or rarely unisexual by abortion: sepals and perfect, in phinated in by abortion; sepuls and petals 4-5, imbricated in sestivation; stamens equal in number to, and alternate with the petals, and inserted with them on a large, flat, expanded disk; ovary superior, placentas axile; fruit superior, 2-5-celled. The plants are chiefly remarkable for the presence of an aerid principle. The seeds of some contain oil; those of Celastrus paniculatus yield an oil used as a medicine in India. Two other species of the typical genus, C. scandens and sens-galonsis, have purgative and emetic barks. (See CATHA, ECONYMUS.)

CELERY. (See APIUM.)
CELESTINE, sel'-es-tine, a mineral found in rhomboidal prismatic crystals, consisting of sulphate of strontia. It is the commonest mineral of strontia.

strontia. It is the commonest mineral of strontia. Criestins, self-es-tins, a religious order, founded in the 13th century by Peter de Menron, who was afterwards raised to the papul chair as Celestin V.; whence they took their name. This order speedily extended itself in Italy, France, Germany, and other parts of Europe. Their habit consists of a white gown, a capuche, and a black scapulary. When they go out, they wear a black cowl with the capuche. They are they wear a black cowl with the capuche. They are allowed no animal food except when ill, and have frequent fasts. They rise two hours after midnight to say makins. This order was numerous in the middle

of last century, but it is now nearly extinct.

Chlibacy, sel'-ab-a-se (Lat. cælebs, unmarried), is

the state of wnmarried persons. In the ancient world celibacy was generally viewed with disrespect, and legal enautments were sometimes issued against it. Among the Spartans those who lived in celibacy were subjected to various disadvantages, and in their old age were not treated with the same respect as other citizens. Among the Romans various means were adopted to discourage celibacy, and frequently fines were imposed upon old backelors. Dionysius Halicarnasseus mentions an ancient constitution whereby all persons of full age were compelled to marry; but the first law of this kind of which we have any certainty was that enected under Augustus, called Lex Julia de Maritandis ordinibus, and afterwards Papia-Poppaa, or Julia Papia, from certain amend-ments made on it under the consuls Papius and Popments made on it under the consuls l'apius and l'op-peus. By this law divers percogatives were given to those who had many children, and ponalties im-posed on all that led a single life—as, that they could not succeed to an inheritance except of their nearest relatives, unless they married within 100 days after the death of the testator. The Church of Rome imposes a universal celibacy on all its clergy, from the pope to the lowest deacon and subdeacon. The advocates for this usage pretend that a vow of perpetual celibacy was required in the ancient Church as a condition of ordination even from the carliest apostolic times. This, however, was evidently not the case, for we possess numerous examples to the contrary. It is erally believed that most of the apostles were margenerally believed that most or was, and Philip, one of the even descens was also a married man. St. Paul the seven deacons, was also a married man. St. Paul asserted that he had the power "to lead about a sister, a wife, as well as other spostles" (1 Cor. ix. 5). In

the ages after the apostles, we have accounts of several married bishops, presbyters, and deacons. Polycarp mentions Valens, presbyter of Philippi, who was a married man; and there are still extant two letters of Tertullian, a presbyter of the 2nd century, addressed to his wife. Novatus was a married presbyter of Carthage, as we learn from Cyprian, who was, in the opinion of some, also bimself married; and so was Oscilius, who converted him, and Numidius, another presbyter of Carthage. Many of the ancient fathers, however, wrote in favour of celibacy; and as early as the beginning of the 4th century some persons in the Church advocated the passing of a law obliging the clergy to abstain from marriage. At the council of Nice, A.D. 325, a motion was made to that effect; but it was so strenuously opposed by Paplinntius, an Egypthe was observed by the state of the life court of the 11th century, and even then it was loadly com-plained against by many writers. The old English and Welsh records show that the deergy were married there as late as the 11th century. Celibacy was established in the Greek church by the council of Trullo, 692, but only as regards bishops. Presbyters, deacons, and all the inferior orders, may live in the married state after ordination. Perhaps celibacy more than anything else is to be regarded as the weak point of the Roman Catholic church, and that which contributed most to the success of the Reformation. The violence thus done to human nature was the cause of the gross immorali-ties that prevailed in the Church, and rendered the priesthood the despised among the people. At the time of the Reformation the attention of the Church was directed to this subject, and it was discussed at the council of Trent (1563), whether celibacy ought still to be maintained; but the majority were in its favour. CELLAR, sel'-lür (Lut. cellarium).—A room under a

house or other building used as a repository of liquors

and other stores for a family.
CELLARIUS, or CELLEBARIUS, sel-lai'-re-us (Lat. cellarer), an officer in monasteries to whom belonged the care and procurement of provisions for the convent.

CELLIFFS, sel'-lites, a religious order, founded at Antwerp in the beginning of the 14th century. Their patron was one Alexius, a Roman; and hence, in Italy, they were called Alexians, but in the Netherlands and Germany, where they had many monasteries, Cellites.

CRLLS, sells (Lat. cella, a cell), in Phys., are closed vesicles, or minute bags, formed by a membrane in which no definite structure can be discerned, and having a cavity which may contain matters of variable consistence. These cells, remaining as separate corpuscles in the fluids, and grouped as separate corpuscles in the fluids, and grouped together in the solids, persisting, in some cases, with but little change, in others undergoing a partial or thorough transformation, produce the varieties of form and structure met with in the animal and vegetable textures. The embryo animal, as well as the embryo plant, is, in its early stages, entirely formed of cells of a simple and uniform character; and it is by a gradual transformation in the progress of development that some of these cells become converted into the diversified elements of a complex fabric. We find in the operations of the simple cell an entitone, as find in the operations of the simple cell an epitome, as it were, of those of the highest and most complex plant, which again bear a close resemblance with those that are immediately concerned in the nutrition and trast are influently concerned in the nutrition and reproduction of the animal body. Every cell owes its origin, in some way, to a pre-existing cell. In plants, the most common mode of multiplication is the subdivision of the original cell into two halves. Sometimes the new cells originate in little bud-like prominences on the surface of the parent cell, which, after a time, become detached and form cells. Cells have properly a spheroidal or rounded shape, but they assume va-rious forms from coming in contact with other calls Certain of the animal tissues, in their earlier conditions, appear in form of accongeries of cells, almost entirely resembling the vegetable cells, and in their subsequent transformation pass through a series of changes resembling those that occur in vegetable de-

velopment. In animals, as in plants, there are two principal ways in which cells may be developed; namely, within the cavity of a previously existing cell, in white case the process is said to be endogenous; or in the midst of a plastic fluid, or blastome, probably contain-ing cell-gorms, which has been prepared or elaborated by cell-gorms, but of a previous generation, but which has been set free by their rupture. The nucleus seems to per-form a much more important part in animal than in plant cells, in which, indeed, as a rule, it is absent; and even in animal cells it is often wanting. It is a small round or oval body in the interior of the cell, sometimes lying free, but at other times attached to the cell-wall, and averaging in dismeter, in the spinned cells, from  $\frac{1}{10000}$  to  $\frac{1}{10000}$  of an inch. In the conversion of cells into the several tissues, there is in different instances a great difference, not only in the nature and extent of the change which the cells undergo, but also in the condition which these bodies have attained when the process of change commences. In some cases they have already acquired a distinct cell-wall and cavity; in others they never attain the condition of cells strictly. so called, and the process of transformation begins while they may be said to be but in a nascent state. The following are the principal modes in which cells or their elements are metamorphosed:—1. Increase in size and change of figure; 2. alteration of substance and of contents; 3. division into fibrils; 4. changes in the relation of cells to each other: 5, formation of membranes and fibres from the blastema, without the intervention of actual cells; 6. changes in the nuclei of cells; and 7. ulterior changes in the blastems.
Two or more of the processes here mentioned may occur in the same cell.—Ref. Kölliker's Manual of Human Histology; Von Mohl's Anatomy and Physiology of the Vegetable Cell; Carpenter's Principles of Physiology Carte Control of the Control of the Control of the Carpenter's Principles of Physiology. Physiology; Quain's Anatomy. Cellular Tissue, scl'-lu-lar, in Anat., is the old

name given to what is now commonly known as areolar, reticular, or connective tissue. It is composed of a large number of small transparent fibrils, each about  $\pi_{0\bar{b}_{10}\bar{b}_{10}}$  of an inch diameter, crossing each other in all directions, and leaving small open spaces, or areales; whence its name of arcolar tissue. This is one of the most extensively diffused of all the tissues of the human body, forming the connecting medium of all the others. It is very sparingly supplied with blood-vessels, and no nerves have been found distributed to it.

CELLULAR TISSUE, in Bot. (See TISSUES.)
CELLULARES, sel-u-lä-res, in Bot., plants composed
of cellular tissue only, forming one of the two great
subkingdoms in De Candolle's system of classification.

CELOSIA, se-lo'-si-ii, in Bot., a gen. of plants belonging to the unt. ord. Amaranthacea. Several species have bright-coloured persistent flowers, and are cultivated in our gardens. The best-known is C. cristata, the cock's-comb.

Cher, sell (Lat. cellis, a chisel), in Archeol., is the name given to certain instruments of stone or bronze, used by people in the earliest state of civilization, and found chiefly in tumuli and other early earthworks in Western Europe. The term has been somewhat loosely applied to various kinds of cutting instruments; but it is now generally restricted to chisels or small instruments of a similar character. Some of the stone celts are extremely rude and insartificial, but others are beautifully shaped and highly polished. They vary considerably in size, but are commonly about six inches in length, and generally bear some approximation in shape to an incisor tooth. Bronze celts belong to somewhat higher state of social progress, and present a greater diversity of form than the stone celt. There are numerous examples of both kinds in the British Museum.—Ref. English Cyclopædia—Arts and Sci-

CELTIBERIANS, selt'-i-be'-re-ans, or kelt'-i-be'-ri-ans, & CELTIBERIARS, self-i-be'-re-ins, or kell-i-be'-ri-ins, a people of nucient Spain, who are supposed to have been descended from the Celts of Gaul, who, having immigrated into Spain, became mixed with the native Iberaus; and thus their descendants became distinguished for the best qualities of both peoples. They inhabited a large inland district of Spain, corresponding to the E.W. portion of Aragon, pearly the whole of Chenga and Soria, and a large part of Burgos. They were a brave and warlike people, equally distinguished as cavalry.

## Celtic Architecture

and as foot-soldiers, and proved formidable antago-nists both to the Cartheginians and Romans. They were subdued by Hannibal with difficulty; and, after having submitted to the Romans in the second Punic war, they subsequently revolted against them. It was not till after the wars of Sertorius that they were finally subdued, and began to adopt the Boman language and

CELTIC ARCHITECTURE, self-ik, or kelf-ik.—This term is sometimes applied to the rude attempts at building in stone which were made by the Celts of Gaul and Britain. They consist chiefly of Druidical remains in the form of temples and cromlechs. The temples were huge blocks of stone set up in a circle, in a vertical position, which support others placed horizontally upon them, as imposts or lintels. Some of these stones bear traces of the chisel, and the upright and transverse blocks were often litted together with mortise-and-tenon joints. The cromlechs, which consist externally of a large block supported on three or four smaller ones, were supposed to have been altars on which the Druids sacrificed human and other victims; but they have been found to be monumental records covering cavities below the surface of the earth, in which bones of men and animals, and stone implements, have been discovered. The finest Druidical circles or temples amouvered. The linest Drudgest circles of temples that still remain tolerably perfect are those of Stonehenge and Avebury, in Wiltshire, and of Carnac, near Aursy, in the department of the Morbihan, in the north-west of France. Cromlechs are to be found in many parts of the British isles, the Channel Islands, France, and other parts of Europe. The most remarkable in this country are at Plas Newydd, in Anglesey, and near Aylesford, Kent, the latter of which is known as Kit's Coty House.

CELTIE, celt'-is, in Bot., a gen. of trees belonging CRITE, set-ts, in Dot, a gen. of trees belonging to the Umasee, or Elm order. The fruit of C. occidensalis, which is commonly known as the Sugar-berry or Nettle-tree, has a sweetish, astringent taste, and has been used with some success in dysentery. C. orien-

talis has aromatic properties.

CHLTB, OF KELTS, selts, kelts (Lat. Celtæ; Gr. Keltai, Galatai), an ancient race of people, which at one time appear to have inhabited the greater part of Central and Western Europe. The recent researches of philo-logists have shown that the Celtic language belongs to the Inde-Germanic group; but at what time they migrated westward is unknown. They appear to have been divided into two great families,—the Gauls, who inhabited Gaul, to whom the name of Celts is more properly applied, and the Cimbri, or Cimmerii, who appear to have migrated from Asia at a later period, and spread themselves over Germany to the Ocean. and spread themselves over Germany to the Ocean.
Herodotus, the father of history, mentions the Celts
and Opnete as inhabiting the remotest parts of Europe
towards the setting of the sun, near the sources of
the Danube. A great immigration of the Gauls into
Itsly took place in the reign of the Roman king Tarquinus Priscus, under the leadership of Bellovesus; ammas triscus, under the leadership of Bendeshis, and at the same time another horde of them, under Segovesus, crossed the Rhine, and, advancing as far as the Hercynian forest, settled along the Danube, and in the country now called Bohemia. At a very remote paried the Celtze had also passed into Spain, where their descendants became afterwards known as Celtiberians; and they likewise crossed over into Britain. Several subsequent irruptions of the Gauls took place into Ealy; and in B.C. 390 the city of Rome was taken and burned by these barbarian. About 280 n.c. a vast imilitinde of Celts or Gauls invaded Macedonia and registering of Celes of reason invasion and contains and Crescoe, spreading terror and devastation everywhere before them, and, after making immense booty, returned homewards. An invasion of barbarians from the east of the Rhone and north of the Danube, about the cast of the Rhome and north of the Danube, about 12.0, 113, first made the Romans acquainted with the 12.0, 113, first made the Romans acquainted with the 12.0, 113, first made the Romans acquainted with the 12.0, 113, first made the Romans and Cimbri attacked the Beign; and Comment attacked the Beign; and Comment that the Reign meo, I sleep), denotes hierally a dormitory, or place of comment and Teutones from invading their tentiory. The power of the Celts in Europe was, however, or time decline long before the time of Comment. The Gaula of Italy had been subjugated by the Romans; and in Gaul they were pressed on one side by the Beign and in Gaul they were pressed on one side by the Beign and in Gaul they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in Gaula they were pressed on one side by the Beign and in the control of the Comment o

## Censer

Wales, the Highlands of Scotland, the Isle of Man, and Ireland. The Celtic tongues are the Scotch and Irish Gaslio, the Manx, Welsh, Cornish, and Breton. The Basque, it is now generally agreed, is not a dislect of the Celtic. We know nothing of any original Celtic alphabet, nor of any works in that language; but in Grut they seem to have become acquainted with the Greek language from the colony of Massilia (Marsilles). The Celts were men of large size, fair nomeables. Greek language from the colony of Massilia (Marsilles). The Celts were men of large size, fair complexion, blue eyes, and light-coloured hair. They were of a fickle disposition, warlike, vain, boastful, and clamorous. Their government seems to have been a kind of aristocracy, their chiefs forming a senate or supreme conneil. The Druids formed a powerful body among them, being the guardians and interpreters of their laws, as well as the ministers of their religion. They were also the instructors of the people in all kinds of knowledge with which they were acquainted. Their hards or notes had also creat influence among their bards or poets had also great influence among them, and used to accompany their songs with instrumental music on harps and the like. The Celts had no temples nor images, but worshipped their deity in groves and forests. Their religion seems to have been originally a sort of Theism; but they afterwards adopted some of the gods of the Germans and other natious is undoubted that they offered human victims in their sacrifices .- Ref. Prichard's Eastern Origin of the Cellio Nations, edited by Dr. Latham, 1857; Smith's Die-tionary of Greek and Roman Geography; English Cyclopadia-Arts and Sciences.

CEMENT, se-ment', a term applied to those build-ing materials of a calcareous and silicious nature which, mg materials of a calcareous and smicrons nature which, when mixed with water, set quickly. By this property they are distinguished from mortars, which require time to harden. Natural cements are obtained by calcining srgillaceous limestone containing silicate of alumina. The stone being burnt, the carbonic acid is driven off, and when water is added, a hydrated silicate of lime and alumina is formed. Cements thus made are known in England as Roman cements, and are prepared from the septaria found in the line and London clays. Artificial cements of this character are made by calcining carbonate of lime and fine river mud together. Portland cement is made in this way. Keene's coment is obtained by recalcining gypaum which has been once burnt, and afterwards saturated with alumwater. Parian cement is made in the same way, borax being substituted for alum. Oil cements, consisting of lime, powdered tiles, litharge, and oil, were formerly much used; but they do not stand the London atmosphere, nor have they any powers of resisting force. Temporary cements are used by different workmen for holding their works while in progress. Thus, in lensgrinding, the glass plate is held to the tool by a mixture of resin. beeswax, and whiting. In joining gas-pipes, white or red lead, ground with oil, is used. Electric cement is composed of 1 of beeswax, 5 of resin, and 1 of red ochre. For engineering works, a mixture of two ounces of sal ammoniac, one ounce of sulphur, and sixteen ounces of iron filings is made, and when required for use, it is mixed with twenty parts of iron borings or filings, and made into a paste with water, and applied immediately. A sulphide of iron gradually forms, making the joint as strong as the iron of which the parts are composed. A good coment for mending china is made by mixing fresh plaster of Paris with white of egg and applying it immediately. White lead, carefully applied, also

answers the purpose very well. CREMITATION, se-men-tai'-shun, the process of converting iron into steel by being heated, in the form of bars, for several hours with charcoal-powder in a chest of refractory clay. The result of the operation is called blistered steel, from the appearance of the surface. (See IBON and STEEL, and BLISTERED STEEL.)

censer was a sort of chaffing-dish with or without a censer was a sort of chafing-dish with or without a handle, and probably of various forms. Josephus tells us that King Solomon made 20,000 gold censers for the temple of Jerusalem to offer perfumes in, and 60,000 others to carry fire in. Censers were also much used by the Greeks and Romans, being by the former termed thumisterion, and by the latter thurbulum. They are still used in the service of the Roman Catholic church. Censors, sent'senv (Lat. censee, I take account of), two officers entoug the ancient Romans, first appointed by the stith king of Rome, Servius Tullius. After the abolition of the monarchy, the office of censor was held by the consuls: Special magistrates were ultimately elected: these were all patricians until 351 B.C. when

elected : these were all patricians until 351 B.C., when Caius Marcius, a plebeian, was elected. A decree was afterwards issued, which enacted that one of the was afterware issued, which entered that one of the two censors should always be a plebeian. The duties of the censorship were,—to take the census and register the property of the Roman people; to superintend and watch over the public morality, and administer the public finances. The office was looked upon as the public finances. The office was looked upon as the highest in the state next to the dictatorship, and was originally held for the term of five years, but afterwards only for a year and a half. The decisions of the consors were received with much reverence.

As the regulators of public morality, they exercised absolute powers, which were much dreaded. In time these powers were extended from public investigation to private, and the censors could inflict disgrace on any person whose conduct they disapproved of, either in regard to business or domestic matters. In the regulation of the public treasury they took upon them-selves the collection of all taxes, rates, and tithes; they also prepared the budget or statement of the

CENSORBHIP OF THE PRESS denotes that kind of examination by government officials, to which printed publications are in some countries subjected, previous to their coming before the public. Soon after the invention of printing, the Church became aware of the dangerous character of the mighty power that had sprung up. The priests felt that the diffusion of know-ledge would be destructive of their influence over the people; and hence they exerted all their power against it. They endeavoured first to prohibit the reading, and afterwards they placed restrictions on the printing of books. An ecclesiastical superintendence of the press was introduced in 1470 and 1496; but was more completely established by bull of Leo X, in 1515. In this the bishops and inquisitors were required to cannine all books before they were printed, and thus to prevent the promulgation of heretical opinions. This principle of censorship the Church of Rome still adheres to, and enforces in all countries where she has the power to do so. For the benefit of those countries in which she had not the power to enforce her wishes, indices were prepared of such books as were not to be read under penalty of church censure. The Index read under penaity of church censure. In a macx Librorum prohibitorum was commenced by the council of Trent (1540). For works of an established character which cannot well be prohibited, there is an Index Expurgatorius, denoting that they are only to be read after being corrected or expurgated. In those countries where Protestantism established itself, a censorship of the press was also maintained, but in a more modified form. In England it was the practice to license books form. In England it was the practice to herense books to be printed, the licensing power being chiefly monopolized by the bishops. Hence, we frequently see the word Imprimatur (let it be printed) on old books. It was abolished in this country in 1694, and now any work may be published; but the parties concerned will be amenable to law if it contain anything illegal or libellous. There are different modes of censorship; but the more common are when the MS, has to be subbut the more common are when the MS. has to be submitted to the examination of a public officer or licenser, who deletes any objectionable passages, or when the work is examined after being printed, and found to contain anything objectionable, its sale is prohibited, and the author or publisher liable for prosecution. (See Press, Liberty of The.)

Censers, seri-share, is a judgment condemning some book, action, or person. Ecglesiastical censers is a spiritual punishment inflicted by some ecclesiastical judge, whereby a Christian is deprived of communion with the

the accordatal office. These censures are excommun tion, suspension, and interdict.

CRNSUS, sen'-sus (Lat. census, from censes, I to value, or esteem), denotes an enumeration of people, such as is now made at stated periods in most of the countries of Europe. The practice of numbering the people appears to have prevailed in certain countries from a very early period. We are told that about 600,000 men of Israel went up out of Egypti, besides women and children, and there is reason to believe that they had borrowed the practice from the Egyptians, among whom they had been living. At a later period, David incurred the anger of Jedovah by numbering the people. Joab and the captains of the host were employed to do this work, and it occupied them nine months and twenty days, the number of valiant men in Israel being 800,000, in Judah 500,000. In these early times, the object of numbering the people people, such as is now made at stated periods in i In these early times, the object of numbering the people was chiefly to ascertain the number of fighting men that could be brought into the field; and hence we find that no account is taken of women and children. At a later period, among the Greeks and Romans wealth comes to be regarded as an important principle in the state, and the census was taken more for ascertaining the wealth of the people, in order to adjust the rights duties of citizenship among the different classes. Previous to the time of Solon, a citizen's rights at Athens depended upon his ancestry; but that lawgiver subdepended upon his ancestry; but that lawgiver antituted property for birth, and made a citizen's rights and duties dependent upon his property. Accordingly, all the citizens were divided into four classes, according to their annual income. By the laws of Servins Tullius, the Roman citizens were divided into six classes, according to the amount of their property. The Roman census was taken with great care, and was very minute and full. It indicated not only the number and respective classes of all free persons, but their domestic position as husbands and wives, fathers and mothers, soms and damenters. The census which at first was sons and dauguters. The census, which at first was employed to ascertain the military strength of a people, and afterwards their wealth, may now be said to have in view the much more important object of ascertain-ing, in its widest sense, the social condition and pro-gress of a people, with a view also to finding out those conditions, physical and moral, upon which social pro-gress and well-being depend. It is not a little remark-able, that the first census of this country dates only from the beginning of the present century (1801). Previous to that time, the most vague ideas prevailed as to the amount of its population. Since then a census of the people has been taken decennially, and much valuable information has in this way been collected as to the age, rank, sex, condition, &c., of each person. The last census was taken on 7th April, 1961. and gave the total population of the United Kingdom and gave the total population of the United Kingdom as 29,334,788. A schedule was left at each house on Saturday, 6th April, and called for on Monday, the 8th, to be filled up, with particulars of every person who passed the night of Sunday in the house. No fewer than 44,431 enumerators were employed in distributing and collecting the schedules, besides 4,249 superintending officers, and the Custom-house officers and others employed to enumerate persons in vessels. In other countries, the pariod between the taking of In other countries, the period between the taking of each census varies generally from three to ten years; being three years in Prussia and Austria, five years in France, and ten in the United (?) States of America.

CENT, sent (Lat. centum, a hundred), is a term frequently used in commerce to denote a centum rate or ratio, being so much per hundred. Thus per cent, profit or loss upon a transaction impath that the amount of profit or loss is in the proportion of £5 on every £100. This rate is termed the per-centage. Cent every £100. This rate is termed the per-centage. Cent is also the name of certain small coins in various countries, being the hundredth part of other coins: thus in the United States the cent is the 750 part of sideling, or about one halfpenny English; in France the cent is 750 part of a franc, about 750 for penny English; and in Holland the cent is 150 part of the guilder, or 1 of a penny English; and

(See PRESS, LIBERTY OF THE.)

CRESCER, sen'-share, is a judgment condomning some book, action, or person. Explosure, is a spiritual punishment inflicted by some ecclesiastical judge whereby a Christian ia deprived of communion with the Church, or a clergyman prohibited from exercising that of a man, the lower that of a horse. They are

#### Centaurus

believed to have been skilful borsemen, and the fable probably arose from the man and horse being mistaken for one animal. Their chief occupation was bull-hunt-ing; whence they received their name. They are cele-brated in Greek mythology on account of their war with the Lapithse and their contest with Hercules.

CENTAURUS, sen-tor'-us (Lat., the Centaur), a con-atellation in the southern hemisphere, between those of Lupus and Ara; it contains about thirty-five stars, one

of which is of the first magnitude.

CENTILOQUIUM, sen-ti-lo'-kwi-um (Lat.), is a term applied to collections of one hundred sentences or sayings; as the Centiloquium of Hermes, containing one hundred aphorisms or astrological sentences talsely ascribed to HermesTriemegistus, and the Ceutiloquium

of Ptolemy, a famous astrological work.

CENTIFER, sen'-to-pede (Lat. centum, a hundred; pedes, feet), (Scolopendru), a gon of carnivorous Annulose, distinguished by possessing antennes of four-teen joints or upwards; a mouth composed of two mandibles, a quadrifid lip, two palpi or small feet, united at their base, and a second lip formed by a second pair of dilated feet joined at their origin, and terminated by a strong hook, having an opening beneath its point, through which a strong poison is rjected. In the West-India islands and the hetter parts of America the centipede is regarded very seriously as a pest. They attain a length of five or six inches, and very frequently find their way into beds. They will endearour to escape when a light is brought into the room, but, if molested, will turn and bite, the bite immediately producing inflammation and fever. The common English centipede, however, is a harmless thing, not exceeding an inch in length, and for the most part hiding under the decayed bark of trees and among old lumber.

CENTO, sen'-to (Gr. kentron, a thing of patches), is a literary composition formed of verses or passages from one or more authors, disposed in a different order, and arranged so as to bring out a different meaning. Considerable dexterity was frequently displayed in the combining of passages of different authors so as to form a regular and connecting whole. Thus there were in early times Homero-centones and Centones Virgiliani. It was also a fuvourite amusement in the

Middle Ages.

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CENTRAL CRIMINAL COURT, sen'-tral, a court established in 1834 for the purpose of trying cases of treason, murder, felony, and misdemeanour committed within the city of London, the county of Middiesez, and parts of Essex, Kent, and Surrey. It is also authorized to try offences committed on the high seas and other places within the jurisdiction of the Admiralty of England. The court of Queen's Bonch may also order a certain class of offenders to be tried here. The area over which the jurisdiction of the Central Criminal Court extends is nearly one bundred and thirtieth part of the area of England and Wales; but the proportion of population is only one-seventh, when compared with that of England and Wales. The district included in the jurisdiction, and mentioned above, is, for all purposes under the act by which it was established, considered as one county, and in all indictments and presentments the venue rans, "Central Criminal Court to wit." The judges rans, "Central Criminal Court to wit." The judges may be selected from a very extensive list. They may insist of any two or more of the following persons: the lord mayor of the city of London for the time being, the lord chancellor, the lord keeper of the great seal, and all the judges of her majesty's courts of Queen's Banch, Common Pleas, and Exchequer, for The time being; the chief judge and the two others in Bankraptcy, the judge of the Admiralty, the dean of the Arches, the aldermen of the city of London, the recorder, the common serjeant, the judges for the time being of the Sheriff's Court of the city of London, and being of the Sheriff's Court of the city of London, and sany person or persons who hath, or shall have been lord chancellor, lord keeper of the great seal, or a judge of any of her majesty's superior courts at Westminster; together with such others as her majesty, her heirs and successors, shall from time to time name and appoint by any general commission. On account of the extent of this int, it is found unnecessary to issue a commission every time the sessions are held; and the period of holding the sessions is not interrupted 474

#### Centring

when the judges of the Westminster courts are on cir-cuit. At the Old Bailey, and the New Court adjoining, the sessions are held twelve times a year, and the judges generally selected are two common-law judges and the recorder of the city of London. The sheriffs of the city of London and of the counties of Middlesex, Essex, kent, and Surrey, susanon the jurors according to the district in which they live. Jurors from Essex, Kent, and Surrey, who have served upon any jury at this court, are exempt, during the ensuing welve months, from serving upon any jury in any court held in the county in which they reside, except the sessions of the

CENTRAL FORCES are those forces which cause body in motion to tend towards or recede from the centre of motion. The first law of motion is, that a body must continue for ever in a state of rest, or in a state of uniform and rectilineal motion, if it be not disturbed by the action of an external cause. Upon this law the doctrine of central forces is founded. It therefore considers the external forces which act upon a body in motion when there is an alteration either in its velocity or direction round a central point. It also considers the law of the force by which a body moves round another in a known curve, and solves various mathematical problems. Gravity, as exemplified in the force which acts on all bodies from the centre of the earth, is the simplest and most general example of a central force. Kepler and Newton gave much time and labour to the study of central forces.

CENTEALIZATION, sen-trall'-i-sai-shun (Gr. kentren, a point, the centre), denotes generally the bringing or reducing to a centre or within small compass, and is frequently applied in politics to the tendency to bring together all the departments of state administration to one centre,-to remove all local offices to the capital.

CENTRE OF GRAVITY, sen'-ter, a term employed to denote a certain point in the interior of a body, or system of bodies rigidly and invariably connected, so situated that any plane whatever which passes through it divides the body into two segments of equal weight.

CENTER OF GYRATION is that point in a rotating body, or system of bodies, at which, if the whole mass were collected, a given force applied would produce the same angular velocity that it would have commu-nicated to the system in its first condition.

CENTER OF MAGNITUDE OF FIGURE is that point in plane figures and curved surfaces where, supposing their areas had weight, they would balance themselves. Thus, the centre of magnitude of a circle would be its own centre. The same term is applied to any point which bisects all lines that pass through it, and are terminated by the circumference

CENTRE OF OSCILLATION is that point in a body oscillating about a fixed axis, into which, if the whole mass were collected, the body would vibrate through a given angle in the same time as in its first condition.

CENTRE OF PERCESSION is that point in a solid body. r system of bodies, into which, if the whole mass were collected, the greatest possible effect could be produced by striking it against another body. It may also be defined as a point in the axis of a moving body at which, when striking an immorable obstacle, the body rests in equilibrio, without inclining to either side or acting on the centre or axis of suspension.

CENTER OF PRESSURE of a fluid pressing against a surface, is that point at which, if a force equal to the pressure were applied in an opposite direction, the sur-

face would remain at rest.

CENTRIFUGAL FORCE, sen-triff-u-gil (Gr. kentron, centre; Lat. fraio, I see), is the force that urges a revolving body to fly off in a straight line instead of describing a curve. The moon is held in her orbit round the earth by centripetal force, and a stone flies from a sling by centrifugal force.

CENTRING, OF CENTERING, sen'-tring (Gr. kentron, the centre, a point), a term used to denote the frame-work on which the bricks or stones that are used to form an arch or vaulted roof are supported during the process of construction. For small arches, such so those of doors and windows, it simply consists of two boards cut to the required shape, and kept spart by slips nailed to the edge of each, which correspond in slips nailed to the edge on each, which correspond in length to the thickness of the wall in which the arch is placed; but for bridges with arches of great span and

## Centripetal Force

breadth, a more elaborate system of framework is required, which must be put together in such a manner that it will offer a sufficient resistance to the weight placed upon it without bending perceptibly beneath it, and that it may be readily taken away when the architecture when the same to account the contract of the state of the same to account the same transfer of the same transfer is completed, care being taken to avoid giving heavy blows in removing it, which may shake and injure the fresh masonry. (See BRIDGE.) In building arches of brickwork or small stones, the trames are placed five or ornework or small stones, the trames are placed five or six feet apart, and tied together with braces, and on these thick narrow planks are placed, fitting closely together to support the bricks; but when large stones are used, close boarding is not required, and they are supported on what are technically called "laggings." When the span is of great size, the centering consists of a great number of vertical frames or trusses, disor a great number of vertical range of a tusta, us-posed in such a manner as to offer effectual resistance to the strain that is brought to bear on them in the direction of their length; and these frames are strengthened with horizontal beams and cross braces, the whole forming a rigid network of timber. making frames for centerings, it must be carefully contrived that the load shall not act in a direction transverse to the grain of the wood that is used; the pressure must, therefore, he carried throughout the length of the beams, some of which, in the usual method construction, are directed against the abutments which are to support the arch, and sustained by them, and others which tend in an inward direction, towards the centre, are supported and prevented from yielding by the longitudinal pull of other beams that cross them obliquely. Shoes of cast-iron, that receive the ends of the beams, are used in modern centerings to obviate the necessity of making tie-joints, which weaken the beams. Care must be taken to prevent the centering from rising at the crown, which it is liable to do if it be not skilfully made, on account of the weight of the haunches of the arch tending to push the crown upwards. The centering used for Waterloo bridge, designed by Rennie, is one of the best examples in which the frames are supported by the abutments only. In building Chester and Gloucester bridges, Mr. Harrison, the engineer of the former, supported his centering on temporary piers built in the bed of the river; while Telford, who built the latter, supported his on piles. Flexible centres, so called because the timbers of which they are composed can move freely on one another, are seldom used in the present day, because they invariably rise at the crown from the weight of the they invariantly use at the crown from the weight of the haunches, and the regularity of the curvature of the arches cannot be relied on. The arches of the beautiful elliptical bridge of Neuilly, built by Peyronnet, were constructed on centerings of this description.

CENTHIPETAL FORCE, sen-trip-e-tät (Gr. kentron, centre; Lat. peto, I seek), is the force by which a body in motion is kept revolving round a central point, in-

etead of flying off at a tangeut to its orbit. CENTUARY. (See ERYTHERA, SABBATI. (See ERYTHERA, SABBATIA.)

CENTUALIS OF MACHINEUR, sen'-tu-recs, the name of the first great Protestant history of the Church, and is so called from being divided into centuries, each volume taking up 100 years, and from Magdeone volume taking up 100 years, and from auguer-burg, the city where it was prepented. It was prejected by Matthias Flacius, about 1552, and the first volume was published at Bale in 1559. Thirteen volumes have appeared, bringing the history down to 1300. It is a work characterized by great judgment, learning, and fidality. Each confurer is treated under sixteen and fidelity. Each century is treated under sixteen distinct heads or chapters, viz.:—1. General View of the Period; 2. Extent and Propagation of the Church; 3. Persecution and Tranquillity of the Church; 4 Doctrine; 5. Heresies; 6. Rites and Ceremonies; 7 Government; 8. Schisms; 9. Councils; 10. Lives of Bishops and Doctors; 11. Heretics; 12. Martyrs; 13. Miracles; 14. Condition of the Jews; 15. other Reli-gions; 16. Political Condition of the World. In the preparation of the work there were five general directors and ten paid agents, seven of whom, well-informed students, were employed in collecting materials; two of greater learning and experience arranged the mat-ter thus collected, and submitted it to the directors

### Cerasus

Cinchonarea. The annulated root of C. treasmanhs is the officinal presecuants of the British pharmacopoiss. It is known as true, assaulated, Brasilian, or Lisbon ipecacuants, and is the only sort cons monly met with in this country. It is collected in all seasons of the year, but chiefly from January to March, and is imported from Rio Janeiro, Bahia, and Pernambuco. When given in large dose, it acts as an emetic and as a purgative: in small doses it is expectorant and diaphoretic. Its peculiar properties are principally due to an alkaloid called emetima.

CRPHALASPIS, sef-ü-lüs'-pis (Gr. kephale, head, aspis, shield), in Geol., the Buckler-head, a fish of the lower Old Red Sandstone or Devonian period, so called from having the bones of the head united into a single shield-

like case.

CEPHALIC, se-fall-ik (Gr. kephalikos), is applied to something pertaining to the head. Thus, cophalic medicines are such as are administered for disorders of the head.

CEPHALITIS, sef-ä-li'-tis (from Gr. kephale, the head), in Med., inflammation of the brain. (See BRAIN,

DISEASES OF THE.)

CKPHALOPODA, sef-d-lop'-s-dd (Gr. kephale, head; pons, foot), a class of molluscous animals, more highly organized than any other, presenting undoubted rudinents of an internal skeleton, and containing secretive, digestive, respiratory, and generative organs. They are also distinguished by the possession of locomotive organs around the head in the shape of prolonged tentacula, which project forward and more or less conceal the mouth.

CREHLUS, se'-fe-us, a constellation of the northern hemisphere, midway between the Polar star and Cyg-nus. The principal stars in this group are of the third magnitude only.

CEPI CORPUS, sc'-pi kor-pus, is a return made by a sheriff upon a capias, or other process to like purpose, that he hath taken the body of the party named in the process, as he was thereby commanded.

CEPOLA, sep-o'-ld, a gen. of fish, the bodies of which are much compressed and clongated.

CERAMBYCIDE, se-ram-bit-se-de, a family of coleopterous insects, distinguished by the inordinate length of their antenne. Generally they are of elegant form, and are found in forests and woods, on the trunks of trees, but rarely on flowers. Some of the exotic species are remarkable for emitting after death a scent something like attar of roses. The only scented Cerambyeid known in England is the musk-beetle (Cerambyx moschatus). It is about an inch long, and of a fine green colour. It is found on willows in the neighbourhood of London. There is a very splendid collection of these insects in the British Museum.

CERASTES, se-rāz'-less (Gr. kerastes, horn), a snake distinguished by two horny protuberances on its head, and hence known as the borned snake. It is said to exist almost entirely without water. It is found in

Libya, Arabia, &c.

CERASUS, ser'-d-sus, in Bot., a gen. of trees be-longing to the nat. ord. Rosacce, sub-ord. Amygdales. Several species or varieties of this genus produce the well-known fruits called cherries. The varieties usually cultivated in our gardens are supposed to have been derived originally from two wild species, C. avium and vulgaris. Both have white flowers in clusters or nearly sessile umbels, and both are generally regarded as natives of Britain and of the middle and south of Europe. The timber of C. avium is valuable for the purposes of the cabinet-maker, turner, and musical instrument maker; the straight small branches are used for making pipe-stems, and the leaves have been used as a substitute for tea. The bark of the species C. capallin possesses astringent and febrifugal proper-ties; that stripped from its root is used in Mexico as a remedy against dysentery. The leaves of C. capri-cids contain so much hydrocyanic (prussio) acid as to prove poisonous to cattle that feed upon them. Most parts of the species C. Lauro-carasus, the cherry-laurel, Most but especially the leaves and seeds, are poisonous. The in copy of the whole.

Carnains, sef-a-e-lis (from Gr. kephale, head), the leaves evolve a variour which is destructible to the Bot., a gen. of plants belonging to the nat. ord. insect life: hence some gardeners make use of these states.

leaves for killing blight. Cherry laurel water, obtained leaves for killing ought. Oberry-leaves water, to use the distilling the leaves with water, is used medicinally for similar purposes as hydrocyanic acid. The plant is common in our gardens, and is popularly known as the "saurel," though it is not a member of the true laurel family. The kernels of the species C, occidentalis, a native of the West Indies, and others, are used to the west indies, and others, are used. its, a native or the west and the succes, and concern the purpose of flavouring liqueurs, such as cherry-brandy, Kirschenwasser, Maraschino, and Noyeau. The species C. Padus, or bird-cherry, has similar properties, though less powerful, to those of the cherriaurel. Q. sirginiana, the choke-cherry, has astringent and febrifugal properties, and its fruits are commenly raixed with penumican in North America. C. scrotina, the wide or black cherry of the western states of America, is a beautiful and useful tree. The cherries are sometimes eaten, but are not very palatable. The wood is esteemed by cabinet-makers, having a close grain, and taking a very high polish. The inner bark forms and taking a very high polish. The inner bark forms prescribed of late in America, and which is just beginming to receive the attention of European practitioners. It is used as a tonic instead of cinchons, and as a sedative for the alleviation of general and local irritation. It is taken from any part of the tree, but preferably from the root. It has a lively einnamon-colour, and. when fresh, a characteristic odour, like that of bitter almonds.

CHRATIN, se'-rd-tin (from cerasus, the scientific name of the cherry-tree), the portion of the gum of the cherry-tree which is insoluble in cold water.

CERATONIA, ser-à-to'-ni-a, in Bot., a gen. of leguminous plants of the sub-ord. Cesalpiniez. The most important species is C. sitiqua, the ripe fruit of which is known under the names of carob, locust, St. John's bread, and Algaroba bean. Its pulp has a very sweet taste, and is supposed to have been the food of St. John the control of the control of

taste, and is supposed to have been the food of St. John in the wilderness. The fruit is now largely imported into this country for making cattle-food.

CERITOPHYLLACEE, se-rā-to-fil-lai'-se-e, in Bot., the Hornwort fam., a nat. ord. of dicotyledonous plants in the sub-class Monuchlamydee. There is but one gen., Ceratophyllum, the species of which are aquatic herbs, with verticillate leaves and minute monoccious of the post part of the post part of the protection of the post part of the protection of the post part of the post part of the protection of the post part of the protection of the post part of the protection of the protection of the post part of the protection flowers, natives of the northern hemisphere. properties and uses are unknown.

CERDON, ser don, an ancient sect of heretics, so called from one Cerdon, who flourished at Rome about A.D. 140.

CEREBELLUM. (See BRAIN.)

CREERIC ACID, ser-e-brik (Lat. cerebrum, brain), an soid of a peculiar character found in the brain of animals, partly uncombined, and partly in the form of cerebrate of sods. It is a white solid, of a fatty nature, and may be obtained in crystalline grains, which are coluble in boiling alcohol and ether, but insoluble in cold ether. It is insoluble in water, but swells up when left in that liquid for several hours. This acid was formerly called Cerebrin. The component parts of cerebric acid are in 100 parts :-

Carbon	66.7
Hydrogen	10 6
Nitrogen	2.3
Oxygen	
Phosphorus	0.9
	100.0

CEREM, se'-rem (Lat. cera, wax), a solid waxy body obtained from beeswax, which is supposed to be identical with parafilm.

CEEEMERTS, eere'-ments (Lat. cera, wax), were clothe dipped in melted wax, with which dead bodies were cafolded when they were embalmed.

Chermonies, Mastre of the source instituted by James I. to attend to the proper presentation of ambassadors, and other persons of quality, to the sovereign. The gentleman filling this office is necessarily a person of good address and master of several languages. He attends at court on all occasions of state ceremonial, and has under him an assistant master, or deputy.

CERRMONY, ser'-e-ma-ne (Fr. córémonie; Lat. care-

monia), is applied to certa n forms or rites by which an act is rendered more grand or impressive. Ceremonies may be said to be of four kinds:—1. social; 2. sucred;

3. state; 4. international. Social ceremonies will be noticed under Errqueite, and state ceremonies under such heads as Coronation, Presentation, Opening OF PARLIAMENT, &c. Sadred reremonies are defined to be "the external rites and manner in which the ministers of religion perform their sacred functions." In respect of ceremonies there is a very marked difference be-tween the old dispensation and the new. The former, or Mosaic dispensation, abounds with rites and cere-monies; the latter, or Gospel dispensation, is remark-able for the want of them. In what may be termed the childhood of the human race, numerous stringent luws and regulations are laid down for their guidance, and sensual representations are employed to make a deeper Under and more lasting impression upon the mind. the Christian economy, when men may be said to have been set free from a state of pupilage, his mode of worshipping the Creator was left very much to himself, and he was taught to seek within himself for those directions by which he might best attain a holy life and fulfil his high destiny. The great gospel law laid down on this subject was, "Let each be persuaded in his own mind, and so let him act." How far rites and ceremonies of human appointment may be employed in the worship of God is a very important question, and one which has given rise to much discussion. Of the two great sections of the Christian church, the Roman Catholic and the Protestant, the one is characterized by its attachment to, the other by its rejection of, human rites. One great peculiarity of the Christian religion is its striking adaptation to fallen human nature. Its laws are founded upon the necessities of our nature. The highest said purest worship of God is undoubtedly that of the heart; but in man's present infirm and imperfect condition, the heart may be greatly influenced by the senses; and hence the proper object of all religious rites and ceremonies is to mpress and elevate the heart through the feelings. All religion must in some measure be dependent upon external forms; and so high an anthority as St. Augustine declares that "no religion, either true or false, can subsist without some ceremonies." The great difficulty is to determine the length to which it is proper to go in accommodating religious ceremonies to weak human nature. When, from being a means of worship, they come to be regarded as worship itself, they are worse than useless, they are permittous. The Roman Catholics may have gone too far in this direction; but the majority of Protestants seem to have fallen into the other extreme, and to pay too little regard to the externals of religion. But we believe that no general rule can be laid down on this subject, outward rites and ceremonies being much more necessary to some than others. The great rule is for each to be persuaded ir his own mind as to what is best for him, and to act accordingly. It has been frequently remarked that there is a striking similarity between many of the Jewish ceremonies and those of the ancient Egyptians; and many have been of opinion that Moses adopted many of them from the Egyptians. This may probably have been the case; and we are also told that many things were permitted to them, on account of the hardness of their hearts. There can be no doubt that many of the cremonies of the Church of Rome were borrowed from the heathens. International ceremony.—Among independent states there exists a sort of international etiquette, according to which certain marks of respect are shown to the states, their rulers or representatives, by other states, and a certain rank or dignity accorded to them. In Europe, in the Middle Ages, frequent disputes took place among the rulers or representatives of the different states, on the subject of precedence. Claims for precedence were advanced on various grounds; as on the form of government, the number of crowns, the titles, achievements, extent of possessions, antiquity of their family, or the length of time that Christianity had been established in their dominions. At the congress of Vienns, issued in their dominions. At the congress of vienns, the question of rank among the different powers was discussed, and a commission appointed with the view of settling it; but as no agreement could be come to, the matter was allowed to drop. Rulers of equal dignity, when they make visits, concede to each other the precedence at home; at other times they travel incognition of dependence of the control of th nito, or do not appear on public occasions, or do so

Chros

Cession

with a reservation respecting their dignity. Emperors and kings style each other "brother," while they call princes of less degree "cousin." To international ceranonies belong—1. Titles of rulers; 2. acknowledgment of the title and rank of rulers; and 3. marks of respect conformable to their rank and title.

CREES, se'rees, one of the asteroids that revolve between the orbits of Mars and Jupiter. It is the first of this group of minor planets in order of discovery, and the largest of them, with the exception of Vesta. It was first observed by Pinzzi, an Italian astronomer, at the observatory at Palermo, in Sicily, January 1, 1801. The elements of its orbit were calculated by Gauss. It derives its name from Ceres, a heathen goddess that derives its name from Ceres, a heathen goddess that was the object of especial worship in Sicily.

CERINTHIAMS, se-rin'-thi-ans, the followers of Cerinthiams, were among the earliest of the sects of heretics that sprang up in the Christian church, Cerinthus, according to some, was a contemporary of the apostic John; according to others, he lived in the 2nd century. He was a Jew, and studied philosophy at Alexandria; but the greater part of his life was spent in Asia Minor, where he promulgated his heretical doctrines. What the exact nature of these were it is difficult to say, for the accounts given of them are various and contradictory; but they seem to have much resembled, if they were not identical with those of the Gnostics. (See GNOSTICS.)

CRIUM, se'-ri-um, symbol Cc, equivalent 47, a very rare metal, existing in allanite, cerite, and cerine. It is only known as a grey powder, which becomes lus-trous on being burnished. It forms two oxides,—the protoxide and peroxide, which form a few salts of no importance or interest. They are said by Rumnels-berg to be isomorphous with those of cadmium.

CERCLEIN, ser-o-leen, a greasy body found in beeswax, to which its colour, odour, and tenseity are due. It has an acid reaction, and fuses at 83°. It is soluble in ether, and is but imperfectly known. It is obtained by macerating the wax in cold alcohol, which retains it in solution.

CEROTIC ACID, esr-ot'-ik, an acid contained in varying quantities in beeswax. It is obtained by dissolving the wax in hot alcohol and crystallizing. Genuine beeswax contains about 22 per cent. of cerotic acid. Heated with potash, it produces cerotate of potash and

ceroic alcohol.

Chroxylon, scr-ox'-e-lon, in Bot., a gen. of palms. The species C. audicola yields wax, which is applied to many useful purposes. It is a native of South America.

CERTAINTY, CERTITUDE, ser'-tain-te (Lat. certum, from cerno, I perceive), is applied primarily to the state of a person's mind when he feels sure or convinced of anything; but is also applied to the truths or events respecting which this conviction may be entertained. Certainty is *physical* when it is according to the laws of nature; *moral* when in accordance with the common order of things and the received opinions of mankind; and metaphysical when springing from intuitive beliefs, as the first principles of natural law. According to the mode in which it is attained, certainty is immediate when by sense or intuition, or mediate when by reason and demonstration. Some philosophers have made sense the measure and ground of certainty; others reason; and others, as Descartes, self-consciousness.

CERTIFICATE, ser-tif'-e-kait (Fr. certificat, from Low Lat. certus, certain; facto, I make), a testimony in writing as to the truth of a fact, or number of facts. writing as to the truth of a fact, or number of facts. Certificates, for a variety of purposes, are recognized by the law of England. Among these may be mentioned,—the annual certificates of attorneys (see ATTORNEY); a bankrupt's certificate of conformity; the certificate of appointment to a bankrupt's estate and effects, granted to the creditors' assignees; the certificate of counsel, in order to enable a client to litigate in forma pauperis; the certificates of the judges belouging to the higher common-law courts at Westminster, ing to the migher common-law courts at Westminster, granted for various purposes; and the certificate of the registry of a ship granted by the collector, compttoller, or principal officer of the custom-house at the port of registry. This last certificate is held by the captain as a voucher of the character and privileges of his ship as Battish years. his ship as a British vessel.

CERTIORARI, ser'-ti-o-rai'-ri (Low Latin, certioro),

is a writ issued out of the court of Chan-a superior court of the common law, dirthe queen's name to the judges or officers of infe the queen's name to the judges or officers of sistence courts of record, commanding them to return the record of a cause or matter depending before them, to the end that the party may have the mine sume and speedy justice. It may be had either in ordinal or civil cases, unless it be taken away by the express words of some set of parliament, which is very frequently the case where the statute gives jurisdiction to justices of the peace over criminal offences, and in other matters. In criminal cases the court of Queen's Bench has a superinandance over all infestions. Bench has a superintendence over all inferior courts, and may remove the indictments or other proceedings therein depending, and transfer them to its own jur diction. The object of the writ is to obtain relief from some inconvenience supposed in the particular case to arise from a cause being allowed to proceed to trial before an inferior jurisdiction, less capable than the superior court of rendering complete and effectual justice, or to quash the orders or proceedings of such inferior jurisdiction. The most usual instances in which the writ is granted in criminal cases are,—1. To consider and determine the validity of indictments and the proceedings thereon, and the finding or verdict of a jury on coroners' inquisitions, and to quash or confirm them as there is cause. 2. Where it is surmised that a partial or insufficient trial will probably be had in the court below, the indictment is re-moved, in order to have the prisoner or defendant tried at the bar of the Queen's Bench or before the justices at Nisi Prius, or at the assizes: 3, in order to plead the royal parcon; 4 to issue process of out-lawry against the offender in those counties or places where the process of the inferior courts will not reach him; 5. to remove orders of justices in quarter or petty sessions, for the purpose of having them quasiled. It is also issued when peers are indicted for treason or felony, or for misprision of either, but not for any other offence. Under the writ the indictment is removed into the court of the Lord High Steward of Great Britain, in order that the defendant may be tried by brish, in order that the detendant may be tried by his peers. A certiorari to remove an indictment may be granted at the instance of either the prosecutor or defendant; but before it be granted to say person (except the attorney-general), the application for it must be by motion made in the Queen's Bench, or before a superior of the control of the c before some judge of the court; and where the appli-cation is made by a defendant, he must, before the writ is issued, enter into a recognizance before a judge of the Queen's Bench, or a justice of the peace, in such sum and with such sureties as the court or a judge may direct, to defend the indictment, and appear to receive

judgment if he be found guilty. CEBUSE. (See LEAD, CARBONATE OF.)

CERVIDE, ser-vi-de (Lat. cervus, a deer), the Stag

CENVIDE, ser\*-vi-de (Lat. cerus, a deer), the Stag or Deer class of animals, a gen. of quadrupeds belonging to the order Pecora. The generic character is solid horns, covered, while young, with a hairy skin growing from the top, naked, anumal, and branched. There are several species of the Cervidæ. (See Deer.) Cressavit, ser-sai\*-vil (Lat., he hath ceased), was a writ which anciently lay by the statutes of Gloucester and Westminster 2. When a man holding lands of a lord by a rent or other services, neglected or ceased to perform his services for two years together, or where a religious house held lands given to it on condition of performing some certain spiritual service, as dition of performing some certain spiritual service, as reading prayers or giving alms, and neglected it,—in either of which cases, if the cesser or neglect had continued for two years, the lord or donor, and his heirs, should have a writ of cessanit to recover the land itself; eo quod tenens in faciendis servitiis per biennium iam cessavit.

CESSIO BONORUM, ses'-si-o bon-o'-rum (Lat., cession of goods), in Scots law is a process by which an insolvent surrenders his property for behoof of his creditors, and is, in consequence, set free from prison or obtains pro-tection. The insolvent, however, is not, as in seques-tration, discharged from his debts, for which his goods may be again attached at any future time; his person only is protected from any future proceedings for past

CRESTON, seek'-un, in Eccl. matters, is applied to the voidance of a benefice or dignity in the church, arising

#### Cestui que Trust

from the accepting of another, which is by law incompatible with it. This voidance takes place, ipeo facto, upon the acceptance of the second benefice, and the patron may at once, without any express resignation present a new incombent and require his admission.

CESSUI QUE TRUET, set -b-ke-trust', is the person for whose benefit a passive, or active, or special trust is designed, and reposed in some other person to execute, and his interest is described as a trust estate; which distinguishes it from a use on the one hand, and from lead setate on the other (See Turst).

from legal estate on the other. (See Tausr.)
Castur Qua Uass is one who has the beneficial ownerstip or me of land, the legal seisin or feudal tenancy
of which is in another, either by express declaration or
deed, or by implication, from the nature of the conversame titled! (See Uass.)

veyance itself. (See Usns.)
OBSTUL QUE VIE, set'-a-ke-ve, is one for whose life

any lands or tenements are granted.

Observe, see'-tue (Gr. kealos, embroidered), a fine embroidered girdle worn by the Greek and Roman women close under the breasts. It was distinct from the sone, which was worn round the loins. Homer asserbes the power of charming and conciliating love to the cestus of Venus, which was covered with alturing representations. When Juno wished to gain the love of Jupiter, she borrowed this girdle from Venus. The cestus, or certus, was also the name of a samplet worn by the Roman purilists. (See Chartes)

gauntiet worn by the Roman pugllists. (See Castus.) Charges, se-tai-se-a (Gr. ketos, Lat.cetos, a whale), an order of the mammalia, which differs from the rest of that class both in form and habits. In ordinary language it is generally classed with the fishes. All the ectacea have a fish-like form; but the tail fin is horizontal, and not vertical, as in fishes. It is moved by very powerful muscles, and is the great instrument of progression. There are no posterior limbs, and even the pelvis is only represented by two small rudimentary bones. The auterior limbs are in nearly all cases adapted for swimmings. The hones, however, in the ekseleton appear like those of a hand, but much abbreviated and solidified. The head is joined to the body without any apparent neck, and the upper parts of the rertebre are ankylosed or consolidated. The skin is naked, and some of the species are conspicuously whiskered. The cetacea are viviparous, and suckle their young, towards which they show great affection. They are warm-blooded, and breathe by lungs, and whale first at the surface of the water. (See Greenland)

Catragella, setrai-re-a, in Bot., a gen. of lichens, which includes the well-known Lecland moss. This lichen, which has been named C. islandiza, is officinal in the British pharmacopens, and is employed both as a nutritions food and as a mild mucliaginous tonic in catarrh and consumption. Combined with cocoa, it forms the article known as Iceland-moss cocoa, which was originally prepared by Mr. Dunn of London. Two kinds of starch are found in this lichen,—one called lichen starch, and the other inulin; also n peculiar bitter principle, which has been named cetrarin. When used for food only, the plant should be deprived of its bitterness, either by heating it twice in water to near the botting-point, or by digesting it in a weak alkaline solution, formed by adding half an onnee of carbonate of potash to about a gailon of cold water, and afterwards washing it with pure water. The species C. simulis possesses somewhat similar properties.

CEVADILLA. (See ASAGREA.)

CETLON MOSS. (See GRACILABIA.)

CHAPP- or CHAPP-WAX, tchafe'-waks, was an officer in changery who fitted the wax for the scoling of the write and such other instruments as were delivered out under the great seal, or seal of the court.

CHAPP-CUTTER, tchaff-kut-ter (Sax. ceaf, chaff; Nor.

Charm-Curren, tendy-kut-for (Sax. ccal, chair; Norcore, cut), an implement used by farmers for cutting hay and straw into small lengths. Much ingenuity has been applied to the construction of these machines, which are principally intended for the prevention of waste in feeding animals.

Charrimon, tolay fact (Fringilla calebs), one of the foot of the tree containing the bold free bird, the most popular of European song-birds. Not only in England is the chaffinch a favourite,—with the birdcatcher places his decoy, covering it overcage, handkerchief, and al—with a handful of grass. Then he is a honsehold proverb; and as among us like the birdcatcher blaces his decoy, covering it overcage, handkerchief, and al—with a handful of grass. Then he sticks the little branch on which the scaled bird is mounted into the trunk of the tree, and just with them they are said to be "gay as a challingh." above it, and at a slight angle, one or two of the

#### Chaffineb

Nowhere, however, is chaffinch enthusiasm carried to so high a pitch as in Germany. Bedestien informs us that in the kuife-making village of Ruhl the inhabitants are such great chaffinch-fanciers that they will go sixare such great challingly-language that they will go six-teen miles to catch a bird, and that on one occasion, when a peculiarly good one was in the market, a crasy fancier, whose means were at low ebb, went and sold his only cow, and bought the coveted chaffinch with the money. The plumage of the chaffinch is as fol-lows:—Fore part of the head black; back part, and extending even to the nape of the neck, blue, shading off to an olive-tinted chestnut, and again to a greygreen to the stump of the tail. and grey, and on each of the two outer feathers there is a peculiar wedge-shaped white spot. From the root of the lower half of the beak to the extremity of the under part of the body the colour is reddish-chestrut. The male may be distinguished from the circumstance of being smaller than its mate, whose length is six inches, and from the latter's under parts being dingier. chaffinch lays four or five eggs, of pale purplish-buff colour, sparingly streaked and spotted with reddish-brown. Insects are its chief food, and in the summer season it effects incalculable good by destroying myriads of aphides and caterpillars. In Italy the chaffinch is killed for the table. It is very widely spread, being found in parts of Asia, in the north of Africa, and as



HEAD OF CHAFFINGE.

far west as the Azores. The chaffinch is a very pugna-cious bird, and it is of this, its failing, that the English birdeatcher takes advantage in the profitable sport known as "pegging." First of all, the eatcher must be provided with a chaffinch that will sing loud and fearlessly in the dark and when its cage is in motion. This is effected by allowing it to remain in its dark moulting-box after the process of moulting is com-pleted, and placing in the same apartment an able singer of its own species. After a while the little prisoner will sing as cheerily as its tutor. Then its by an elastic cord. Although the consequent swinging metion seems to bother it vastly for a day or two, it grows used to it in a wonderfully short space of time, and will sing screnely with its house rocking like a ship at sea. Then its cage is tied in a handkerchief, and its trainer walks about the chamber with it swing ing in one hand; and so the teaching progresses, until the poor bird will set up its little pipes at any hour and almost in any position; then it is called a "pegging-finch," and is worth from one guinea to five. Besides one of these decays, the chaffinch-pegger must have a stuffed chaffinch mounted on a forked stick, and some pieces of whalebone furnished with a spike in one end, and thickly smeared with birdline. Thus equipped, the birdcatcher sets out in the early spring morning, carrying his decoy in his cage in a handkerchief. When the country is reached, and the decoy, all in the dark, hears the voices of its free fellows among the boughs, it breaks out, and returns them note for note as long as they please to keep the game up. By-and-by the birdcatcher marks a tree whence issue chaffineh notes the boldest and most defiant. It is said by these men (and it is their business to know) that never more han a single pair of chaffinehes live in a tree. the foot of the tree containing the hold free bird, the birdeatcher places his decoy, covering it over-cage, handkerchiof, and all—with a handful of grass. Then he sticks the little branch on which the stuffed bird is mounted into the trunk of the tree, and just

## Chailletiacee

limed whalebone twigs. Then the man retires. Mean-while the free bird in the tree, with its hen near at hand, has heard the voice of the decoy, and, trembling water, has neared the voice of the decay, and, resulting with jealous rage, has replied to, the salvos on either side becoming heavier and floreer each moment. At last the free bird, finding the mysterious stranger will not respond to the invitation to come out and fight, like a true finch, hops down in search of it. In an instant it spies the stuffed thing sitting out impudently, and, as it were, on the very steps of his castle; and, with a harsh cry, down he swoops to inflict deadly chastisement; but, has! the treacherous twigs intervene, and, halking it of its vengeance at the very moment of its consummation, hold it an ignominious prisoner till the man runs up and consigns it to the store-cage. A clever birdeatcher will thus capture from twenty to forty singing chaffinches in a single morning.

CHAILLETIACEM, shail-le-ti-ai/-se-e, in Bot., the Chailletia fam., a nat. ord. of dicotyledonous plants in the sub-class Monochlamydeæ. The only remarkable member of this family is Chailletia toxicaria, a tree growing

in Sierra Leone, producing fruit which is called ratsbane from its poisonous nature.

Chain, tshaine (Fr. chaine, Lat. catena), a series of links or rings connected or fitted into one another, usually made of some kind of metal; as a chain of gold or of iron; but the word is not restricted to any particular kind of material. It is often used for an ornament about the person.

CHAIN CUILE. (See CABLE.)
CHAIN MAIL, or ABMOUR, a flexible kind of armour made of hammered iron links connected together. was much worn in the 12th and 13th centuries, and was lighter and more convenient than armour composed of steel or brass plates. It was not, however, so complete a defence against the thrust of a lance or spear.

CHAIN RULE. (See EQUATIONS.)
CHAINS, in Mar., strong links or plates of iron, the lower ends of which are bolted through the ship's sides to the timbers. They are used in order to contain the blocks called "dead-eyes," by which the shrouds of the masts are extended; and are placed at short distances from each other on the outside of the ship. Top-chains are chains used in order to sling the lower yards in time of battle, to prevent them from falling when the ropes by which they are hung are shot away or injured.

CHAINS. HANGING IN, 8 species of ignominy frequently inflicted in former times upon the bodies of malefactors after execution. It consisted in hanging the body in chains upon a gibbet near the place where the crime was committed, and allowing it to rot there as a terror to other offenders. It was only in 1834 that a law was passed abolishing this practice in England. Chain, thair (Lat. cathedra, Fr. chaire, a pulpit), a movable scat or frame, made with a bottom of different mutailly such than the control of the control

a movable scat or frame, made with a bottom of different materials, and used for persons to sit in. The term was originally applied to the pulpit from which the priest addressed the people. The place where professors and regents in universities deliver their fectures is still called the chair; as the professor's chair, the chair of natural philosophy, &c. The curule chair was an ivory seat placed upon a car, in which the prime meristrates of ancient Europe and also these prime magistrates of ancient Rome sat, and also those to whom the honour of a triumph had been decreed. The sidn chair is a vehicle in which persons are carried. It is supported by two poles, and carried by two men. Though not much used at the present day, it was greatly in rogue a hundred years ago. In William Hogarth's works it is frequently represented.

Hogarth's works it is frequently represented.

CHALCEDONY. (See CALCEDONY.)

CHALDEAN PHILOSOPHY, kill-de'-an.—The ancient
Chaldees, favoured by wide plains, unclouded skies,
and clear, still nights, early turned their attention to
the study of the heavenly bodies. To them the sun,
moon, and stars were the superior intelligences who moon, and stars were the superior intelligences who created and sustain all things, and who guide the destinies of men. Hence they received divine worship and honours; and the study of their movements became a part of the priestly office. The learning of the Chaldees was greatly extolled in ancient times by Jews as well as Greeks; and they are generally allowed to have been the first people who made any considerable progress in astronomy. The determination of the lunar periods, of the equinoctial and solstitial points, a more

## Chaldron

precise definition of the solar year, the division of the coliptic into twelve squal parts, of the day into twelve hours; the signs, names, and figures of the sodisc; the invention of the dial—are among the improvements in astronomy attributed to the Chaldes. It is said that Callistenes, who accompanied Alexander the Great on his expedition, brought back with him from Babylon a series of astronomical observations extending over 1,903 years, or 2,234 years before the Christian ers. Astrology was also much practised among the priests, who, from the movements among the heavenly bodies, professed to be able to foretell future events. According to Diodorus, they distinguished the five planets by the appellation of "interpreters," because they foreshadowed the destinies of men and nations, and presided over the birth of each individual. They conpresided over the birth of each motivatual. Tasy con-ceived that besides the planets there were thirty stars, which were called the "consulting gods," twelve of which presided over the signs of the zodisc and the months of the year. Below these were twenty-four stars, of which half were to the north and visible, and half to the south and invisible, the visible being assigned to the living and the invisible to the dead; and they were denominated the "judges of the world." The interpretation of dreams, divination, incantations, and anguries, also occupied an important place in their system of knowledge.

CHALDEANS, or CHALDRES, in its widest sense and as used by the later Hebrew prophets and Greek and Roman writers, was synonymous with Babylonians, the ancient inhabitants of Babylonia; more strictly, it was applied to the people inhabiting the southwest part of that kingdom,—the country extending along the Persian gulf from the Buphrates to the Arabian desert. They are believed to have originally inhabited the Carduchian mountains, in the neighbourhood of Armenia, where Xenophon and others mention nood of Armenia, where Aenophon and others method the existence of a people of that name. At what period they descended to the plains below, history affords as no information; but at length they became so numerous and powerful as to prevail over the other inhabitants of the country, and by the time of the Jewish captivity their name had come to be applied to the inhabitants of Babylonia generally. Genenius and other recent philologists believe that the ancient name and race are preserved in the modern Kurda. The and race are preserved in the modern Kurds. Chaldmans were also an order of persons in Babylonia who are in the book of Daviel classed with the magicians and astrologers, and were consulted by the king ou matters of religion, evidently forming a sort of priest class. They also constituted the learned class of the people; and the term Chaldeans is applied by Greck and Roman writers to the whole order of the learned men of Balvylom. At a later period the name came to be given in the western parts of the world to persons who professed to interpret dreams and improvement the greatly in of others without reference. pose upon the credulity of others, without reference to

Chalder Language, käl-dee', is the name given by philologists to the castern dialect of the Aramaic, of which the Syriac is the western, and which forms the northern branch of the Semitic tongues, the Hebrew, Arabic, and some other minor dialects forming the southern branch. As the language of Babylonia at the time of the Jewish captivity, it was much used by that people after their return to their own land, and, indeed, as a written language it is now known to us only through the Jews, every trace of its literature baving disappeared, though it is still spoken by some of the tribes inhabiting the mountains of Kurdistan In the Hebrew canon, several chapters in Daniel and Bra are written in this language. As a dialect, it is distinguished from the Syriac by its avoiding diphthongs and the vowel o, for which it generally has dip the use of dagesh forts and the general accontuation of the last syllable. The mode of writing is also much less defective than in Syrisc, and in forms it is poorer than both the Hebrew and Syriac.

the place of their birth.

CHALDRON, tchal'-dron (Fr. chaudron), is an English dry measure, containing S6 coal bushels: 21 chaldrons make a score. In a chaldron of coal there are 12 sacks; and if five chaldrons be bought at one time, the vendor must deliver 63 sacks, the three additional sacks being termed the ingrain. In London and elsewhere, however the coal of the coarse of the sacks the coal of the coarse of the sacks. ever, at the present time, coals are sold by the son of

20 cwt. avoirdupois. In Newcastle, a chaldron of coals consists of 53 cwt., exactly double the London chaldron.

CRAINCE, tehalf-is (Lat. calie, a cup).—This term was formerly applied to an ordinary drinking-cup; but it is now only used to distinguish the cup employed in administering the Holy Sacrament. Silver is the metal of which chalices are usually made; but they are often of gold or gilt, and studied with jewels. They are sometimes made of agate, crystal, or glass; but, on account of their fragile nature, these substances are

account of their fragile nature, these substances are seldom employed in their manufacture.

CHALE, tshauk (Lat. calx, lime), a variety of limestone; or carbonate of lime, of a soft, earthy nature, generally of a yellowish-white colour, and sometimes pure white. It often forms strats of great size. It has an earthy fracture, is easily broken, and is rough to the touch. Some varieties of chalk are so compact that they can be employed as building-stones when cut or sawn into shape. After being burnt into quicklime, chalk is converted into mortar, in which shape it is much used. Silies, alumins, and magnesis are often present in chalk, and when these are removed by pounding and diffusing in water, it becomes whiting. Chalk is also largely used in the manufacture of soda, ADBLE IS RESO LETGELY USED IN the manufacture of soda, for the purpose of decomposing the sulphate of soda in the "balling" process; and it is also used as a manure. (See LIME.) Perfectly purified chalk, when mixed with vegetable colouring matters, such as turmeric, litmus, and saffron, forms pastil colours. Vienna white is merely purified chalk. (See CEANON.)

CHALLENGE. (See JUNY.) CHALLENGE TO FIGHT, tshill-lenj (Norm, chal-lenger, to claim), is an offence tending to provoke or misdemeanour to challenge to fight, either by word or letter, or to be the bearer of such challenge, and punishable by fine and imprisonment, according to the circumstances of the case; and a person who sends such challenge is liable to be apprehended and bound over in a recognizance to be of good behaviour.

CHALYBEATE SPRINGS, kāl-ib'-e-aif, natural waters containing iron in solution. For a full account and analysis of the most famous chalybeate springs, see MINERAL WATERS.

CHAMBLAUCIACRE, kam-e-law-se-at-se-e, in Bot., the Fringe-myrtle fam., a nat. ord. of dicotyledonous plants in the sub-class Calyciflorae. This is a small group of shrubby plants only found in Australia, having evergreen dotted leaves. They are nearly allied to Myrtacae, but may be distinguished from them by their heath-like aspect, their more or less pappose calyx, and by their truly eigenple leadled over and by their truly simple 1-celled ovary.

and by their truly simple I-celled ovary.

CRAMEROPS, kim'e-rops, in Bot., a gen. of Palms.

C. Agmilis is the only palm found wild in Europe.

Fibres obtained from it have been used as a substitute for horse-hair, and in Sicily the different parts of this plant are employed for making walking-cames, hats, baskets, and other useful articles. The materials from which the Brazilian chip or grass hats are manufactured are obtained from the species C. orgentea.

GRANDER, tehaim'-ler (Lat. camera), a portion of a house or of an apartment. The term is ordinarily a noise or or an appearance applied to a room intended for sleeping in. In policy and mercantile matters, a chamber is the place where certain assemblies or councils are held. The term is certain assemblies or councils are held. certain assembnes or councils are held. The term is also applied to the assemblies themselves, whether established for state purposes, for local government, for the administration of justice, or for the direction of commercial affairs. A chamber of commerce is a body of merchants and traders, who associate together in order to promote the mercantile interest of the town or district to which the society belongs. Chambers of commerce were first introduced into Scotland from the

commerce were first introduced into Scotland from the continent at the close of the last century.
Cinagens, in Mil., a term applied to a part of the hore at the breech end of a piece of artillery or smallerm. It contains the powder, but is contracted, so as not to admit the shot or shell. Chambers are of different forms, some being spherical, some cylindrical, and others conical or pear-shaped. The loading and firing of chambered guns are slower than those without chambers. They are generally used when the weight of the thot or shell is great in comparison with the charge that the shot or shell. Chambers are of different forms, some being spherical, some cylindrical, dothess conical or pear-shaped. The loading and ing of chambered guns are slower than those without amplers. They are generally used when the weight of the arms are slower than those without amplers. They are generally used when the weight of the animal at once contradicts both statements. Indolent and sluggish as it may appear, it

of powder. The chamber of a mine is the place, mostly of a cubical form, where the powder is confined.

CHAMPELIAIN, I than "berlein (Fr. chambellen;
Lat. cubicularius, prafectus cubiculi), is variously used

in our laws, statutes, and chronicles.

in our laws, statutes, and chronicles.

CHARREALIN, THE LORD GEREA, is an hereditary officer of great antiquity, and was once of the highest dignity in the state. The office was conferred by Henry I. on the family of De Vere, earls of Oxford, and was enjoyed by them for nearly six hundred years. On the death of the eighteenth earl, without issue, the honour descended, by a female heir, to the family of Bertie, and is now held jointly by the families of Chemondeley and Willoughby d Bresby, each family estigoring it alternately in each succeeding reign. He attends on the king at his coronation, has the care of the palace at Westminster, the fitting up of Westminster Hall for coronations, feasts, and other great occasions; he attends upon peers at their creation. occasions; he attends upon peers at their creation, and upon bishops when performing their homage to the sovereign. Many perquisites and fees belong to the sovereign. Many perquisites and fees belong to this office; but the former are usually compounded for at the performance of any of those ceremonies where they are claimed. The delivery of the sword of state to a distinguished member of the existing administration is left wholly to the choice and discretion of this official. Upon all occasions of public ceremony, the keys of Westminster Hall and of the Court of Requests are delivered to him, and at these times the gentleman usher of the black rod, the yeoman usher, and the doorkeepers, are at his command.

CHAMBERLAIN, LORD, OF THE HOUSEHOLD, who is not to be confounded with the preceding, is an officer of the royal household, having superintendence and control over all the servants employed about the royal chambers, except those of the bedchamber. The royal chaplains and other officers of the chapel royal, the physicians, surgeons, and apothecaries of the house-hold, as well as the royal tradesmen, are by his appointment. He has the oversight of the queen's band, and of all comedians, trumpeters, and messengers. The performance of stage plays in the metropolis and at Windsor, and wherever there is a royal palace, is not legal unless in a house or a place licensed by the lord chamberlain, whose license is also necessary to render legal the performance of a new play in any part of Britain. Persons to be presented at levees or drawing-rooms are required previously to scud their cards to him, and it is his duty to see that such persons are entitled to be presented to the sovereign. He is always a member of the privy council, and his tenure of office expires with his party. He has a salary of £2,000 a year, and is assisted in his duties by a vice chamberlain, whose tenure is also dependent on the administration, and who has a salary of £924.

CHAMBERTAIN OF THE CITY OF LONDON is an officer of considerable trest and dignity. He acts as treasurer of the corporation, regulates the admission of freemen, and settles all disputes between masters and apprentices. He is chosen annually by the livery at large; but in practice the office is usually for life, the same person being re-elected each year. Chamber Ardente, shumbr-ar-dant (Fr., burning

chamber), in French Hist., was the name given to a tribunal, established by Francis I. about 1535, for the special object of trying and condemning heretics to be burnt. Afterwards the name was given to the extra-ordinary commissions established under Louis XIV. for the examination of prisoners, and, under the re-gency of the duke of Orleans, against certain officers of the public revenue.

CHAMBRE INTROUVABLE (Fr., the undiscoverable chamber), in French Hist., was a name bestowed, in ridicule, on the chamber of deputies which met after the second restoration of Louis XVIII. (1915), on ac-

count of its coldness and anti-nationality.

CHAMELEON, kim-e'-le-on.—This reptile has probably been the subject of more delusion than any other member of the animal kingdom. The two most

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## Chameleon Mineral

has an appetite for comething more substantial than air, and enjoys an exercise of its limbs as much as any other reptile. The most curious part of the air, and enjoys an ereroise of its lambs as much as any other reptile. The most curious part of the animal is its tongue; and it is owing to the singular nature of this organ that the erroneous idea arose of its subsisting on air. This tongue is composed of a nollow tube, which is terminated by a fleshy knob, and has a oup-like cavity in its anterior surface: this is covered with a glutinous secretion. By a wonderful provision the animal can dart its tongue with lightning-like swiftness and extraordinary sureness of aim at its press. The guickness of this proceeding, together with prey. The quickness of this proceeding, together with the length of time the chameleon will exist without food, may, in a great measure, account for the popular delusion. With regard to its colour-changing propensity much might be said and quoted; only that it is not needful, as this phenomenon has been frequently and satis-factorily explained. The result of Mr. Milne Edwards's investigation is, in substance, as follows:—Beneath the transparent epidermis of this reptile there is a great quantity of minute soft granules, which bear the dif-ferent colours: these are more or less extended, according to the quantity of blood that reaches them, and the change of colour is thus effected. The changes it really will undergo under certain powerful excitements are from its natural colour, pale grey, through pale green to yellow and dingy red, and sometimes, but rarely, nearly to black. The chameleon is a most sluggish animal, and will sit for hours on the branch of a tree, scarcely giving any token of its existence be-youd an occasional roll of its singular eye, which possesses the property of independent motion; and thus, while one eye is quite motionless, the other will pro-trude from the animal's head, and glare in a hideons fashion. Then, perhaps, suddenly it will dart out its tongue oftentimes to twice the length of the whole animal, and whick some unfortunate insect into its jaws. The period of time a chameleon will exist without food is astonishing. Hesselquist makes mention of one he kept for a month, which during the whole time, as far as he could ascertain, did not eat a single insect. Of this genus there are about eighteen species, all of which are natives of the Old World, principally to be found in Africa and Asia. Some species, however, have been naturalized in Europe.

CHAMELEON MINERAL.—Manganate of potash was so called from the changes of colour apparent in an alkaline solution of the salt. It is made by fusing binoxide of manganese with carbonate of potash in an open

CHANOIS, sham'-moi (Antilope rupicarpa). — The chamois is rather larger than the roebuck, and, when full grown, weighs from sixty to eighty pounds. colour changes with the seasons. In summer it is of a dusky yellowish brown, and in winter jet black, excepting the hair of the forehead, the belly, and the tufts of hair that overhang the hoofs, which is tawny, and remains so always. The black stripe, too, extending from the eyes to the mouth is permanent. It has been a disputed point whether the chamois should be classed with the goat or the antelope genus. Examina-tion, however, shows that there is really but little affinity either in the structure of the animals or their habits. The frontal bone of the chamois just before the horns is concave; that of the goat is convex. The horns of is concave; that of the goat is convex. The horns of the latter recede; those of the former advance, and are perfectly plain and smooth, while the goat's horns are wrinkled. More than all, the chamois is well known to avoid spots favoured by goats; and no instance has ever been shown where a female of either species has brought forth a cross-bred kid. The head of the chamois exhibits in its construction a wonderful blending of lightness and strength. The frontal bones are so of lightness and strength. The frontal bones are so fragile that a rap of a man's knuckles would suffice to shatter them, that is, if they were unsupported; but they are supported, and in a marvellous way. Over the first set of bones a second is thrown, and between the walls are arched cells and substantial girders of solid

#### Chamois

point it is dense and solid. The hollow part fits over a bony protuberance growing out of the skill itself. The horns of a full-grown buck measure about neven inches in length, the points being extremely sharp, and hooked backwards. At first sight it would seen that see weapons of attack or defence, the chamois horse, from their formation, would be next to useless. This however, is far from the state of the case. When fighting the aborton larger his however have the contractions of the case. ing, the chamois lowers his horns under the thron ing, the chamois lowers his horns under the throat we his antagonist, or turns his head sideways, that the sharp point may come against the shoulder of the enemy, and then, drawing them back vigorously, inflicts a most formidable gash. The horns of the male chamois are thicker and altogether stronger-looking than those of the female; they do not diverge from each other



CHAMOIS.

in so straight a line as do hers, but describe a slight curve as they rise upwards and apart from each other. The horns of the doe are not so abruptly hooked as those of her mate. Except when running, the gait of the chamois is extremely awkward. The cause is evident. In the first place, its hoofs, shaped like those of the sheep, but longer and more pointed, are calculated for sliding rather than for stepping, and, in the second, its hinder ranner than for stepping, and, in the second, its hinder legs have every appearance of being longer than the fore. A hunter afoot would probably overtake a cha-mois fleeing over a level plain; but among its native ice-bills the case is very different. Then the true pur-pose of the awkward-looking hind legs appears. Not only do they serve as springs, enabling him to perform princulous fiving leave from case to great but the miraculous fiving leaps from crag to crag, but they break the concussion that would otherwise certainly break the concussion that would otherwise certainly occur in a leap from a great height, and enable the animal to alight with safety and freedom. A perpendicular wall of rock smooth as glass, and twelve or fifteen feet in height, is no impediment to the upward flight of a chamois. He will leap against the slippery wall, and, striking it with his hind feet, obtain a renewed apring, rebound again in an opposite direction to some higher bank, and there find firm footing on a patch so small that a man's two hands could cover it. The food of the chamois consists of such herbs and lichens as grow on the mountains; when, however, the winter sets in so flereely that every green thing perishes, the animals shift their quarters from the steeps to the woods that grow at their bases, and there subsist on grass and leaves. An odorous dark-coloured ball is found in the stomach of the chamois, and probably owes its formation to the fibrous and resinous nature of the substances on which it feeds. At the pairing season, a sort of bladder beneath the skin of the buck's borns develops itself. This bladder contains a lymph of a strong musk-like smell, and, if shot at this season, the skin of the head will retain the scent for many years. At this scented period the chamois bucks, incited years. At this scented period the chamois buoks, nontear by jealousy, have most tremendous combats together, and it is at this season that the hunter can easily decay them to within gunshot by imitating their love-call. The young are born in May, the chamois doe having sometimes two kids at a birth, but frequently but one, the pairing season is November; the period of gestation about twenty weeks. It is only about November that the full grown partiarched luncks roam at large, walls are arched cells and substantial girders of solid bone. The arched girders which occupy the space between the upper and lower surface rise, bridge-like, with a spiral twiet, and here and there a flying buttrees will give additional strength to the walls, or a lateral track help to support the vault above. The horns of the chamois are very curiously constructed. Up to a the chamois are very curiously constructed. Up to a sertain point the horn is hollow, and thence to the most secluded and inaccessible places. No animal approach that the full-grown partiarchal bucks room at large, the remaining portion of the year keeping close in the most secluded and inaccessible places. No animal approach the support of the serial point the horn is hollow, and thence to the

#### Chamomile

ossesses so tough a skin as the chamols. It will some possesses so tough a same as any bullet will send one times happen that the hunter's bullet will send one toppling over a precipice nearly a thousand feet deep; but though every bone in its body be smashed by the Tall, the hide will remain intact.

CHAMOMILE. (See ARTHBHIS.) CHAMP DE MARS and CHAMP DE MAI, shawn(g)-dewar (Fr.), in early French Hist., denoted certain public assemblies of the Franks, which were instituted as early as their conquest of Gaul in the 5th century. At first, these were held annually in the month of Masch, and were hence called the March-fields (Champ de Mars); but in the 8th century king Pepin transferred the time of meeting to the month of May; whence they were termed May, fields. At these meetings, the king, courtiers, bishops, nobles, and people, assembled together for the discussion of public affairs, such as war, peace, the enactment of laws, all which questions were decided by the majority. The common people, however, long neglected their privilege of attending, and were at length deprived of it. Charleattending, and were at length deprived of it. Charle-magne in some measure restored it to them by order-ing that every count should bring with him thirteen assessors, or the same number of the most respectable men within his jurisduction, to represent the people in the general assembly. The first descendants of Capet departed from this usage; but Philip IV. (1285-1314) restored the third estate by calling together delegates

from the cities.

CHAMPAGNE WINE, sham'-pain, is produced from the grapes grown in Champagne, an aucient province of France. This favourite wine is divided into two classes,—white and red champagne. The former is made either sparkling or still. Sparkling champagne (mousseux) is produced by treating the wine in a particular manner during fermentation. The wine racked off in December, and after being fined with isinglass, is bottled and securely corked. Carbonic acid is generated in the wine on account of the incomplete nature of the fermentation, and its effer-vescing qualities depend upon the quantity of that gas dissolved by the fluid. After the sediment which is deposited has been removed, a liquor, composed of a solution of sugar-candy in Cognac, is added, and each bottle is tightly re-corked. Still Champagne is first racked off in the March after the vintage. The white Champagnes of Rheims and Sillery are considered the Those of Sillery are pale amber-coloured, dry spirituous, and possess a superior bouquet; those of Ay and Mareuil are more sparkling and less spirituous. There are several varieties of first-class red champagnes. On account of the profitable nature of the pagas. On account of the promator nature of the manufacture, and the popularity of Champagne wine, it is much adulterated with the juice of pears, goose-berries, &c. Very little of the wine sold as Champagne in Paris is really genuine. It generally consists of some cheap light white wine charged with carbonic soid gas.

CHAMPEUTY, cham!-per-te (Lat. campi partitio Fr. champart), in Law, is a species of maintenance, and punished in the same manner, being a bargain made by a man with a plaintiff or defendant campum partire,—to divide the land or other matter sued for between them, if they prevail at law; whereupon the champertor is to carry on the party's suit at his own expense. Thus champart, in the French law, signifies a similar division of profits, being a part of the crop annually due to the landlord by bargain or custom. In our sense of the word, it signifies the purchasing of a suit, or the right of suing,—a practice so much abhorred by our law, that it is one main reason why a chose en action, or thing of which one has the right, but not the possesis not assignable at common law, because no man sion, is not assignable at common law, because no man should purchase any pretence to see in another's right. By the Roman law, such offenders were punished by the forfeiture of a third part of their goods and by perpetual infamy. Hitherro must also be referred the provision of the statute 32 Hen. VIII. c. 9, that no one that are the provision of the statute 32 Hen. VIII. c. 9, that no one shall sell or purchase any pretended right or title to land, unless the vendor bath received the profits thereof for one whole year before such grant, or hath been in the actual possession of the land, or of the reversion or remainder, on pain that both purchaser and vendor shall each torfeit the value of such land to the king

## Chancellor, Lord

CHAMPIGNON. (See AGARIOUS.)

CHAMPIGNON. (See AGARIOUS.)

CHAMPION, tehdw-pre-on (Fr.), in the Middle Ages was a pers on who took up the cause and fought in the room of another, who from age, infirmity, or other cause, might, be so represented. Single combst was one of the ways frequently adopted in the Middle Ages to decide the right of a cause; and women, children, or aged persons, were allowed to appear by a representative. At one time the champions formed a particular class, were compelled to wear a particular dress, and were looked upon as disreputable, being ready for hire to take up any quarrel. At a later period, however, during the ages of chivalry, the champion was a knight who entered the lists on behalf of an injured lady, achild, or one incapable of self-defence. The king's child, or one incapable of self-defence. The king's champion of England is a very sucient office, and is annexed to the Scrivelsby estate in Lincolnshire, having been held by the Dymoke family for many generations. The champion, armed cap.a.pic, and mounted on horse-back, enters Westminster Hall during the coronation banquet, and proclaims by a herald "that if any one shall deny the king's title to the crown, he is there ready to defend it in single combat; after which the king drinks to him, and then sends the cup to the cham-pion, who drinks, and then carries off the cup as his

CHANCE, tshance, may be said to denote the cause or mode of happening of an event which is unexpected, or the cause of which is not manifest to human reason. Originally, it was applied to events which were believed to happen independent of any law or cause; but this is a sense in which it is now seldom or never employed; for both reason and revelation assure us that there is no such thing as chance in this seuse. Everything has its own law and its proper cause, and chance merely denotes that we do not know the proper cause nor the

democrating to which a phenomenon occurs.

CHANCEL, tshôn'-sel (Lat. cancellus, a acreen), the name given to that part of the choir of a church between the communion-table or altar and the balustrade or rail that incloses the space where the ultar is situated. The term is generally confined to parish churches which have no aisles round the choir, or chapels con-nected with it. Sometimes the chancel and the choir are synonymous. Before the Reformation, the service was always performed in the chancel, and at that time the clergy were held to have a special right to it. the present day, its repairs generally fail upon the impropriator or rector, and not on the parish. The impropriator or rector has a right to the principal pew in the chancel, but he cannot erect a tablet there withont the leave of the ordinary. The chancel corresponds with the bema of the ancient basilica.

CHANCELLOR, tshan'-sel-lar (Lat. cancellarius, from canadh, nattice-work or railings), denoted originally a porter or doorkeeper,—one stationed at the lattice-work of a window or doorway to introduce visitors. Afterwards, under the later emperors, the name was given to a kind of secretary or scribe in the courts of law, from his position behind a screen or lattice-work separating him from the rest of the hall of Gradually he appears to have risen in power and authority, and to have acquired certain judicial powers and a kind of superintendence over the other officers of the empire. From the empire the title and office passed to the Roman church, and hence every bishop still has his chancellor, the principal judge of his consistory: and when the modern kingdoms of Europe were established upon the ruins of the empire, almost every state preserved its chancellor, with different jurisdictions and dignities, according to their different constitutions. In all he seems to have had the supervision of all charters, letters, and such other public instruments of the crown as were authenticated in the

most solem numner; and therefore, when seals came to be used, he had the custody of the king's great sail. CHANCILLOR, LORD, in England, was originally the sovereign's chief secretary, and, from the nature of this office, his adviser, and was hence called the keeper of the king's conscience. Pattions and alarms are of the king's conserience. Petitions and claims were referred to him, and he formully prepared the royal grants and charters, affixing the king's seal to them. He thus became keeper of the great seal, and was shall each forfeit the value of such land to the king invested with great discretionary power. He is created and the prosecutor. (See Barrater, Maintenance.) by the will of the sovereign, by the mere act of deliver-

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## Chancellor of a Bishop

Chan-Books

ing the great seal into his custody, and he holds office during the pleasure of the crown; but practically he resigns office with his party. He is, by prescription, speaker of the House of Liords, and, by wirtue of his office, a member of the privy council. He issues writs for summoning parliament, and transacts all business connected with the custody of the great seal. He is principal advisor of the crown in matters of law, chiefjudge in the Court of Chancery, and the head of the profession of the law. He appoints nearly all the judges of the superior courts, the commissioners in bankruptcy, and the judges of the county courts; appoints all justices of the peace, though usually upon the recommendation of the lords-licutenant of the several counters, and is patron of all crown livings rated under menation of the lords-leutenant of the several counties, and is patron of all crown livings rated under \$20 (in the reign of Henry VIII.). He is visitor, in right of the crown, of all hospitals and colleges of royal foundation; has the general guardianship of all infants, idious, and lunatics; and exercises a special jurisdiction to the contraction of t natures, and trunstics; and exercises a special jurisdiction in questions relating to charities and trust estates. He ranks above all dukes not of the blood royal, and next to the archbishop of Canterbury. He has a salary of £10,000 a year, and an annuity of £5,000 on retiring from office. There is also a lord chancellor in Ireland, whose authority within his own jurisdiction is in most cases the same as that of the lord chancellor of Great Britain. He is appointed only during pleasure, and retires with the political party at whose instance he had been appointed. His salary is £8,000 per annum. In Scotland, prior to the union of the two kingdoms in 1707, there was also a lord chancellor, whose duties were analogous to those of the lord chancellor of Great Britain. At the Union this office was abolished, and in its place that of keeper of the great seal was created, for affixing the great seal to such writs as have to pass under it.

CHANCELLOR OF A BISHOP OF DIOCESE, is vicargeneral to the bishop, directing and assisting him in all matters of ecclesiastical law, and holding his courts for him. It is not necessary that he be an ecclesiastic, but, if a layman or married, he must, by the canons, be

Dut, it a layman or married, he must, by the canons, be at least a master of arts or a bachelor of law.

CHANCELOR OF A CATHIDRAL, is an officer who superintends the arrangements for the regular performance of the religious services.

CHANCELOR OF A UNIVERSITY, is usually the highest officer of the university, and exercises exclusive jurisdiction in all questions that concern the

members of the university.

Chancellog of the Duchy of Lancaster, is an officer appointed chiefly to determine controversies between the king and his tenants of the duchy of Lancaster. The court is held at Westminster, but is not much resorted to, and is usually presided over by the chancellor's deputy.

CHANCELLOR OF THE EXCHEQUER. (See EXCHE

CHANCELLOR OF THE ORDER OF THE GARTER, and other orders of knighthood, is an officer who seals the commissions and mandates of the chapter and assembly of the knights, keeps the register of their proceedings, and delivers acts thereof under the seal of their order. He also exercises various functions at the installation of the knights.

CHANCE-MEDLEY, OF CHAUD-MEDLEY.—The former signifies a casual affray, the latter an affray in the heat of blood or passion, in which death ensues to the assailant. The law authorizes a man to protect himself from an assault or the like, in the case of a sudden brawl or quarrel, by killing him who assaults him, and considers it justifiedth homicide. It does not apply to a case of attacking, and only when certain and immediate auffering would be the consequence of waiting for the assistance of the law. Wherefore, to excuse homicide by the plea of self-defence, it must appear that the slayer had no other possible, or at least probable, means of escaping from his assailant. If he had, then the offence would amount to mantaughter, or, possibly, sawder, according to the circumstances of the case, and the distinction made by the law in determining whether the one or the other crime had been committed. from an assault or the like, in the case of a sudden whether the one or the other crime had been committed Any accidental or unpremeditated killing of a person. without negligence or carelessness, us by a werkman throwing down rubbish from a house after giving suffi-dient warning, or an officer whipping a criminal in a 488

reasonable manner, and such like, is chance-medley and misadventure.

misadventure.

Changery. (See Court of Changery.)

Changery. (See Court of Changery.)

Changer States, shin-dos', is applied to a distinct of the Reform Bill which gives the franchise to temantic under lease or at will in the counties paying not best than £50 of rent. A motion to this effect was made by the marquis of Chandos, and carried, after much opposition, by a majority of eighty-four. (See Resour.)

Bill.)

CHANGELING, tahainje'-ling (Ang. Sax.).—It was at one time a common superstition that young children were liable to be stolen or changed by fairles before being baptized; and hence they were carefully watched being Daphtzeu; and nence they were carefully wascusare till that ceremony was over. It was thought that the fairies were always anxious to change their own starve-ling elves for the more robust children of men. The children so left were called changelings, and were known by their greater backwardness in growth or learning: hence stunted or idiotical children were re-

garded as changelings.

CHANNEL, tshan'-nel (Fr. canal), a passage or place of flowing. The term is generally applied to a water-course. The deeper part of a river, through which the principal current flows, is generally called the channel. The strait or narrow sea between two islands, or a conti-

The strait or narrow sea between two islands, or a continent and an island, is also called a channel; as the British Channel, the Irish Channel, &c.

CHANT, tshant (Fr. chanter, to sing), in its most extended sense, is applied to the musical performance of all those parts of the liturgy which by the rubric are permitted to be sung. More particularly, and as distinguished from singing, it is applied to that plain tune to which the prayers, litany, &c., are set in choirs and places where they sing. In the chant, when properly and fully performed, both the minister and the choir bear their respective parts, the minister reciting the prayers and all the parts of the service which he is enjoined to say alone (except the lessons) in one sustained note, occasionally varied at the close of a cadence, and the choir making the responses in harmony, sometimes in unison. In the Psalms and Cautimony, sometimes in unison. In the Psalms and Canti-cles both the minister and choir join together in the chant without distinction, each verse being sung in full harmony. The chanting of prayers has always been observed in the principal of our cathedrals. In church history we meet with different kinds of chants er songs; as the Ambrosian, introduced by St. Ambrose; the Gregorian, by Pope Gregory the Great .- Ref. Hook's

Church Dictionary.

CHANTEN, tshim'-tre (Lat. cantaria), was a little chapel or particular altar in a cathedral church, built and endowed for the maintenance of a priest to say or sing masses for the soul of the founder, and such others as he might appoint. There were many of these in England before the Reformation; but in the thirty-seventh year of Henry VIII. the chantries were given to the king, who had power at any time to issue commissions to seize their endowments, and take them into his possession; and such as were not then seized

were afterwards vested in his successor, Edward VI. Chaos, kai'os (Gr.), is applied to the confused mass or the state of confusion, in which matter is supposed to have existed before it was reduced to order by the creating power of Deity. In the ancient Greek mythology, chaos was the vacant infinite space which existed before the creation of the world, and out of which sprang all things that exist. Chaos, secording to Hesiod, produced by and out of itself Erebus and Night, who in turn were the parents of Æther and

CHAP-BOOKS, tshap'-books, is the name given to a kind Char-Books, thidp'-books, is the name given to a sinal of literature that was at one time very common in this country. The designation is probably derived from their forming part of the stock in trade of the chapman or travelling merchant. They were of inferior paper and typography, and the older of them, in the early part of the seventeenth century, are printed in black letter, in the form of small volumes. Their contexts were of a very wiscellenger nature, conversions tents were of a very miscellaneous nature, comprising lives of heroes, martyrs, and other remarkable persons; stories of ghosts, giants, witches; dream-books, &c.
The Penny Chap-books, were a later and an inferior
class of literature. They consisted usually of a single
sheet of paper, folded so as to form twenty-four pages.

p 9

Charcoal

Their contents were chiefly narratives either in prose or verse, and were characterized by a considerable degree of broad humour, and frequently not without a goodly sprinkling of obsenity. This class of literature was at one time very popular, and has scarcely yet passed out of use in the more remote parts of England and Scotland. It is said that nearly all these Penny and Scotland. It is said that nearly all these Penny Chap-books were the production of one man, Dougald Graham, who, previous to his death in 1789, was bell-man or town-erier of Glasgow.—For further information on this subject, see Chambers's Encyclopædia and the authorities therein referred to.

Culrus, tshap'-el (Lat. capella, Fr. chapelle), is an edifice for public worship, usually of a lower order, or not possessed of the same privileges, as a church. or not possessed of the same privileges, as a church. Whore parishes are large or populous, parcehial chapels, or chapels of ease, have frequently been erected for the accommodation of the people, with the consent of the bishop; and many of these have had districts assigned to them with the cure of souls, and the right of celebrating bapbisms, marriages, &c., under special acts of parliament. Dissenting places of worship are also usually called chapels. The term is also applied to places for the celebration of religious worship in the houses of noblemen, hospitals, colleges, and similar establishments. In Catholic countries the term chapel is used to designate separate erections either within or attached to a church or cathedral, and devoted to special services. These are also called chantries. (See CHANTEY.)

CHAPEL, in a printing-office, is an association of the CHAFEL, in a printing-onice, is an association of the workmen for the purpose of enforcing order and regularity in the office, and settling any disputes that may arise. It takes cognizance of all offences, real or imaginary, committed within the office, and punishes by the infliction of fines. The president is elected by the other workmen, and is termed the "father of the

CHAPERON, shap'-e-ron (Fr.), a hood or cap worn by the knights of the Garter. It was formerly worn by men and women of every degree, and ofterwards ap propriated by the doctors and licentiates in colleges, &c. The name afterwards passed to certain little shields and other funeral devices placed on the heads shields and other funeral devices placed on the heads of horses at pompous funerals. A person who acts as a guide or protection to a lady at a public place is called a chaperon, probably because the cap or hood was formerly worn by persons acting in a like capacity. Chapters, thurb-c-ters (Fr. chapters), signified, in our ancient common law, a summary of such matters as were to be inquired of or presented before justices in evre, instices of assize or of the peace in their

in eyre, justices of assize or of the peace, in their sessions. These chapiters are now those articles which

are delivered by the justice to the inquest or jury.

CHAPLAIN, tshäp'-lain (Lat. capellanus), is properly
a person who performs divine worship in a chapel, as a person who performs divine worship in a chapel, as distinguished from one who officiates in a parish church. Hence it is also applied to those who are engaged to perform religious services in the army and navy, in families of distinction, hospitals, workhouses, &c. The mobility enjoy the right of appointing a certain number of private chaplains who are entitled to certain privileges respecting the holding of benefices, &c.; thus, an archbishop may have eight, a bishop or duke six, a marquis or earl five, a viscount four, &c. Chapter, takip-let (Ital. ciapelletto), is a string of beads made use of by Roman Catholics and others to count the number of their prayers. Its invention is by some attributed to Peter the Hermit, by others to St. Dominick, who is said to have received one out of heaven from the Virgin Mary. (See ROSANX.)

believed to support Nestorianism. They were—1. the writings of Theodore of Mopsuestia; 2. the books which Theodoret of Cyrus wrote against Cyril's anathemas of the Nestorians; and 3. the letter which ihas of Edessa published against the council of Ephesus which condemned Nestorius. They were condemned by the emperor Justinian in 544; but the African and Western bishops, especially Vigilius of Rome, opposed the edict.

CHARACER, kä-rai'-se-e, in Bot., the Chara fam., a nat. ord. of acotyledonous plants, in the sub-class Acrogenæ, water-plants with distinct stems branching in a whorled manner, sometimes transparent and some

in a whorled manner, sometimes transparent and sometimes coated with carbonate of lime. They coour in stagnant, fresh, or salt water in all parts of the globe, but most abundantly in temperate climates. When in a state of decay, they give off a very footid odour, which is considered to be very injurious to animal life.

CRARACTER, kdy'-āk-ter (Lat. character, Fr. cornetère), in Bet, the term usually applied to a list of the points by which any particular variety, species, genus, sub-order, order, sub-class, or class, is distinguished from another. There are two kinds of characters, called respectively essential and natural. By an essential character is understood an enumeration of those points only by which any division of plants may be distinguished from others of the same nature. A natural character, on the other hand, is a complete natural character, on the other hand, is a complete description of a given species, genus, order, or class, including an account of every organ, from the root upwards, through the stem, leaves, flowers, fruit, and

CHARADE, sha-rade' (Fr.), is a kind of riddle, in which a word of several syllables is taken, and an enigmatical description of each of its syllables given enigmatical description of each of its syllables given separately, and then a similar description of the whole word. The descriptions should be so contrived as to be in some way connected together. The following is a good example, from the French:—"My first makes use of my second to eat my whole:" the first being chien, a dog; the second dent, a tooth; and the whole chiendent, dogs grass.

Charronroux. shar-hon-roo! (Fr.) charcos are

Charbonhoux, shar-bon-roo' (Fr.), charcoal pre-pared below a red heat, by which means it retains a considerable portion of oxygen and hydrogen. Ordiconsiderable better to organize and any charcoal contains 90 per cent. of carbon; while charbonroux contains only 70 per cent., the remainder being oxygen and hydrogen. Gunpowder made with this charcoal appears to inflame with greater energy than that made with ordinary charcoal. On theoretical grounds, however, it appears to be inferior to ordinary

powder.

Chargoal, tshar'-kole.—This well-known substance exists under a great number of forms; such as gasarbon, coke, wood-charcoal, lamp-black, and ivery-black. Gas-carbon is a very pure kind of charcoal gradually deposited in the insides of gas-retorts. Coke is dense charcoal, made by burning coal in a retort or coke-oven from which the air is excluded. It is much used as a fuel for locomotives, from giving out no smoke, and from being much lighter than coal. Wood-charcoal, although but little used in England as a fuel, is a very important element in the mannfacture of gunpowder. The most perfect charcoal is, of course, that which is used in this manufacture. (See Gun-rowders.) Thoroughly-burnt charcoal is bluish black, and varies in density according to the porosity of the wood from which it was made. Charcoal possesses the CHARCOAL, tshar'-kole.-This well-known substance wood from which twas made. Unarcoal possesses the wonderful property of absorbing gases. (See Careon.) Lamp-black is carbon deposited by any combustible burnt without sufficient sir. (See Limbert Lory-black, bone-black, or animal charcoal, will be found described under the head of Ivory-black. St. Dominick, who is said to have received one out of heaven from the Virgin Mary. (See Rosary.)

Chapman, tahip-min (Old Eng. cheap, a market), denotes generally a merchant; but it is commonly ministed to one who deals only in small articles,—one who traves the country and attends markets.

Chaptar, tahip-ter (Lat. capitulus, from asput, the head) is applied to the society of canons in a cathedral or collegiate church, of which the dean is the head, and which form the council of the bishop. (See Canon.)

Attached to many cathedrals and collegiate churches are buildings for the meeting of the chapter, called sare buildings for the meeting of the chapter, called sare buildings for the meeting of the chapter, called sare buildings for the meeting of the chapter, called sare buildings for the meeting of the chapter, called to many cathedrals and collegiate churches are buildings for the meeting of the chapter, called to many cathedrals and collegiate churches of chapter-houses, which are frequently alluded to in the ecclesiastical history of the 6th century, and occasioned much discussion in the Church, as they were the most perfectly non-volatile, and possessing no affinity for any other element at ordinary temperatures, it forms should much discussion in the Church, as they were

carbon ink are as legible and perfect as the first day

they were written.

CHAEG, tsharje (Low Lat. cargare, Fr. charger), is
the address delivered by a bishop or other prelate at a
visitation of the olergy under his jurisdiction. Among
Freebyterians and dissenters generally, it is a sermon
preached to a minister at his ordination, usually by
some aged or shle preacher, and bearing upon the
mature, duties, trials, and encouragements of the pastopal office. toral office.

CHARGE (Fr. charger), in Her., the name given to figures of any kind represented on a shield, which is said to be charged with whatever figures may be depicted on it. The charges on a shield should be few and simple, and as appropriate as possible to the character or achievements of the original bearer of the coat. The simplicity of armorial bearings is a strong

proof of their antiquity.

CHARGE, in Law, is an incumbrance upon property as an annuity, mortgage, judgment, or any liability to which it is made subject by a deed, will, or other instrument, or by the operation of law or equity.

CHARGE, in Mil., an expression used to denote the quantity of powder which is necessary to fire a ball, shell, or bullet from any kind of cannon or firearm. The charge for different kinds of artillery, and for dif-ferent purposes, varies from one-twelfth to one-half the weight of the projectile. Rifted cannon require a smaller charge than those with smooth bores; and in firing against a vessel or a body of troops at a short range, a smaller charge is needed for the same gun than would be required for breaching the walls of a fortress. The term is also applied to the onset made by one body of troops on another with fixed bayonets.

CHARGE D'AFFAIRES, sharf'-döf-fair' (Fr.), is the fourth, or lowest order of diplomatic agents, and is accredited not to the sovereign, but only to the individual who, for the time being, holds the office of principal secretary of state or minister for foreign affairs. Sometimes they are only empowered to act during the absence of the ambassador; at other times, they are independent of any ambassador.

CHARIOT, tshär'-e-ut (Fr.), was a kind of carriage employed in ancient times in war or for pleasure. We read of them as early as the time of Pharaoh, and they were frequently armed with scythes, as we read of them to have been with the ancient Britons. The ancient chariots had only two wheels, which revolved upon the axle, and were usually drawn by two horses. Among the Romans, however, there were also three- and four-horse chariots. The triumphal chariots of the Romans were often upon the state of the Rom

were often most splendidly adorned.

CHARISMA, kā-rie'-mā (Gr., a gift), a term frequently employed in the early Church to denote the extraordinary endowments conferred on the primitive Church; as the gift of tongues. It was also applied

sometimes to baptism.

CHARITY, thiar-e-te (Lat. caritas, from carus, dear; Gr. agape, love), one of the three great theological virtues, consisting of love to God and our neighbours, or the habit and disposition of loving God with all our heart and our neighbour as ourselves. In a narrower sense, it signifies kindness, goodwill, and forbearance towards mankind in general, and, in a still lower sense, the giving of alms. This love to our neighbours, which is one of the greatest and noblest of Christian virtues, is not of a blind, indiscriminating character. True charity attempts not to shut our eyes to the distinction between good and bad men, nor to warm our thereto between good and oad men, nor to warm our bearts equally to those who befriend and those who fajure us. It teaches us to slight and despise no man, inspiring us with forgiveness and humanity towards our enemies, with respect and esteem for good men, with candour and complacency towards our friends.

"Charity is the comforter of the afflicted, the prosector of the oppressed, the reconciler of differences, tector of the oppressed, the reconciler of differences, the intercoses for offenders. It is faithfulness in the friend, public spirit in the magistrate, equity and patience in the judge, moderation in the sovereign, and loyalty in the subject."—Barrow.

CHARITY COMMISSIONERS for England and Wales are a body of commissioners exacted by the Charitable Trusts Act of 1853, for inquiring into all charities, their nature chiagts and administration, and the action.

## Charter

to call for the production of accounts and documents from trustees, and to appoint inspectors to visit and report upon their management. Their powers do not extend to Scotland, Ireland, the universities, or London. A report of their proceedings must annually be laid before parliament.

CHARITY, SISTERS OF. (See SISTERS OF CHARITY.)
CHARITY SCHOOLS. (See SCHOOL.)
CHARITYARI, shar'-e-ve'-re, is a French term, of enectain etymology, but denoting properly a loud, discordant noise, produced by the beating of kettles, pans, and other domestic utensils, mingled with shouts, recease and bisses. In this way, provide dilibe were groans, and hisses. In this way, popular dislike was frequently manifested towards a person in France in the Middle Ages; and widows contracting second marriages, or persons of disproportionate ages marrying, were often annoyed in this way. Afterwards, the lng, were often annoyed in this way. Alterwate, the term came to be applied to political squibs and satires against public men; and in this sense it was adopted as the title of a French periodical published in Paris, corresponding to our English Punch. It may be mentioned, that the name of the German periodical of the same kind, published in Berlin, Kladderadatsch, also implies a loud, discordant noise, such as is occasioned

by the beating of kettles and pans.

CHARLATAN, sharl-a-tan (Ital. ciarlatano), denotes a mountchank, quack doctor, or empiric, and is hence applied to any one who makes loud pretensions to knowledge or skill which he does not possess. Charlatanism is to be found among all classes of society, and manifests itself in various ways, according to the object and character of the person. In literature, in science, in politics, and even in religion, there are to be found many who pretend to greater knowledge, or

be found many who precend to greater anowards, as power, or virtue, than they possess.

CHARLES'S WAIN, tsharts's wain, in Astron., the name given to seven starts in a constellation of the northern hemisphere, called Ursa Major, or the Great Bear. (See Uesa Major.) The origin of the name is not known.

CHARM, tsharm (Lat. carmen, a verse), is a magical power or spell, by which witches and sorcerers, with the assistance of the davil, were supposed to do wonderful things beyond the powers of nature. (See MAGIC.) CHARKE-HOUSE, thing-hour (Lat. caro, flesh), was a place under a church, or in a churchyard, where

the bones of the dead which were thrown up by the

gravediggers were deposited.
Charu, tsharr (Salmo salvelinus), a fish of the Salmon amily, inhabiting the lakes of Scotland, Wales, and the north of England. The body is longer and more slender than that of the trout. The back is of an olive colour, speckled with white spots, and the belly red. Its flesh

is held in high estimation.

CHART, tehart (Lat. charta), a hydrographical or sea chart for the use of navigators, exhibiting some part of the sea, or other water, with the coasts, islands, rocks, sands, bearings, &c. After the Admiralty has scanned any coast engravings, charts are engraved and sold at prices below their cost. Every available chart is supplied to men-of-war when proceeding to any particular district. At several places, such as Gibraltar and the Cape of Good Hope, depôts for charts are established. All charts are brought back to England

again, and are not re-issued without being revised.
CHARTA MAGNA. (See MAGNA CHARTA.)
CHARTA, short (Lat. charta, paper), in French Hist.,
was originally applied to the letters or charters by which the French kings conferred rights or privileges on certain towns or communities; but it is now applied to the solemn acknowledgment made by Louis XVIII., on his restoration in 1814, of the rights of the French nation. It consisted of sixty-nine articles, and in principle was somewhat analogous to the Magna Charta and Bill of Rights of the British constitution. A misconstruction of one of the articles of this charteled to the revolution of 1830. It constituted the fundamental law of the French constitution down to the revolution of 1848,

patience in the judge, moderation in the sovereign, and loyalty in the subject."—Barrow.

CHARIER, tshar'-ter (Fr. chartre), is the written care a body of commissioners expated by the Charitable are a body of commissioners expated by the Charitable their nature, objects, and administration, and the condition of the property belonging to them, with power dition of the property belonging to them, with power dition of the property belonging to them, with power ditions of private persons. Charters of the sovereign are those whereby he passes any grant to a person or body dition of the property belonging to them, with power ditions of the property belonging to them, with power ditions of the property belonging to them, with power ditions of the property belonging to them, with power ditions of the property belonging to them, with power ditions of the property belonging to them, with power ditions of the property belonging to them, with power difference of things done between man and man; and charters, are divided into those of the sovereign are those whereby he passes any grant to a person or body of the property belonging to them.

or the like. Charters of private persons instruments for the conveyance of lands. Charters of private persons are deeds and

instruments for the conveyance of lands.

CHARTERHOUSE (a corruption of Chartense, i.e. Carthusian), is an hospital, chapel, and schoolhouse in London, instituted in 1611 by Thomas Sutton, of Camps Castle, in the county of Cambridge. The site which it occupies was bought for a public burial-place during the great plague of 1349, by Sir Walter de Manny, who, in conjunction with the bishop of London, afterwards established here a Carthusian monastery. After the dissolution of the religious houses by Henry VIII., the property passed through various hands, until it was purchased for £13,000 by Thomas Sutton, who founded upon it, and richly endowed, an hospital chapel, and school, called by Fuller a "masterpiece of English Protestant and the state of the sible between the ages of ten and fourteen, and receive free board and education, there are a number who attend the school only during the day, or board with the The Charterhouse is regarded as one of the best schools in the metropolis, and many eminent per-

best schools in the metropolis, and many eminent persons have been educated here: among whom may be mentioned Dr. Isaac Barrow, Sir William Blackstone, Addison, Steele, John Wesley, Bishop Thirlwall, George Grote, W. M. Thackeray, and Sir C. Eastlake.

CHARTER-PARTY, is a mercantile instrument in writing (with or without sent), by which a party desiring to export goods from this country, or to import them from abroad, engages with some shipowner to take an entire vessel for the purpose, at a freight or reward thereby agreed for. Upon the execution of such an instrument the ship is said to be chartered or freinheld, and the narty by whom she is engaged is freighted, and the party by whom she is engaged is called the charterer or freighter. But where, instead of taking the entire vessel, the owner of goods merely bargains for their conveyance on board of her for freight (other goods being at the same time conveyed reagnt (other goods being at the same time conveyed for other proprietors), she is described not as a chartered but a general ship; and in this case no charterparty is usually executed, but a bill of lading only. It may be here stated that the word freight is sometimes synonymously used with that of eargo. (See Bill of Lading.)

CHARTISTS. tshurt'-ists, the name of a political party that sprang up in England after the passing of the Reform Bill, and were so called from their principles being embodied in a document termed the "Charter." The Reform Bill, while it conferred political power upon the middle classes, did little towards improving the condition of the working classes of society. The middle classes, too, had been assisted by the latter in their offort to obtain the franchise, and, having attained their object, they became callous or opposed to any extension of the like privileges to those beneath them in the social scale. The introduction of the new poorlaw, in 1635, was the first thing that caused any great law, in 1835, was the first thing that caused any great outery among the working classes against the purty in power, and in 1836 the "Working Men's Association" was formed in London. For some time the association did not receive much countenance; but the great commercial distress, the scarcity of work, and the dearness of provisions, that followed soon after, were severely felt by the people, and led to open and alarming demonstrations of their feelings. In the autumn of 1838 monster meetings of the working classes were convened at Birmingham and other parts of the manufacturing counties, and highly inflammatory speeches were addressed to them. The Charter was drawn up by a committee of six members of parliament and six by a committee of hix memoers of parameter and six members of the Working Men's Association. The principal points of the Charter were—1. That every male inhabitant of the United Kingdom 21 years of age and of same mind, provided he be a native of these age and of sahe mind, provided ne is native of these realins, or have lived upwards of two years in the country and been naturalized, and be unconvicted of felony, shall be entitled to vote in the election of mem-bers of parliament; 2, that the United Kingdom be divided into 300 electoral districts, so as to give uniform

his services. There is nothing contained in the charter that had not been advanced and advocated before. early as 1780 the duke of Richmond introduced a bill early as 1780 the duke of Monmond introduced a full into the House of Lords for annual parliaments and universal suffrage. Unfortunately the majority of the Chartists did not confine themselves to the points of the Charter. Many of them advocated an entire redistribution of property. Ignorant of the principles of political economy, they demanded the establishment of a new relationship between capital and labour, and adopted the cry of "A fair day's wages for a fair day's work." Many of them, further, took up the view that they might, if necessary, employ physical force to obtain their ends. In May, 1839, a petition, signed by 1,280,000 persons, was presented to parliament in favour of the Charter, and during that year serious riots took place in various parts of the country, and various of the ringleaders were imprisoned. An outbreak at Newport, in the month of November, resulted in the death of ten persons and the wounding of many more; and three of the leaders, Frost, Williams, and Jones, were sentenced to death; but their punishment was afterwards commuted to banishment. The stringent meaning and the second of the sentence and the second of the sentence and the sen the Charter. Many of them advocated an entire rewas afterwards commuted to banishment. The stringent measures adopted by the government at length served to repress these violent commotions; and though, in 1842, and again in 1849, outbreaks took place, these were of a less serious nature, and were speedily put down. Chartism may now be said to be a contraction of the contraction of belong rather to the past than to the present, and those who are in favour of the principles of the Charter are who are in avour of the principles of the context we content to advocate their views in a peaceable manner. In nothing is the social progress of the country more marked than in the great change that has taken place in the character of the working classes within the last

quarter of a century.

CHARTREUSE, LA GRANDE, shar-trewz', the chief monastery of the Carthusian order in France. It was founded by Bruno of Cologne, at Grenoble, in 1084. Expelled during the Revolution, the monks

returned to their monastery in 1814.

CHARTULARY, tshort-tu-litere (Lat. chartularia), ori-ginally denoted a collection of charters, and was afterwards applied to the books in monasteries, &c., in which such charters were entered. These books were common even as early as the 10th century, and they have been of great service in historical and genealogical rescarches. The officer who was intrusted with the care of the charters was also called chartulary.

CHASE, tshaise (Aug.-Nor.), is a franchise granted by the crown to a subject, empovering the latter to keep, for his diversion, within a certain precinct so called, the wild animals of chase (which, in a legal sense, are the wild animais of chase (which, in a legal sense, are the same with those to which the right of forcest ex-tends); but not an horizing the establishment of forest law within such precinct. It has been described as, "a smaller forest in the hands of a subject, but not governed by the forest laws." It differs from a park in that it is not inclosed, and likewise in that a man may have a chase in another man's ground as well as in his own: being, indeed, the liberty of keeping of beasts of chase or royal game therein, protected even from the owners of the land, with a power of hunting them

Champin, tshus-e-dim' (Heb., Pietista), is a name given collectively to a whole class of Jewish sects, but, more strictly, it is applied to a modern sect which sprang up in Poland towards the middle of last century. Chasidim and Zadikim were the names employed to designate the two great divisions of the Jewish people which arose after the Babylonish captivity; the former being in favour of certain innovations in the law of Moses, the latter being for a strict adherence to the law as it stood. From the former arose all those naw as it stood. From the former arose all those sects that receive traditions and explanations in addition to the law of Moses, as the Pharisees; to the latter belong the Sadducees, Essenes, &c. Of the modern sect of Chasidim, the founder was one Israel Baalsham, a Jewish rabbi. He gave himself out as having the true knowledge of the sacred name, through which he was andward with miscaulous rowsers and which he was endowed with miraculous powers, and constituencies of about 20,000 voters each; 3. that the voting be by ballot; 4. that a new purliament be elected annually; 5. that no property qualification be required for members of parliament; and 6. that every votes. This sect is very numerous in Poland, Rummember be paid £500 a year out of the public treasury for gary, the Danubian principalities, and Turkey.

CHASING, taked sing (from Fr. enchases), a term employed to denote the art of working raised or halfraised figures in gold, silver, and other metals. distinguished from soulpture and carving, which refer to the same art when applied to marble, ivory, wood, &c. Silver is the metal which has always been most generally used for chasing.

CHASSEROT RIFLE, shase'-po, is a breech-loading rifle and the principal arm of the French infantry. On the recommendation of Marshal Niel, minister of war in 1866, the arm was given out in the September of that year, as an experiment, to the battalion of Foot Chasseurs of the Guard. Its distribution to the other regiments of the Guard only commenced at the close of March, 1807; and, by degrees, as the manu-facture advanced, the delivery of these rifles was ex-tended to the infantry of the line, the whole of which was supplied in little more than a year from the first From the outset the weapon was regarded by the French army and the military authorities as most efficient. At the outbreak of the Franco-Prussian war, the French were firmly imbued with the notion way to the needle-gun of the enemy. The two arms fairly contrasted, the Chassepot is, perhaps, superior in some respects to the needle-gun; but whatever advantages were possessed by the former over the latter, were counterbalanced by the superior steadiness and skill of the Germans. The regulation range of the Chassepot is 1,000 metres, although it may easily extend to 1,100. The projectile, fired at a velocity of 450 mètres per second, has a passage so low, that at a distance of 230 mètres the ball does not rise much a distance of 230 literes the ban does not rise much above the line of aim, which result is a most favour, able condition for the efficacy of fire. From the rapidity with which the arm may be loaded in any position—kneeling, scated, lying down, as well as standing,—the men are able to fire seven, eight, or even ten shots per minute, taking aim, or fourteen without shouldering the gun. With the old musket the maximum range was but 600 metres, the velocity 324 mètres per second; and the men under normal conditions were only able to fire two shots per minute, whilst, as they are forced to load standing, they were all the time exposed to the enemy. With respect to precision of aim, the advantages are not less remarkable. Experiments made show that, in good hands, the Chassepot is a first-class arm; but, in the late struggle, we have seen the natural advantages of the weapon sacrificed through the unsteadiness, the hurry French army in general. The weapon is named after its inventor, M. Antoine-Alphonse Chassepot, head its inventor, M. Antoine-Alphonse Chassepot, head viewer of military arms in Paris. The mechanism of the breech parts consists of the breech, the breech bolt, the movable needle-guide, the holding and re-leasing apparatus for effecting the discharge of the gun, the coiled spring, the needle-holder or head, and the needle. At the right-hand side of the breech there is an opening to permit of the introduction of the cartridge. The mechanism for holding back the needle consists of two small pieces, a lever and a catch, connected together by a screw, and acted upon by a spring. By a simple arrangement, pressure from the trigger is transmitted to the catch, and thereby the releasing of certain parts effected, the result being that the colled spring is brought to act upon the needle. A breech-bolt serves to open and close the chamber to allow of the insertion of a cartridge. A chamber to allow of the insertion of a cartridge. A knob, or handle, on this bolt serves for moving it. The arm is loaded as follows:—The index finger is placed behind the guard, and the thumb upon a raised ronghened portion. The main- or top-piece of the releasing apparatus is drawn back, together with parts immediately connected therewith. To open the arm, the knob or handle of the breech-bolt is turned from the total the part of the described the second of the procedule of the procedule of the place of the place of the procedule of the place right to left, and the bolt then drawn back; then a right to lett, and the bolt then drawn back; then a cartridge is placed in the barrel by the opening at the right of the breech. To close the arm, the breech-bolt is pushed forward, and its knob or handle re-turned from left to right. In order to put the piece in the safety-notch after the breech has been closed, it is necessary, by turning the knob, to place the releasing apparatus in relation with the smaller of two longitudinal slots of the bolt, then to move the re-

#### Chattels

leasing apparatus until its serew reaches the hostonic this slot. When it is required to fire the gun, it is only necessary to close the bolt entinely and to pull the trigger. The Chassepot cartridge consists of air parts, —viz., the priming, the powder-case, the powder, the pasteboard wad, the ball-case, and the ball. The priming consists of a copper cap, like the ordinary military cap, but of smaller dimensions. In the bottom there are two holes dimensions. tom there are two holes diametrically opposite each other, for giving passage to the spark. The fulminating powder is placed at the bottom of the cap. A small plug of cloth or wax covers it, so as to preserve it from outward blows. The cap is then covered with a thin washer of brass or other suitable material, which is pasted upon paper for forming the base of the cartridge, and the priming is thus complete. The powder-case is formed from a rectangular piece of paper, rolled upon a mandrel, and pasted at its edges. When the case is dry, the priming is inserted by a mandrel, after which the end of the case is pasted. mandrel, after which the end of the case is passed. The case being thus prepared, the charge of powder is inserted, and is pushed down gently to give rigidity to the cartridge. A pusteboard wad is next placed on the powder; it is formed with a hole, into which the twisted end of the paper of the case is inserted, the excess paper being cut off. The ball-case is composed of a paper jacket, rolled twice round a conical mandrel and pasted at the base only. After placing the ball in its case, this case is connected with the powdercase by a string or thread round a groove on each case, a slight distance behind the wad. Finally, the cartridge is greased. The reduced size and weight of the Chassepot bullet enables a soldier to take the field with 90 rounds of ammunition, as compared with 60 rounds of the old muzzle-loader rifle.—Ref. The Mechanics' Magazine, vol. xvii.

CHASSEURS, shas'-surs (Fr. chasseur, a huntsman), a name given by the Freuch to bodies of light infantry which act as skirmishers and sharpshooters. They correspond pretty closely with our own 60th regiment, or rifle brigade. The name was originally given by the French to some troops raised in 1815, in imitation of the jügers of the Austrian army, who were chiefly chamois-hunters of the Tyrol, and unerring marksmen as well as active and althetic mountainers. The French chasseurs were of two kinds,—cavalry and infantry; but now the term is more particularly applied to a body of men called Chasseurs de Fincennes, who were carolled and armed with rifles about 1835, and quartered at Vincennes. The chasseurs of the Sardinian army are called Bersaglieri. In the Crimes, the bersagileri of the Sardinian contingent attracted con-siderable attention on account of their activity and peculiar dress, which is soldierly in appearance although easy and comfortable. Garibaldi's chassaurs, that fook a prominent part in the war between France and Sardinia on the one side, and Austria on the other, in 1859, and the campaign against Francis II. of Naples, in 1860, are known as Cacciatori dei Alpi, or Alpine hunters.

CHASURLE, tshus' u-bl (Lat. easula, or presula), the outer dress formerly worn by the priest at the altar, and it seems to have succeeded the Roman togs. It was a circular piece of cloth, with a hole in the centre to admit the head, and it fell down so as to completely cover the body of the wearer. It is not now used in the English church, though prescribed in the rubric of Edward VI.'s First Book to be worn indifferently with the cope. It often appears on the older sculptures and brasses.

and orasses.

Chateau, shit-o' (Fr. château, Lat. castellum, a castel), a term formerly applied to the fortified residences of the French seigneurs. It is now generally applied to the large and more sumptuous country residences of the aristocracy. The word enters into the composition of the names of many towns and districts in Tanana. tricts in France.

CHATELS, ishāu-tels (Old Fr. catals, catels; chatels, movables of any kind), is a term used to express any kind of property which, having regard either to the subject-matter or the quantity of interest therein, is not freehold. The appellation was originally derived from the technical Latis word catalla, which, among the Normans, primarily signified only beasts of huabandry, or, as we still call them, cattle; but, in a

secondary sense, was applicable to all movables in general; and not only to these, but to whatever was not a fief or fend; to which, among the Normans, there were two requisites,—a given duration as to time, and immobility with regard to place. And it is in this latter more extended and negative sense that our own law adopts the term, considering as a chattel whatever amounts not to freehold, which, like the Morman flef, requires immovability in respect of the subject-matter, and a given degree of duration, that is, a duration for a life at least, either absolute or detypinable on a contingency, as regards the quantity of interest or estate. Any estate in lands and tenements which amounts not to freehold, is, consequently, a chattel; but inasmuch as it concerns, or, according to the technical expression, savours of the realty, it is denominated a chattel real, in order to distinguish it from things which have no concern with the realty, viz., mere movables, and the rights connected with

viz., mere movales, and the rights connected with them; and such things as these are, on the other hand, often described as chattels personal.

Calvica, tshāv.e.kd, in Bot., a gen. of plants belonging to the nat. ord. Piperacca, the Pepper fam. The dried unripe spikes of C. Rorburghii constitute the long pepper of commerce, which is imported from our Indian possessions; those of C. officinarum form the lower present used in America, character from the long pepper used in America, obtained from the long pepper used in America, obtained from the Dutch colonies. Long pepper contains an acrid resin, a volatile oil, and a peculiar crystalline alkaloid called Piperine. It resembles black pepper (see Piper) in its effects, and is used for similar purposes. Dried alices of the root and stem are employed medicinally in India under the name of Pippula Moola. Other species of this genus as C. chala under the and valvative. anus under the name of Pipputa Moola. Other spe-cies of this genus, as C. chaba, pepuloides, and sylvatica, have similar properties, and are used in India. The leaves of C. Betle, betel-pepper, and C. Siriboa are ohewed by the Malays and other Rastern races with slices of the betel-nut and lime. (See Betel.)

CHECKMARE. (See CHESS.)
CHEEKMARE. (See CHESS.)
CHEEKMARE. (Sax. cese, or cyse).—Cheese is the
curd of milk salted, pressed, and dried. Milk is
composed of three parls,—the oily or fatty portion, commonly known as cream, and which separates on standing, being lighter than the rest, and the curd, which remains dissolved in the whey until it is coagulated by some soid. In the manufacture of cheese, the ourd is supplied by the reunet, which, being the dried stomach of the calf, contains a large amount of gastric juice, and appears to be the natural milk-curdle. It is prepared by salting and drying the inner membrane of the atomach of a sucking calf. When required for use, a piece is soaked for some hours in water or whey, and the whole added to the warm milk that is to be curdled. When the curd has coagulated, it is sepacurdled. When the curd has coagulated, it is separated from the whey by straining, and pressed in a ring or hoop, from which it is continually removed and wiped to remove all superfluous whey. The colour of English cheese is due to arnotto, which is added to the milk before coagulation. Bath cream and Yorkshire cheeses are soft, and keep but a short time; Stilton is intermediate; and Cheshire, Gloucestershire, and Parkshire, the desire of the control o mesan are hard, and intended for long keeping. The variety of colour and flavour in cheese results from difference of pressure, length of time in keeping, varying proportion of salt, and many other circumstances.

CHEESE-HOPPER, CHEESE-JUMPER, or CHEESE-FLY. -In Nat. Hist., a name applied to a small black insect of the Beetle tribe, with whitish wings, margined with black. It is furnished with an admirable instrument for depositing its eggs in an ovipositor, which it can thrust out and extend to a great length, so that it can penetrate to a considerable depth into the cracks of cheese, where it lays its eggs, two hundred and fifty-six in number. The magget is provided with a couple ax in number. The maggot is provided with a couple of horny, claw-shaped mandibles, which it makes use of, both for digging into the cheese and for moving itself, being destitute of feet. By bending itself into a circle, it can lesp to a considerable distance. In Oglivie's Imperial Dictionary may be seen a drawing of the fly and the maggot.

Of the my and the maggot.

CHEGOR, or CHIGOR, thkey-o (Pulex penetrans), a their component parts.—Spectrum Analysis, which is small black flea, peculiar to South America and the their component parts.—Spectrum Analysis, which is must be composed to the recognition of elementary substances by means of certain lines in the prismatic spectrum of a lamp, in the English flea, it becomes a mild and inoffensive the flame of which their compounds are burnt. See

insect beside the terrible chegoe, which is not only troublesome, but dangerous. This insect burrows in and under the skin, and there deposite its eggs, the result being the most painful ulcers. Waterfor this us that on the plantations of Guines an old woman, known as "Granny," is specially retained to mind the little children, and keep down the chegoe. Every evening she examines their feet (the part generally attacked), and after grubbing out any chegoe she may find, rubs into the hole lime-juice and cayenne peoper.

pepper.
CHEIBOMANCY, OF CHIROMANCY, ki'-ro-man-se (Gr. cheir, the hand; manteia, divination), divination by the hand; the art or practice of attempting to foretell events, or to discover the disposition of a person, by inspecting the lines and lineaments of his hand.

CHEIROMYS, ki'-ro-mis, the scientific name of the Aye-aye. (See Aye-aye.)

CHEIROPTERA, ki-rop-te-ra (Gr. cheir, the hand, and pteron, wing), in Nat. Hist., an animal whose anterior toes are connected by a membrane, and whose feet thus serve for wings, as is the case with the bat. The animals which belong to this wing handed family are such as are comprised in the Vespertilio of Linuwus. They are capable of sustained flight, and are distinguished by a folding extension of the membranous skin, which, rising from the sides of the neck, is spread between their fore feet and their flagers.

18 spread between their fore teet and their lugers.
Chenorisativit, ki-ro-the're-um. The German naturalist Kaup refers to the footprints of a mammiferous animal found in the old red sandstone of Hildburghausen under this title. To the same origin many similar remains in England have been referred. Professor Owen is of opinion that the animal was reptilian. In all probability it was a batrachian rep-

reptilian. In all probability it was a batrachian reptile. The footprints occur with ripple-marks on the flaggy red sandstones of the Mersey, and also in Dumfriesshire.—Ref. Eng. Cyclo.—Nat. Hist. CHEIROSTEMON, ki-vos-te'-mon (Gr. cheir, the hand; stemon, a stamen), in Bot., a gen. of trees of the nat. ord. Stereutiance. The species C. platonoides is the Handplant of Mexico, which derives its common name from the remerkable superspace of its flowers: the authers the remarkable appearance of its flowers; the anthers and style being so arranged as to resemble a hand fur-

nished with long claws.

CHELIDONIUM, kel-i-do'-ni-um (from Gr. chelidon, a swallow, the plant being said to flower at the coming, and dry up at the departure of the swallow), in Bot., the Celandine, a gen. of plants belonging to the nat. ord. Papaveraceæ. The species C. majus is found in waste places and on old walls in this country, and may waste places and not waste in this country, and may be recognized by its small reliow flowers, and the orange-coloured juice which exudes from its stem when plucked. This juice is poisonous, and is a popular application for the cure of warts. It has been used with success in the treatment of opacities of the cornea,

and has been administered internally as a stimulant. CHELIFER, kel'-i-fer, in Nat. Hist., a genus of arachnida, bearing a close resemblance to acorpions. These remarkable animals are very small, and have the appearance of miniature tailless scorpions. They run rocks by the seaside. They also find a location in the They also find a location in the barks of trees, and among papers and old furniture in houses. They feed upon insects, and are met with in all parts of Europe.—Ref. Eng. Cyclo.—Nat. Hist. CHELONIA, kc-lo'-nc-ü (Gr. chelonia, a tortoise), in Nat. Hist., the numerous and highly interesting order of reptiles in which are comprised the tortoises and the turtles. (New Torgards.)

the turtles. (See TORTOISE.)
CHEMICAL ANALYSIS, kem'-i-kül.—For theoretical information on this subject, see ANALYSIS. The pracitical portions of it are treated under the heads of Dialysis, which is the separation of crystalline and non-crystalline constituents of solutions by means of non-crystalline constituents of solutions by means of the intervention of an absorbing disphragm; —Inorganic Analysis, the detection and separation of the constituents of products not being either of an animal or vegetable nature; —Organic Analysis, which is the resolution of animal and vegetable substances into their component parts; —Spectrum Analysis, which is the recognition of elementary substances by means of cartain lives in the primatic spectrum of a lamm. In

#### Chemical Formula

elso Qualitative Analysis, which is the accurate de-tection of the components of a substance without reference to their proportions;—Quantitative Analysis, the separation and weighing of the constituents of a compound; — Volumetric Analysis, the quantitative estima-tion of the component parts by means of measured test solutions of a uniform strength. (Consult also BLOW-FIFS and RE-AGENT.) The best text-books on these subjects are enumerated at the end of each article.

CHEMICAL ATTRACTION. (See AFFINITY.)
CHEMICAL FORMULE.—The alchemists, for the sake of mystery, employed the signs of the different planets to represent the various metals. Modern chemists, for the sake of convenience and brevity, have given to every element one or two letters called symbols, which are used, in conjunction with figures and algebraic signs, to express every known compound. (For the symbols of the different elements, see SYMBOLS.) The principle apon which modern chemical notation is founded, is that each symbol indicates one or more atoms of the element it represents: thus, C, C<sub>a</sub>, C<sub>a</sub>, indicate respectively one, two, and twenty-seven atoms of carbon. Two symbols, placed side by side, signify that they are in close chemical union: thus, AgO signifies a com-pound containing an atom of silver united to an atom of oxygen. A comma, separating two or more groups of symbols, must be taken to mean that they are not in such intimate chemical union that the groups cannot be separated without decomposition: thus AgO, NO, represents nitrate of silver, which, by certain treatment, can be separated into AgO, oxide of silver, and NO<sub>5</sub>, nitric acid. The sign plus + signifies that the union is still weaker: thus, AgO, NO<sub>5</sub> + HO means nitrate of silver united to an atom of water, HO. A number placed on the left of a group of symbols sigor plus, is to be multiplied by it: thus, KO,2CrO, signifies that one equivalent of potash is united with two of chromic acid. Sometimes the group to be multiplied is inclosed in a parenthesis:  $3(\text{HgCy}) + 2(\text{KO}, \text{SO}_s)$ means that three equivalents of cyanide of mercury are united to two of sulphate of potash. Formulæ may be empirical or rational,—the former giving merely the constituents of a compound, the latter indicating the manner in which they are grouped. It is evident, therefore, that a compound can only have one empirical formula, while its rational formulæ are as numerous as the theories of its composition. Alcohol, for instance, is represented empirically by the formula CAH<sub>3</sub>O<sub>2</sub>. Rationally, it may be represented as the chylate of water, HO,C<sub>4</sub>H<sub>3</sub>O; the hydrated oxide of ethyl, C<sub>4</sub>H<sub>4</sub>O, HO; as a compound of olefiant gas and two equivalents of water, 2HO,C<sub>4</sub>H<sub>3</sub>, and so on, ad infinitum. Brackets are used to denote substitution compounds; that is, compounds in which one element, or group of elements, has been substituted for another without materially affecting the character of the compound.

NH: H represents ammonia. NH represents platinamine, or ammonia in which

an atom of platinum has replaced an atom of hydrogen. In like manner,

 $\left. egin{array}{c} \mathbf{H} \\ \mathbf{H} \\ \mathbf{C_4H_8} \end{array} \right\}$  is the formula of ethylamine, or ammonia with

an atom of hydrogen, replaced by an atom of ethyl. Two changes have been lately introduced into chemical formulæ that it will be well to notice;—one in which dashes are used to denote the atomic power of the element; the other, a line through a symbol, to signify that its atomic number has been doubled. Bi''' means that bismuth has a tristomic power in the way of forming substitution compounds: thus,

N.H. H. Bi''' is an ammonia compound in which three

equivalents of hydrogen are replaced by one of bismuth, that metal having a triple uniting power. This

## Chemical Nomenclature

notation originated with M. Gerhardt, an eminen French chemist, whose views on the subject are daily gaining ground, and are fully explained under the head of Gerhard's Notation. Chemical Nomenclatures.—The present system of

chemical nomenclature is due to the immortal Lavoisier. and will ever remain a monument to his marvellous powers of systematic classification. It is based on the great principle that the name of a compound should, as far as possible, express its composition and proper-ties. The names of many of the simple elements we have received from the alchemists, and were formed on no definite plan. Those elements which have been lately discovered have been named either from some characteristic property possessed by them, or from some word indicating their source. Metals, as a rule, terminate in ium, as potassium, thallium, &c.; metaloids in on, as boron, silicon, &c.; gases in one or gen, such as chlorine and oxygen. In several instances theory grounded on insufficient facts has been allowed. to influence the name of an element; for example, oxygen was named from oxus, acid, and gennae, to generate; the Lavoisierian theory being that no acid could exist without oxygen. Subsequently, however, it was found that oxygen occurred in all bases, and that many acids existed that contained hydrogen in its The Lavoisierian nomenclature is founded on stead. the fact that when a compound of two elements is submitted to the action of the voltaic current, these being attracted by the negative pole, and the other (electro-negative body) going to the positive pole. As a rule, it was found that the metalloids were electro-negative and the metalloids were electro-negative and the metalloids represented the metalloids were electro-negative and the metalloids represented the metalloids were electro-negative and the metalloids represented the metalloids were electro-negative. combinations of two elements are termed binary compounds, and fall naturally into two divisions,—bases and acids. Bases always end in ide, and are compounds of different proportions of a metal with a metalloid. The proportion of the metalloid is indicated by the addition of a Greek or Latin numerical particle: thus we have the protoxide, sesquioxide, binovide, and ter-oxide of various metals, indicating that these com-pounds contain one, one and a half, two, and three doses of oxygen to one of metal. When the metal is to excess, Greek prefixes are used: we have, for instance, the dinoxide or trisoxide of a metal, showing that the metal is in a double or triple dose. Generally the prefixes sub and per are used to indicate the excess of metal over metalloid, and vice verad. The termination used in several cases, such as sulphuret, phosphuret, &c.; but it is now abandoned in favour of the termination ide. The compounds of the metalloids with each other are named on the same metalloids with each other are named on the same metalloids with each other are named on the same principle. When the dose of oxygen is large, the compound is generally possessed of acid properties: thus we have Cr<sub>2</sub>O<sub>3</sub>, the sesquioxide of chromium, which is a base; but, by increasing the oxygen, we obtain CrO<sub>3</sub>, which is an acid capable of forming salts with bases. The amount of oxygen contained in oxygen, which is a superior of the oxygen oxygen of the oxygen oxygen of the oxygen oxygen of the oxygen ox acids is indicated by the termination to or our, or the prefixes hypo, under, or hyper, above. A few examples of bases and acids will illustrate this:—

Pb.,O	Dinoxide or suboxide of lead. Protoxide or oxide of copper.
Fe.O	Sesquioxide of iron.
MnO	Binoxide of manganese.
AuO <sub>3</sub>	Teroxide of gold. Pentachloride of phosphorus.
PS	Dodecasulphide of phosphorus.
C10	Hypochlorous acid,
NO	Nitrous acid.
NO <sub>5</sub>	Hypochloric acid Nitric acid.

Certain metalloids, such as sulphur and hydrogen, combine with other metalloids to form acids: for instance, we have-

HC1	Hydrochloric acid.
HRe	Hydrobromic acid.
A . Q	Sulpharsenic acid.

The compounds of acids with bases are always indicated by the termination or prefix of the word giving the name of the acid. Acids ending in our and to form sales

**R 3** 

## Chemical Nomenclature

ending is ite and ate, the prefix being, of course, pre-served. A few examples of this will suffice:—

Sulphate of iron = sulphuric acid + oxide of iron Hypophosphate of lead = hypophosphoric acid +

oxide of lead. Sulphate of copper = sulphurous acid + oxide of

copper.

Hyposulphate of cobalt = hyposulphurous acid +
oxide of cobalt.

When the oxide with which the acid is united is a pro-When the oxide with which the acid is united is a protoxide or peroxide, the prefixes proto and per are added; for instance, the pernitrate and protonitrate are the nitrates of the protoxide and peroxide of the metal. When the dose of acid is greater or less than the base, the prefixes sub, sesqui, bi, are used; as the subcarbonate, bicarbonate, and sesquicarbonate of soda. In double salts the name of the base only is repeated; as the tartrate of potash and soda. There are a few the tartrate of potash and soda. There are a few instances of acids and salts which have the same composition, but different properties. They are dis-tinguished from the ordinary kind by the prefix meta; thus we have phosphoric acid and metaphosphoric acid. The prefix pyro signifies that the acid or salt has been obtained by heat; for instance, we have pyrogallic acid, produced in this way from gallic acid. In organic chemistry the nomenclature is in many cases somewhat confused. This is not owing to any want of proper principle in the formation of new words, but rather to the differences of opinion existing amongst rather to the differences of opinion existing amongs chemists as to the composition of the substances indicated. Thus anilino is cylled phenylamine, phenylia, and benzidam, by different chemists, who each have a theory touching its composition. Organic chemistry may be defined as the chemistry of organic radicles or compounds containing carbon, which act in every way as elements. Organic radicles generally terminate in yl, and mostly contain carbon, hydrogen, and oxygen. Thus we have ethyl, the radicle of ether, which forms oxides and salts in the same manner as iron, lead, or any of the purely elementary bodies. (See Organic Transport of the process of RADICLES.) There are also compounds corresponding to the electro-negative bodies oxygen, hydrogen, nitrogen, &c. We have, for instance, cyanogen and amidogen, which form cyanides and amides, similar in their properties to chlorides and oxides. The termination of or ole is generally applied to neutral compounds of carbon ole is generally applied to neutral compounds of carbon and hydrogen, possessed of neither basic nor acid properties, and are mostly liquids; such as bensol, pyrol, quinol. The termination in is applied to other neutral substances, generally solid; such as paraffin, maphthalin, and albumin. Those ending in ine or in are generally bodies allied to the alkalies in their properties. We have, for instance, quinnine or quinning strychnine or strychnia, aniline, &c., which form salts with acids. Many of those which end in anine resemble ammonia, and are considered substitution resemble ammonis, and are considered substitution compounds of that body, in which one or more equivalents of hydrogen are replaced by an organic radicle. Thus we have ethylamine (Ethyl)C.H.

N, in which one equivalent of hydrogen is replaced by one of ethyl. If two or three equiva-lents are replaced, the prefix di or tri is added to the word; for instance, we have dimethylamine and triword; for instance, we have amentycamine and repropylamine, the composition of which is plainly indicated by their names. When the hydrogen is replaced by different bodies, their names are prefixed. We have, for instance, ethyl-methyl-amylamine, which consists of one equivalent of nitrogen united to one sach of the organic radicles ethyl, methyl, and amyl. There are also substitution acids as well as bases; such as brombeneoic acid and chloracetic acid, in which bromise and chlorine are substituted for an equivalent of hydrogen. Thus, although these names appear unintelligible and unwieldy to the superficial observer, they are as easily understood by the chemical student as any term including several nouns and adjectives would be to an ordinary individual. In this respect chemical nomenclature bears a very fiscourable contrast with that belonging to mineralogy and bottomy, the sciences being disfigured by the introduction of the principles of which the substances black art, were at any rate its most ardent wetaries. each of the organic radicles ethyl, methyl, and amyl.

## Chemistry, History of

are called after their discoverers, or some great man whom the discoverer wishes to flatter, instead of bear-

ing names indicative of their proporties or origin.

CHEMIST AND DRUGGIST, kem'-ist, a term commonly applied to any person who has been apprentised to, or regularly educated by, a vendor of drugs or dispenser of medicines, but who does not set as a visiting apothecary or surgeon. In this country the chemists and druggists constitute a very important and useful class. They sell medicaments, simple, or compounded ac-cording to the prescriptions of medical men; and they also act as medical advisers for the benefit of the poorer classes. The right of chemists and druggists to prescribe even in the manner usually followed in what is called "counter-practice," has been often questioned by the literary organs of the medical profession; but the highest legal authorities declare that they may so far prescribe for customers as to advise with them as to the nature and author and authority and an organization. to the nature, and quality, and mode of application of the medicines which they are about to sell; that they may listen to the statements of the customers, and may suggest to them and recommend the commodities which will be suitable and beneficial, or dissuade them from purchasing or taking things applied for in ignorance. The advice given by the chemist and druggest is merely incidental to the sale and dispensing of his wares and drugs, and cannot, of course, be made the subject of a charge. Counter-practice has always been a recognized branch of the business of the chemist and druggist, and we do not find it prohibited by any clause in the Apotheoaries Act of 1815; on the contrary, we read that "all persons using or exercising the said trade or business, or who shall or may hereafter use or exercise the same, shall and may use, exercise, and carry on the same trade or business in such manner, and as fully and amply to all intents and purposes, as the same trade or business was used, exercised, or carried on by chemists and druggists before the passing of this act." Two societies have been established by the members of the trade; viz., the Pharmaceutical Society of Great Britain and the United Society of Great Britain and the United Society of Chemists and Druggists. The objects of each will be noticed under its title.

CHRMISTRY, HISTORY OF, kem-is-tre (Arab. kimia, the occult science; Fr. chimie, Ital. chimica).—There is, perhaps, no science the gradual progress of which is is, pernaps, no science the gradual progress of which is so easily traced from one step to another as the science of chemistry. The empirical mixing of two substances, possessing different properties, to form a third, differ-ing from either, must have commenced with the first peopling of the earth. The fact was transmitted to others who improved as it as the second control of the second contr others, who improved on it, and experimented on other similar bodies; and thus was a mass of practical information obtained, which gradually developed into chemical manufactures. The origin of chemistry is generally traced to Tubal Cain, the father of workers in metal, between whom and Hermes Trismegistus lies a period of obscurity of which we know nothing. Hermes is said to have been the inventor of alchemy, a notion not entitled to much credit. In any case, Egypt, which is said to have been colonized by his son Mizvaim, was the foremost chemical nation of the East; their glass, pottery, colours, and method of embalming their dead, bearing strong testimony to the fact of their being acquainted with chemical processes brought to a peng acquainted with chemical processes brought to a great state of perfection. The practical part of the science existed provious to the theoretical; but by degrees, as men began to think, they began also to-observe and theorize. Thinking men saw that a gross earthy matter, such as iron ore, became transmuted, as it were, by fire into a hard metallic substance, like What more rational, then, for them to suppose

Chemistry, History of Gradually, another notion stole in. The principles and practice of pharmacy became more general, and a specious logic was brought to bear on the fact that specious logic was brought to, hear on the fact that centain salts and liquors of a metallic nature assuaged pain and restored drooping vitality. It was then but one step further to go to find a compound that would prolong life indefinitely. Another object of pursuit was the universal solvent, or alkahest. The first practisers of alchemy were, no doubt, honest, serious men; but as time wore on, there arose a mass of impostors who found need dupos in available of the ware. who found ready dupes in avaricious people, who were ver ready to buy the secret of unbounded riches. this way there was formed a mass of almost unintel-ligible knowledge, carefully concealed from the vulgar by secret symbols and an absurd nomenclature. Through this accumulation of rubbish there ran some golden this accumulation of rubbist bleed an arms govern-veins; and we must never forget, that although al-chemy had its philosophers' stone and universal sol-vent, it also gave us a hundred salts and preparations daily used in our own laboratories. Towards the end of the 17th century arose a set of men whose brains were made in a better mould than those of their predecessors. Putting aside the idea of transmutation of metals, they turned their attention to the discovery of the principles that governed the formation and composition of bodies already in their hands, rather than to the pur-suit of chemical chimeras that might for ever clude their grasp. Paracolsus, though imbued with the fanciful doctrines of astrology and demonology, must always be regarded with reverence for his virtues and pity for his faults. He must ever be considered as the connecting link between the alchemists and chemists. A few of his researches will be sufficient to show that although full of the maddest hallucinations, he was one of those rare geniuses who have the power of lifting a science from the mire. He was the first to offer a true chemical explanation of the action of mercury, iron, and lead in the human system. He distinguished slum from copperas, showing that the former contained an earth, the latter a metal. He admitted the existence of other clastic fluids besides air. He was aware that animals could not live, and inflammable matters could not burn, without air. To him succeeded Van Helmont. who was the first to distinguish between acrial fluids or gases, as he called them. After Van Helmont came Boyle, the founder of the Royal Society, one of the most acute experimentalists that ever lived. His numerous experiments are marvels of accuracy, bearing even the test of our present knowledge. He and his contemporary Hook made great improvements in the air-pump, the invention of Otto Guericke, and paved the way to further discoveries. At the beginning of the 18th century come the names and discoveries of Beecher and Stahl, the founders of the phlogistic theory. They found that by heating charcoal with metallic oxides or calces, they were reduced to a me-tallic state. They further noticed, that when charcoal tallic state. They further noticed, that when charcoal was burnt it was entirely dissipated. Upon these was built in was distributed with the car to fear the facts they founded the theory that charcoal, or phlogiston, was a principle which united with the car to form the metal. This notion appeared to be further carried out by the fact that metals, when heated, are carried out by the fact that metals, when heated, are converted into calces; the explanation of which was, that the volatilized charcoal, or phlogiston, was consumed by the heat. This theory, which was the first general principle applied to the whole range of chemical phenomena, maintained its ground for some time, until the discoveries of Priestley tended to overthrow it, by proving that the calx, or oxide, of mer-cury, instead of gaining something by being heated, lost something, and that that something was oxygen. lost something, and that that something was oxygen. About this time Cavendish discovered hydrogen, and Rutherford nitrogen, experiment being heaped on experiment, and discovery on discovery, until the Stahlian theory gave way. It was succeeded by that of Lavoisier, the father of modern chemical science, who classified and arranged the known chemical facts into a system unparalleled for its precision, extent of view, and logical accuracy. His discoveries were few, but he reasoned on the discoveries of others with wonderful astuteness. From this moment chemistry marched onward with giant strides. It would be impossible to enumerate the whole of the discoveries that have taken place since the commencement of the present who classified and arranged the known chemical science, light of the facts disclosed in the investigation of the row and logical accuracy. His discoveries were few, but he reasoned on the discoveries of others with wonderful astuteness. From this moment chemistry is to obtain a good elementary manual, such wonderful astuteness. From this moment chemistry marched onward with giant strides. It would be imposmatched on a great properties of organic matter. (See Organic and Information of the properties of organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) See Organic matter. (See Organic matter.) when the properties of organic matter. (See Organic matter.) See Organic matter. (See Organ

science has progressed even in our own time. The application of the voltage current to the decomposition application of the voltaic current to the decomposition of the alkalies, by Davy, resulted in the discovery of a dozen or more new metals. The atomic theory of Dalton threw great light upon the composition of salts and acids. The invention of the present symbolic notation by Berzelius, and the determination of the elementary equivalents soon followed. In 1811 Davy worthwart he notice of Lavisia that a light Davy overthrew the notion of Lavoisier, that soids could not exist without oxygen, by proving that hydroculorio acid consisted only of chlorine and hydrogen. In 1812 Courtois discovered iodine; Balard followed soure time after with bromine. Element succeeded element until atter with bromine. Element succeeded element until they reached the number of sixty. All this time organic chemistry was making great progress. The vegetable alkaloids began to attract great stention; their analyses were made, and new theories founded on them. The early labourers, Liebig and Berzelius, threw great light on this branch of the science, which is even to this day the most attractive to many famous chemists. The development of the many famous chemists. The development of the theory of organic radicles has gone on increasing, fostered by the labours of Paraday, Laurent, Gerhardt, Hofmann, and a host of others, until it has assumed a mathematical precision unknown to any other branch of physical science. The investigations of organic mathematical precision unknown to any other branch of physical science. The invostigations of organic compounds by these philosophers have resulted in a complete change, both in the notation and nomenolature of mineral substances. This theory, which was founded by Gerhardt, will be fully explained under Gerhardts Theory. The last great discoveries have been spectral analysis, which has resulted in the addition of these new slavagets unkny list. tion of three new elements to our already bulky list;cesium and rubidium, by Mesers. Bunsen and Kirch-hoff, of Heidelberg, and thallium, by Mr. Crookes, a distinguished English analytical chemist. The researches of Graham upon the diffusion of salts in solution and in dialysis, or the separation of crystallizable and noncrystallizable substances in solution by means of an intervening displursm, are amongst the most brilliant discoveries of the age. The researches of Schönbein, Schroetter, Brodie, and others, on the allotropic states of bodies, seem to point to the compound character of the present elementary bodies. In fact, chemistry at the present day is making such enormous strides, that it can only be properly studied in the current scientific journals.

CHEMISTRY, PRINCIPLES OF.—Chemistry has been variously defined by different philosophers; that of Miller (Elements of Chemistry, vol. i.) being perhaps about the best;—"It is the province of chemistry to ascertain the nature of the different substances of which the universe is compassed to these their meters of the different substances of which the universe is composed, to trace their mutual reactions on each other, to effect new combinations of these components with each other, and to define the conditions on which the combinations existing around us are producible." The world and its inhabitants are us are producible." The world and its inhabitants are made up of some sixty-five elements or bodies, which have hitherto proved undecomposable. Their general description will be found under ELEMENTS; their particular description under their respective heads. The combinations of these bodies are described under BASES, SALTS, ACIDS, RADICLES; while the general laws which regulate their composition will be found under ATOMIC NUMBERS, AFFINITS, SRIES, TYPES, ATLOGRADIAN ISMORPHISM. ISOMERISM, POLYMOR-ALLOTROPISM, ISOMORPHISM, ISOMERISM, POLYMOR-PHISM, &c. Inorganic chemistry treats of the nature and properties of elements and compounds of mineral and properties of elements and compounds of mineral origin, and organic chemistry of those belonging to bodies of a vegetable or animal nature. The long-existing barrier between the two is, however, being gradually destroyed by the labours of Laurent, Gerhardt, Hofmann, Wartz, Odling, and others, whose brilliant discoveries prove every day more and more that we must read the chemistry of the rocks by the light of the facts disclosed in the investigation of the light of the facts disclosed in the investigation of the

much less expensive than those necessary for analysis, which is, after all, the highest branch of chemical menipulation. Besides this, in performing synthetical operations, the student insensibly acquires manipulation, and in addition finds himself, at the end of a few months, in the possession of a vast number of interesting specimens, which will serve for material when he finds himself capable of performing elementary analysis; whereas the results of analysis are generally thrown away. The best books for the chemical student are perhaps the following, the order indicating the sequence in which they should be read:—Fownes' Rudi-mentary Chemistry, Bernay's First Steps; Fownes' Manual; Odling's Manual. The latter is an exposition of the unitary system of Gerhardt.

Chemistry, as a fruited to Agriculture.—The object of the practical farmer is to raise the largest quantity of valuable produce from a given extent of land at the smallest cost, in the shortest period of time, and with the least permanent injury to the soil. Until recently, agriculturists endeavoured to attain these results by experiment and experience; it has, however, been demonstrated, that chemistry, geology, and chemical physiology, point out clearly the proper steps by which the main object may be effected. Agricultural chemistry, as a science, collects, investigates, and endeavours to explain all known facts in practical hasbandry. It also deduces principles from observation and experiments made in the field or the laboratory, which may be more or less applicable in all circumstances. With a knowledge of such principles the farmer can understand symptoms and appearances he has never before seen, and can adapt his practice to circumstances which have never before fallen under his observation. Agricultural chemistry also suggests improvements, and, probably, unthought-of modes of rendering the soil fertile, besides inducing the analysis of soils, manures, and vegetable products. Chemical physiology also explains how plants grow and are nourished, and how animals are supported and most cheaply fed.—Ref. Elements of Agricultural Chemistry and Geology, by J. F. W. Johnston.

CHENOTODIACEE, ke-no-po-de-ai'-se-e (Gr. chen, a goose; pous, a foot), iu Bot., the Goosefoot or Spinach am, a nat. ord. of diootyledonous plants, in the subclass Monochlamydea. There are 72 genera, which include 510 known species, distributed over all parts of the globe, but most abundant in extra-tropical regious,—herbs or undershrubs, with leaves without stipules, alternate, or, rarely, opposite; flowers minute, greenish, without bracts, perfect, polygamous or dichnous; calyx persistent, usually divided nearly to the base, imbricated; stamens usually equal in number to the lobes of the calyx, and opposite to them: overy superior or partly inferior, 1-celled, with a single ovule attached to its base, and a style usually in 2-4 divisions, rarely simple. Fruit an schænium or utricle, or sometimes baccate. Several plants of this order inhabit salt-marshes, and yield by combustion the sodals called barilla (which see). Many are esculent; as beet and mangold-wurzel (see Bern), spinach (Spinacia disrace), garden orach (Atriptex hortensis), and English mercury. (See Chenofodium). The seeds of there are nutritious. Several contain volatile oil, which renders them anthelmintic, antispasmodic, aromatic activates and stimular.

which renders them anthelmintic, antispasmodic, aromatic, carminative, and stimulant.

CHENCODIUM, ke-no-po'-de-um, in Bot., the typical gen. of the nat. ord. Chenopodiacea. The seeds of C. Quisoa contain; starch granules, which are remarkable for being the smallest hitherto noticed. They are known under the name of petty rice, and form a constant of the contains article of food in Peru. C. honus Henricus is the lish mercury, a plant formerly much used as a pottish mercury, a plant formerly much used as a pottish mercury, and in North America for their anthelmintic and antispasmodic properties. C. rulearia stinking goosefoot), an indigenous plant, is a popular stinking goosefoot, an indigenous plant, is a popular summenagogue. C. ambrosioides is employed in Mexico and Columbia as tea; hence it is commonly known as Mexican tea.

Mexican tea.

Mexican tea.

O'Mexican tea.

O'

whom a cheque is drawn is obliged to honour it if he has funds belonging to the drawer in hand. Until dishonoured, it must be regarded as payment. An ordinary cheque is made payable to a certain person or bearer. For purposes of safety and convenience the use of cross-cheques has been introduced. Two transverse lines are drawn across the cheque, and the words "& Co." are written between them. Payment of a cross-cheque can only be procured by passing it through another bank.

through another bank. OHERINGYER, ker-e-moi'-er, the name commonly given to the fruit of the Anona cherimolia. It has been described as the finest of all fruits, and is generally esten for dessert by the wealthy inhabitants of Peru and Brazil. It is sometimes called the cherimolia. (See Anona.)

(See ANONA.)
CHEREY and CHEREY LAUEEL. (See CERASUS.)
CHEREY and CHEREY LAUEEL. (See CERASUS.)
CHEREY, tsher'-ub (Heb., plural cherubim, mighty ones), the name of a particular order of angelic beings frequently mentioned in Scripture. They were placed with flaming swords to guard the garden of Eden when Adam and Eve were driven out of it; and when Moses was commanded to make the ark of the covenant, he was to place a cherub on each end of it, so as to cover the meror-seat with their wings. What the form was under which the cherub was here represented we have no certain account, and various conjectures have been thrown out on the subject. Many are of opinion that, as in Ezekiel's vision, it was composed of parts of aman, lion, ox, and engle. In art, cherubs are commonly represented by a child's head with wings, or as a human figure with wings at the shoulders, and wings also in place of the lower extremities.

place of the lower extremities.
CHENYIL. (See ANTHRISCUS.)
CHENS, takes (Fr. &ckees), an ingenious and intellectual game, played by two persons, each having at command sixteen pieces, made of wood, bone, or ivory, upon a board divided into sixty-lour squares, eight on each of the four sides. These squares are coloured red and white, or black and white, alternately, and the pieces of each player are of different colours. On either side there are eight superior pieces and eight inferior. The former consist of a king. a queen, two bishops, two knights, and two rooks or castles; the latter consist of eight pawns, or foot-soldiers. On commencing a game, the king and queen occupy the commencing a game, the king and queen occupy the centre squares of the first or royal line, and are supported in regular succession by a bishop, a knight, and a rook, while before each piece stands a pawn. In placing the board, it is always the custom, in this country, to place a white square at the player's righthand corner; and, in arranging the pieces, the queen is always placed on a square of her own colour. The pieces on the king's side are called the king's,—as king's bishop, king sknight; while those on the queen's side are similarly styled queen's bishop, &c. The pawns take their names from the pieces before which they stand; as, the king's pawn, king's rook's pawn, queen's pawn, &c. Every superior and inferior piece moves according to certain rules, and the success of the game depends entirely upon skill. A knowledge of the varied moves is acquired over the chess-board with comparative ease from any competent person. The queen is the most powerful piece on the board, while the king, from the nature of the game, which does not admit of his exchange or capture, is the most important piece; the game depends upon his safety by a competent authority as,—queen, 9.94; rook's 48; bishop, 3:50; kinght, 3:05; pswn, 1:00. Towards the conclusion of a game, however, the pawn rises in value. When the king is directly stracked by any piece or

Chaturanga, or the four members of an army; namely, elephants, horsemen, chariots, and foot-soldiers. Since that time the game has undergone many alterations. It passed into Persia from Hindostan, and then into It passed into Persia from Hindostan, and then into Arabia, where it was called Shatrang, or the king's distress. In the 8th century the Arabs introduced the game into Spain, and from thence it passed into the rest of Europe. Chess was unknown to the ancient Greeks and Romans, but it was played in England before the Norman conquest. The Eastern game differs in several peculiar points from the game played in Europe, but resembles the game played by the Saxons. The laws of chess are at present undecided and practiferatory. The hest books of reference are Saxons. The laws of chees are at present understand unsatisfactory.—The best books of reference are Staunton's Chess-player's Handbook, and Morphy's Games at Chess, edited by Lowenthal.

CHEST, in Anat. (See TRORAX.)

CHEST, MILITARY and NAVAL, tsheet (Sax. cist or cyst).—The term Military Chest is applied to the money

and securities which are held by the chief of the com missariat department during a campaign, to provide pay and provisions for the soldiers. The Naval Chest, or Chest at Greenwich, as it is sometimes called, is a fund to provide for the necessities of sailors who are unable to pursue their calling in consequence of any injury. Gratuities and pensions for a certain number of years, or for life, are given out of this fund. It was originated in the reign of Queen Elizabeth, the sailors voluntarily giving up a small part of their monthly pay to form the fund. The money thus obtained was de-posited in a chest kept for the purpose; whence the

CHESTNUT. (See CASTANEA.) CHETAH, OF HUNTING LEOPARD. (See LEOPARD.)

CREVALUER. (See CHIVALER)
CHEVALUE DE FRIER, shee'-o de freez' (Fr., horses of Friesland), long beams of wood or iron, bristling with spikes, that are passed through the beam at regular intervals, in alternate directions, at right angles to each They are used to defend the ditch or berme of any fortification during an attack, and to impede the advance of a storming party when entering a breach. These implements of warfare are easily carried with an These implements of warfare are easily carried with an army, and, in our service, consist of hollow cylinders of iron, about six feet long, pierced to receive the spikes or pickets, which are carried in the interior of the cylinder when the army is on the march. The origin of the name is uncertain; but it was probably first used by the Dutch during their protracted but successful struggle against Philip II. of Spain in the 16th century. 16th century.

CHEVRON, shev'-ron (Fr. chevron), in Her., one of the nine honourable ordinaries, occupying a third part of the field. It represents the raiters of a house, and shows that the person to whom the coat of arms in which it occurs was first granted, was the founder of his family, or had achieved some important and honourable undertaking. The diminutives of the chevron are the chevronel and the couple close.—In Arch., it is a zigzag moulding, a peculiar characteristic of Norman architecture.

CHEVEOUS, in Mil., stripes worn on the arm to dis-tinguish the various grades of non-commissioned officers. The sergeant-major wears four stripes, serjeants three, corporals two, and lance-corporals one. Light infantry, the light and grenadier companies of all regiments, and the guards and fusiliers, wenr the stripes on both arms. They are composed of gold lace surpes on rotal arms. They are composed of gold lace or white braid in the regular army; but in the volunteer service anything is allowed except gold lace. The stripes are worn with the point downwards, above the elbow, and are thus distinguishable from good-conduct stripes, which are worn with the point upwards below the albow. the elbow

CHEVY CHASE, tshev'-e-tshais, the name of one of the CHEVY CHASE, takev-c-takois, the name of one of the most famous of the old English ballads, narrating a hostile encounter that took place on the Scottish border between the two warlike families of Percy and Douglas. Percy, earl of Northumberland, had vowed to hunt for three days in the Scottish border without condescending to ask leave from Earl Douglas. He had with him 1,500 men, and Douglas brought against them 2,000. In the middle of the contest the two earls meet hand to hand. After fighting for some time, Douglas is pierced to the heart by an English arrow,

and Percy immediately after falls by a Scottish spear. Although the leaders were thus both sisin, the battle still reged with great fury, till only 53 of the English still raged with great fury, till only 53 of the Bragish and 55 of the Scottish remained. The event referred to in the ballad, though apparently different from the battle of Otterbourn, which took place in 1338, is probably the same, or at least the tragical circumstances attending the latter have been incorporated in it. The beauties of this balled have been criticised by Addison in the "Spectator" (Nos. 70 and 74); and Sir Philip Sidney said of it, that he never heard the old song of Peroy and Douglas but his heart was more moved than we at truncet. These greater was song of this balled as by a trumpet. There are two versions of this ballad, an ancient and a more modern, both of which are given in Percy's "Reliques of Ancient English Poetry."

in Percy's "Reliques of Ancient English Poetry."
CHIRO-OSCURO, or CHIROSOUGA, ke-ar'-o-a-ku'-ro, ke-ar'-o-a-ku'-ro (Ital. chiaro, light; oscuro, dark), that branch of painting which has for its object the combination and arrangement of the light and dark parts of a picture to the best advantage. Relief and depth, and what is generally called the effect of a picture, are produced by ohisrosouro. Leonardo de Vinci was the first who reduced the art of chiaroscuro to a system. Correggio aftorwards improved it practically; and it is said to have reached perfection under Titian. is said to have reached perfection under Titian. CHICA, a red dye. (See BIGNONIA.)

CHICA, OF MAIZE-BEER. (See ZEA.)

CHICKEN-POX, tshik'-en-pox, in Med., is the name given to an eruptive disease, usually of a mild nature, and bearing some resemblance to small-pox. Some are of opinion that it is only a mild form of small-pox, but it is generally regarded as a distinct disease. It is mostly confined to children, and is of a contagious mostly conuncd to children, and is of a contagious nature. The premonitory fever is very slight, and the vesicles are filled with a watery fluid, rarely with yellow matter or pus, and pass away in the course of four or five days, leaving only slight crusts or scales, which fall off without leaving any permanent mark. The disease is rarely attended with danger, and, generally, all that is necessary is to put the patient upon spare diet, and to administer a dose or two of some mild aperient.

CHICK-PRAL (SOC COURE)

to administer a dose or two of some mild aperient.

CHICK-PEAL (See CICER.)

CHICK-WEED. (See STELLARIA.)

CHICORY. (See CICENCHIM.)

CHIEF, tsheef (Fr. chef, from Gr. kephale, the head),
denotes the highest in office or rank, the head or principal part of anything.

CHEF, in Her., one of the nine honourable ordinaries, occupying the upper part of the shield and a third part of the field. When any charge or charges are borne in the upper part of the field, they are said to be in chief.

CHIEF JUSTICES, tsheef just tis (Fr. chef, chief; Low

CHIEF JUSTICES, tsheef just-tis (Fr. chef, chief; Low Lat. justiciarius, justice), are the principal judges of the courts of Queen's Bench and Common Pleas; the chief judge of the court of Exchequer being called the Lord Chief Baron. (See JUDGES.)

CHIEFTAIN, tsheef-tām (Old Fr. chefetain, from chef, chief), is the leader, captain, or chief of a troop, army, or clan, but generally of the last. The chieftains of the Highland clans of Scotland were the patriarchal and feudal heads of their respective clans. (See CLANS)

CHILBLAIN, tshil'-blain (Ang.-Sax.chill, cold; blain, a pustule or blister), is an inflammatory affection of the skin, occasioned by exposure to sudden alternations of heat and cold, and usually affecting the hands or feet. Young persons are more subject to it than adults, and females than males. The partis red and swollen, and is attended with heat and a great sense of itching. Chilblains are generally produced by persons holding their hands or fect to the fire immediately after they have been exposed to great cold. This is to be darefully guarded against, and a uniform temperature, as far as possible, nuaintained by the use of warm socks and gloves. The itching is best removed by frequently rubbing the part with some stimulating application, as camphorated spirits of wine. One of the best means of removing chilblains on the hands we have found to be washing them nightly before going to bed with warm water, which allays the heat and promotes the general circulation. If the parts should ulcerate, it is often very difficult to heat; but the best application to use is spermacht in others. attended with heat and a great sense of itching. Chil-

CHILDEBMAS-DAY, OF INNOCENTS' DAY, takil-der-

mas (Ang.-Sar.), an anniversary of the Church of England, held on the 18th of December, in com-memoration of the children of Bethlehem, slain by order of Herod.

Children, kil'-li-dists (Gr. chilius, a thousand), in Bool. Hist., was applied to those who believed that Christ was to come again and reign a thousand years (See MILLENIUM.) upon earth.

CHILLAD SHOT. (See SHOT.)
CHILLABS. (See CAPSICUM.)
CHILLERN HUNDREDS, tshill-tern hun dreds, is a portion of Buck-inghesmahire known as the Chiltern Hills. The stewardship of the Chiltern Hundreds is a nominal office under the crown, in the chequer, and serves the purpose of enabling a member of the House of Commons to resign his seat (which he cannot do unless in some way disqualified), it being regarded as a place of honour and trust under the crown. The office is resigned immediately afterwards.

CHIMES, tslames (Dan. kimer, to tinkle), a peal of musical bells placed in a church-tower, and either rung by hand or by machinery con-trived for the purpose. In the ordinary art of bell-ringing, melody is never thought of, mechanical order and succession are the only results simed at. In Belgium and Holland there are some very perfect

chimes.

CHIMNEY, tshim'-ne, the flue for conveying away the smoke of fires. The term is derived immediately from the French chemine, the feminine form of chemin, used to convey the idea of a narrow passe; but primarily the derivation is from the Latin caminus. A chimney, besides being an agent for the removal of smoke, also assists in the combustion of the fire by producing a draught. Simple as is the contrivance of a chimney, it was unknown in ancient times. Tomlinson considers that they were in use in England at some time previous to 1368; but the use of the curfew bell in preceding centuries indicates their absence, as the people were thus summoned to cover the fires that burned in pits in the centre of the floor, under an opening in the roof. That they were in common use in Venice during the 14th century we gather from the fact that a number of them were thrown down by the earthquake which occurred in that city in the year 1347. In England only in the year 1997. In Enganne, however, they were not in general use even as late as the time of Queen Elizabeth, when they were still only huxuries to be met with in the houses of the great. Nicholson, in nonnes of the great. Nicholson, in his Dictionary of Architecture, thus designates the various parts of a chimney and of the wall in which it is inserted:—"The opening facing the room, where the fire is put, is termed the fire-place: the stone, termed the pre-place; the sounce is called the hearth; that on the same level before the fire-place is termed the stab. The vertical sides of the opening, at the extremities of the hearth forming also ment of

### Chimney

funnel; that part of the funnel which continually contracts or diminishes in its horizontal dimensions contracts or diminishes in its horizontal dimensions as it ascends, is termed the gathering, or by some, the gathering of the wings; the long narrow tube over the gathering, or that part of the funnel which has its horizontal dimensions the same throughout the altitude of the chimney, is called the fine; that part between the gathering and the flue is termed

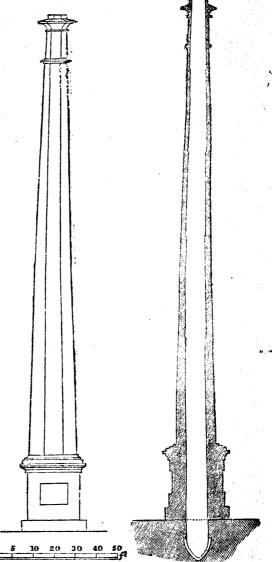


Fig. 1. ELEVATION.

Fig. 2. SECTION.

the hearth, forming also part of the wall of the apartment, are called jambs; the heart of the fire-place resting on the jambs, is apartment, and forms the sides of the funnel pare-called the mantel; the wholeshollow, from the fire-place to the top of the wall, is denominated the wall, the side of the funnel opposite the breast is 494

called the back. When there are two or more chimcalled the back. When there are two or more chimneys in the same wall, the divisions between them, or the solid parts of brick, stone, or metal, are called miths. A gable, partition, or party-wall containing a collection of chimneys, is termed a stack of chimneys. The turret above the roof, for discharging the smoke into the air of one, two, or a collection of chimneys, is called the chimneys. And it, and the horizontal surface, or the upper part of the said shalft, the chimneytop. When the parallel sides of the jambs are fixed with stone, marble, or metal, so as to form four obtuse top. When the paramet suce of the james at the with stone, marble, or metal, so as to form four obtuse angles, viz., two internally with the back, and two externally with the breast or side of the apartment, making the horizontal dimension of the outside of the fire-place of greater extension than that of the back, the facings are called corings." With regard to engine and factory chimneys, we are informed that the celebrated Montgolfier, the inventor of the fireballoon, was the first to examine the general principles of chimney-draughts, as applied in manufacturing establishments. Dr. Ure made a series of interesting and valuable experiments respecting the velocity of and valuable experiments respecting the velocity of air in large chimneys—in the breweries of Messrs. Tra-man, Hanbury, & Buxton, and at the machine-factory of Messrs. Braithwaite, and elsewhere, the results of which are to be found in the 6th edition of Ure's Dict. of Arts, Manufactures, and Mines. The limits which are to be found in the 6th edition of Ure's Dict. of Arts, Munipactures, and Mines. The limits of this work preclude our enlarging upon this department of the subject of chimneys. We may, however, quote one portion of Dr. Ure's account of his researches:—"In building chimneys, we should be careful to make their area rather too large than too small, because we can readily reduce it to any desired size by means of a sliding register-plate near its bottom, or a damper plate applied to its top, adjustible by wires or chains passing over pulleys. Wide chimby wires or chains passing over pulleys. Wide chimneys are not so liable as narrow ones to have their draught affected by strong winds. In a factory many furnace-flues are often conducted into one vertical chimney-stack, with great economy in the list erection, and increased power of draught in the several fires." Mr. Hirst, of the Office of Works, Whitehall, has invented and patented a new method of constructing chimney flues and tunnels, which has been tried, and found to succeed in many public buildings. The plan consists in building within the usual walls, and plan consists in building within the dustal wails, and incorporated with the common brickwork, circular smoke-flues or tunnels, which are surrounded in every direction, from top to bottom, by cavities, or bot-air chambers, commencing at the back of each fire-place, and connected with each other. The air confined within these chambers is said to be rendered sufficiently warm by the heat of any one fire, to prevent condensation in all the flues contained in the same condensation in all the flues contained in the same stack of chimneys. The figure of each brick composing these circular flues is wedge-like, their inclined figure enabling the builder to construct chimneys which may be curved and carried in any direction without producing any internal angles, the bricks being readily adapted to any required curvature. To construct a straight flue the thick ends of one course of bricks are placed alternately upon the thin ends of the next course; and, in order to make curves, the thick ends are placed together on one side. From the construction of these chimneys, and the nature of the materials of which they consist, no danger need the materials of which they consist, no danger need be apprehended should the soot ignite, for large accumulations of soot cannot take place, there being no internal ledges for it to rest upon. At the Saint Rollox chemical works, near Glasgow, there was a chimney—in Scotland called a "stalk"— not less than 450 feet from foundations to summit. The diameter 450 feet from foundations to summit, at the top 13 feet upon the ground-line was 40 feet, at the top 13 feet 6 inches. At Musprat's soda-seh factory, near Liver-6 inches. At Muspratt's soda-san factory, near Liverpool, there was a chimney 406 feet high; the dismeterat the ground-line was 46 feet, and at the top 9 feet. At the Rdinburgh gasworks there is a chimney 341 feet 6 inches in height. In 1859 a most ingenious device for straightening a chimney-stalk was conceived by Mr. Duncan Macfarlane, architect. The colossal chimney at Port Dundas had swayed to a considerable degree out of the perpendicular. In order to render this straighten at straight and safe. Mr. Macfarlane ordered agreeoutor the perpendicular. In order to render this structure straight and safe, Mr. Macfarlane ordered several of the mortar beds between the courses, on the side frem which the chimney leaned, to be sawed; there-

by allowing it to some back by its own weight, without the application of any external force. Only one direct cut at a time, to guard against any shock, which might have endangered the stability of the building; and by keeping the saws wet, a bed of mortar was prepare for the superincumbent weight to settle dow In this manner twelve cuts were made upon different parts of the structure, which generally set before the saws had passed through half of the circumference; saws and passed through that of the circumference, particularly in those made nearest the ground, where the weight was greatest. The method was attended with complete success. The principal dimensions of this chimney are—height, 468 feet; outside diameter, at foundation 50 feet, at surface 34 feet, at cope 14 feet. In 1861, MM, De Sanges and Masson addressed to the Feeth Andreas of Sanges and Masson addressed. to the French Academy of Sciences a paper regarding a novel mode of arranging chimneys. uniting all the flues in one place, so that the smoke passes into a single chamber, or receiver, near the roof of the house, and from which the smoke escapes by an opening at the top of the chamber in its centre. The system has been tried, with satisfactory results. Eight flues opening into a single chamber, and used Eight flues opening into a single chamber, and used singly, or two, three, or more at a time, and with wood, coal, and coke, have been used for eighteen months, and the draught has been very regular under all circumstances. These tall chimneys are built to convey away the noxious fumes from chemical and manufacturing establishments, and so relieve the neighbourhood of the nuisance they would otherwise convict. occasion. These immense structures are built up from a solid base, with side flues leading into the central cavity. The size of this cavity should, as in the chimneys of dwelling-houses, be of rather larger area than the sum of that of the flues which lead into it. In large stacks it varies from 3 feet in diameter, or 3 feet square, to 6 feet, contracting gradually towards the top. They are constructed with a brick for 3 feet square, to 6 feet, contracting granuary flowards the top. They are constructed with a brick lining, so laid as to leave an air-space between it and the outer wall, the effect of this being to check the rapid dispersion of the warmth of the vapoure. According to the Civil Engineers' Journal, vol. will. p. 319, the dimensions of tall chimneys should be sa

	Diam. at top,	Nominal
	inside.	Horse-power
yds. high.	ft in.	of Boiler.
20	1 6	10
25	1 8	12
30	1 10	16
33	2 0	20
35	2 6	30
40	3 0 to 4 ft.	50 to 90
45	4 6	120
50	5 0	160
55	5 6	200
60	6 0	259

nne annexed drawings exhibit the elevation and transverse vertical section of a factory chimney. Fig. 1. is the elevation, and fig. 2 the section. The scale for both figures is given at the foot of fig. 1.—Ref. Nicholson's Architectural Dictionary, The Civil Engineers and Architects Journal, The English Cyclopadia, Dictionary of Arts and Sciences, and The Self-aid Cyclopadia, by Robert Scott Burn.

CHIMPARED this man and Communication. The annexed drawings exhibit the elevation and trans-

pentag by Robert Good Burn.
CHIMPANZER, thim-pan-zee (Troglodytes niger), so species of ape, and one which in form and structure exhibits the greatest resemblance to man. It is a native of the warmest parts of Africa, and seldom attains a beight exceeding four feet when in an erect receiving. Its skin is thickly account with large black. position. Its skin is thickly covered with long black hair in front; and on the head, back, and limbs the hair grows thicker than elsewhere. The ears are thin, prominent, and naked, and not unlike human ears in shape. The appearance of the nasal organ is that of a mere pucker in the skin. The thumb of the hand is smape. The appearance of the based open the hand is amer pucker in the skin. The thumb of the hand is small and weak; that of the foot remarkably large and powerful. One of the most important of the distinctive points of difference between the anatomy of man and the anthropomorphous apes, is that in the former the muscle which terminates in a single tendon and concentrates its action on the great toe, in the case of the apes the same muscle terminates in three tendons, none of which is connected with the great

## China-ware

toe or hinder thumb, but which flex the three middle toes,—part of the adaptation of a foot for clasping as a hand. The great toe of the chimpansee is shorter than the other toes, and opposed to them as a thumb. The most man-like of this genus, however, is undoubtedly the gorilla, about which, till within the last quarter of a century, searcely anything beyond the most vague and preposterous stories were known. The chimpansee differs from the ourang-outang in having a cranium broader in proportion to its face, in eight more minute distinctions as to the characteristics of the skull; in the smaller size of the interistics of the skull; in the smaller size of the inceristics of the akult; in the smaller size of the incisor and canine teeth, and inferior development of the jaws, giving it a more human and less beast-like head; and in many other points relative to the conformation of the chest, loins, fingers, &c., amounting Professor. altogether to twenty points of difference. Professor Owen considers that, from the structure of the jaws and dental system of the ourang-outang, which are scarcely inferior to those of the lion, and greatly resemble those of the fiercer and more terrible carnivors, the chimpanzee ought to take place above the ourang-outang, and not below it, as it does in the Asimal Kingdom of Curier. It has often been stated that these animals are apt at imitating human habits, that these animals are apt at imitating human mouts, and of acting with gentleness and docility. Such statements must be received with caution. Whilst still young, they often exhibit great docility; but as they grow old, they become sullen, savage, and ferocious, and, like the rest of the anthropomorphous apes, are irreclaimably vicious. (See GORILLA,

OTHAMS-OTTIMES, AFE.)
CHINA-WARK. (See PORCELAIN POTTERY.)
CHINCHILLA, tshin-tshil-td, a small rodent animal, chiefly valuable for its fur, which is beautifully soft, down, and of considerable length, but so loosely attached to the abin. That it falls off unless handled with tached to the skin, that it falls off unless handled with considerable care. It associates in numbers, and excavates burrows, in which it resides, feeding chiefly on roots. In size and general form it resembles the rabbit, excepting the tail, which curls over, after the fashion of the squirrel's. It is a native of South America, and inhabits the valleys of the high mountain-districts. The length of the body is about nine inches, and that of the tail five. As soon as they die, their bair falls off; and for this reason it is unavailable for many purposes to which otherwise it would be

applied. CHINESE ARCHITECTURE, tshi'-neze .- The architecture of the Chinese is peculiar to China, differing entirely in form and ornamentation from that of any other Eastern nation. The materials that are used in building consist chiefly of marble, stone, wood, brick, bamboo, and tiles of porcelain, which are glazed and coloured. The erection of all buildings in China, whether for public or private purposes, is carried on under the supervision of a surveyor; and the rank of the person who is to inhabit it has much to do with the form and size of the private dwelling-house. These consist principally of a ground-floor and first floor; but houses of many floors have been sometimes built, reaching 200 feet in height. A great quantity of wood is used in building, which is richly coloured and relieved with gilding, so that the houses present a gay and picturesque appearance. The walls of the apments on the ground-floor are of tolerable solidity, generally pierced with square or long and narrow windows, which are often filled with elaborate trellis-On these walls wooden columns are erected to support the roof, which is formed of bamboo, and for the most part turned up at the edges. sometimes made in two parts, resembling one roof raing out of another. The windows and doors are often circular in form. The walls are plastered and decorated with panels containing paintings and inscriptions in the Chinese symbolic characters. Balconies are generally formed in front of the apartments on the first floor, the front of which consists of trellis-work. The royal palaces are of great extent, consisting of a series of courts, with galleries and halls of sudience, beautifully painted. The last court in the series is set spart as the residence of the em-

# Chinese Language

which was plundered by the French and burnt by the British in 1880, was surrounded by pleasure-grounds filled with heautiful buildings devoted to various purposes. Their tombs and mansoleums are generally formed in the side of a hill, the entrance being in the centre of a wall of polished granite, built in the form of a horseshoe, and flanked with side-walls surmounted by a heavy coping: a platform of granite is generally placed before the entrance. Arches of wood or stone are often erected across streets or at the entrance to a town or dwelling-house, with an inscription to the memory of some person deceased. Their temples differ greatly in form and size, but in many points of architectural construction and decoration they re-semble the dwelling-houses of a higher class. The ordinary temples, or joss-houses, consist of a chamber containing an idol. The Buddhist temples are larger and more elaborate, consisting of a vestibule, which leads to courts containing temples, sometimes two stories in height, in which are seated colossal images of Buddha. Buildings for various purposes are at-tached, such as the reception of animals offered by worshippers of Buddha, and the ashes of the priests who are burnt after death. The courts are surrounded by colonnades, behind which are rooms or cells, in which the officiating priests of the temple reside. The pagodas, which form a conspicuous feature in Chinese scenery, are either monumental records, or are in-tended for the reception of some relie of Buddha, are either monumental records, or are inlike the Japanese temple Boro Buddor. They are like the Japanese temple noro nugaror. They are generally octagonal in form and nine stories in height, surmounted by a conical roof, from which an ornamented pole rises. Each story is less in size than the one below it, and is surrounded by a balcony, from which a sort of pent-house projects, ornamented with bells at the corners. These pagodas are built of brick, and the exterior of some of them is coated with porcelain tiles. The walls of their cities are high, and broad at the top, with square towers at intervals. Their castles are also square in form, being contracted in size towards the top, and surmounted, like the walls, with battlements. The Chinese build bridges with circular, pointed, and elliptic arches, and assert that the method of constructing the various forms of arches has been known to them from very early ages, which is doubtful. Mr. Robert Scott Burn, in his useful work on architectural design, observes: "Every detail of Chinese archidesign, observes: "Every detail of Chinese archi-tecture is under strict supervision, and there is no deviation from established rules, which dictate the size of a house according to the rank or status of the occupant. Chinese columns have no capitals; the shaft is shaped like the frustum of a cone, the height varying from eight to twelve times the diameter at its lowest part. The base is formed of a square plinth, with, in some instances, a moulding above it. A pole, which some instances, a monitong above it. A pois, when is passed through an aperture at the upper end of the shaft, corresponds to the architrave in classical architecture; this is supported by two brackets, the lower part of which is inserted in the shaft. These are sometimes ornamented. A series of panels placed cometimes ornamented. A series of panels placed above this corresponds to the frieze, ornaments being painted in the spaces between the panels. The whole is surmounted by the concave tent-like roof, the angles of which being turned up, are ornamented at their extremities by representations of the heads of dragons."—Ref. Encyclo, Metropolitana and Huc's Travels in Tartury, Thibet, and China.
CHINESE GRASS. (See BCHMERIA).
CHINESE LANGIAGEA AND LIEVEN ADDRY—The Chinasa

CHINESE GRASS. (See BCHMERIA.) CHINESE LANGUAGE AND LITERATURE.—The Chinese language belongs to that class of tongues of Eastern Asia that are commonly termed monosyllabic, i.e. in which each word is pronounced by a single movement of the organs of speech, and each expresses a com-plete idea or object. The words all terminate either in a vowel or diphthong, or a nasal sound. Of such words or roots there are about 450 in the language. Many of these words, however, are differently pronounced or accentuated,—some of them in four or five different ways, and having as many different meanings. In this halls of sudience, beautifully painted. The last court in the series is set spart as the residence of the embout 1,200. There are, besides, many words that, with the same pronunciation, express very different things, about 1,060 yards in length by 840 yards in breadth. The words undergo no changes of form, and the want the words undergo no changes of form, and the want has Yuen-ming-yuen, or Summer Palace, near Pekin,

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or by the position of the words in a sentence. construction of the sentence is thus an important part of Chinese grammar, as upon it the meaning mainly depends. There are numerous dialects of the Chinese; but it is said to be spoken most purely and correctly at Nankin. The best grammars and dictionaries of the Chinese language are those of Morrison and Medhurst. In Chinese the alphabet is not composed of letters, but each word has a certain character peculiar to itself; and hence the number of characters corresponds with the number of words in the language. As the same words differently pronounced express different objects, the number of written characters must necessarily correspond; and hence it is said that the number of characters in the language exceeds 40,000. In its origin the Chinese language is hieroglyphic or pictorial, and to the original characters a number of symbolical and conventional signs have been added; by the union of which ventional signs have been added; by the union of which hieroglyphs and symbols, with an imperfect indication of the sound, the greater number of the Chinese characters are composed. Native grammarians divide their characters into six classes; the first comprising simple representations of sensible objects; as the sun, moon, mountain, tree, &c., and including 608 characters. The second class includes such as are formed that the interest the second class includes such as are formed. by the union of two or more simple hieroglyphs, which give a more or less clear idea of the meaning intended to be conveyed; as the sun and moon combined give the idea of light; mouth and bird, that of song. Of this class there are 740 characters. The third class is this class there are 740 characters. The third class is composed of such as indicate a certain relation of place; as above, below, the numerals, &c.,—of which there are 107. The fourth class comprises such chathere are 107. racters as, by being inverted, convey a contrary meaning; as right, left, standing, lying,—and contains 372.

The characters of the lifth class are termed borrowed characters, as expressing abstract ideas or mental acts by means of representations of sensible objects; as a eart signifying the spirit, a room a woman : of these there are 598. The sixth class comprises those that are composed of a hieroglyph and a mark representing the sound. Almost all the names of animals, trees, plants, and many other objects which it would be too difficult to represent hieroglyphically, are indicated in this way: their number is given at 21,810. These, however, are merely repetitions of those of the other five classes; so that the entire number of Chinese characters may be reduced to 2,425; and if one has characters may be reached to know all. Of the great number of characters that are to be found in Chinese dictionaries, amounting to about 40,000, not more than a tenth part are in common use. In the arrangement of their dictionaries, the Chinese select a certain number of characters, usually about 214, which serve as a sort of key, and answer the same purpose as the letters of our alphabet. The Chinese Literature is undunited with a side and in a comment. rature is undoubtedly the richest, and, in a geographical, historical, and ethnographical point of view, it is the most important of the whole of Asia. The printed catalogue of the library of the emperor Kein-long consists of 122 volumes; and a selection of the Chinese sissa of 122 volumes; and a selection of the United Classics, with commentaries and scholia, begun by command of the same mouarch, is said to comprise 130,000 volumes had appeared. In the five canonical or classical books called the "King" are contained the oldest specimens of the "Aing" are contained the onest specimens of Chinese poetry, history, philosophy, and jurisprudence, some portions of which are probably among the oldest written monuments of the human race. They were collected from various sources by Confucins in the 6th century before Christ; and in this collection they have century before Christ; and in this collection they have been handed down to us with apparent fidelity. The five "Kings" are—1. The "Y-king," or Book of Changes (a Latin translation of which was published by Mohl,—Stuttgart, 1832); 2. the "Schu-king," or Book of Annals, which is imperfect, comprising fragments of the early history of the people (Chinese and English, by Medburst,—Shanghai, 1846); 3. "Schi-king," the Book of Songs (in German, by Rückert,—Altona, 1833); 4. "Tschiur-thsien," the History of certain Kingdoms, from 770 B.C. to the time of Confucius; 5. "Li-ki," or Book of Germanies, which coutains a series of laws Book of Ceremonies, which contains a series of laws and directions extending down even to the minutest details of life. The "Tscheu-li," which has been translated into French by Biot (Paris, 1851), is a kind

of official handbook of the old Chinese empire. M the "Kings" in value and importance are the "S schu," or the four books which were written by Con sond, or the lout books and are to be regarded as the most certain sources for information regarding that important school of philosophy which has no marked a manner affected the whole intellectual and political a manner affected the whole intellectual and political condition of the Chinese. These four books are generally known as the works of Confucius, and have been translated into various languages:—into English by Collie (Malacca, 1828). To these books numerous schola, commentaries, and paraphrases have been within. scholia, commentaries, and paraparates and written. Almost contemporary with Confundas was Lac-tse, also the founder of a wide-spread school of philosophy. In mythology they have "The Book of Lactures, also the founder of a wide-spread sensol of philosophy. In mythology they have "The Book of the Mountains and Seas" and the "History of the Gods and Spirits." In jurisprudence, worthy of special notice is the general collection of laws and the original code of the present ruling dynasty—(See "Ta-Tsing-leu-lee, being the fundamental laws and supple-mentary statutes of the penal code of China," by Staunton; London, 1810.) The Chinese literature is also very rich in medical works, and works on natural history, astronomy, uranography, geometry, agri-culture, war, music, and all branches of technology and mechanics.—(See "Résumé des principaux Traites Chinois sur la Culture des Muriers et l'Education des Vers a Soie," by Julien; Paris, 1837.) In philology, the first rank is due to their dictionaries, which have the lirst rank is due to their dictionaries, which nave been prepared with great diligence, and examples col-lected out of the whole treasury of Chinese literature. The greatest work of this kind is the dictionary of the emperor Kang-hi, which is now regarded as the highest authority for the form, pronunciation, and significa-tion of the characters. Equally rich and valuable is tion of the characters. Equally rich and valuable the encyclopædic literature of the Chinese; amou which is the work of Matuan-lin (A.D. 1800), entitled "Wen-hien-thong-khao,"—i.e. an accurate examination of the ancient documents, with rich supplements,—presenting an ingrigatible with rich supplements, presenting an inexhaustible mine of the best materis for a thorough knowledge of the Chinese and the tor a thorough knowledge of the Uniness and was neighbouring races, from the oldest to the most recent times, in every department of life. But the most valuable department of Chinese literature is undoubt-edly the historical and geographical, which are abso-lutely indispensable to a thorough knowledge of Upper Asia. See ma-thsian (B.C. 100) compiled his "Seeki," or Historical Memorials, from every available source, and gives the history of China from B.C. 2837 to the commencement of the dynasty of Han, in the second century before the Christian ers. This work has been continued by the different dynasties, and forms a complete collection of the annals of the empire down to the end of the last dynasty of Ming, A.D. 1643. The entire collection of the official annals from 2698 B.C. to A.D. collection of the official annals from 2008 B.C. to A.D. 1645, a period of 4,343 years, and comprising 3,705 books, is to be found perfect in the library of Munich. Amongst their other labours, the Chinese have by no means neglected poetry, of which there are voluminous collections that have yet to be made known to Europe. As lyric poets, the names of Tu-su and Li-thai-pe, who flowing the labour the 3th actions are according to the contract of the second secon As tyric poets, the names of Tn-su and Li-that-pe, who flourished about the 8th century, are specially ramous. Of their numerous poems little is as yet known.—(See Davis "On the Poetry of the Chinese," in the "Transactions of the Royal Asiatic Society," vol. ii.) The romances of the Chinese are not characterized by any great flights of the imagination, but are valuable as giving an insight into the domestic life, and the modes giving an insignt into the domestic me, and the indees of thinking, feeling, and acting of the people. Their dramatic poetry follows peculiar rules, and approaches partly the romantic plays of the Germans, partly the commedic delle arti of the Italians. They have also a kind of dialogue novels, which form a subordinate spe-cies of drama. The best-known collection of dramas is "Yuen-dschin-pe-tschong,"—i.e. the Hundred Dramas from the Mongolian dynasty (1260—1341), out of which all the dramas that are yet known to us have been all the drames that are yet known to us have been taken; as the "Lac-seng-urh," or an Heir in his Old.
Age, by Davis (London, 1817); "Hang-koung-tsew," or the Sorrows of Han, by Davis (London, 1829). The richest collections of Chinese books in Europe are at Paris, London, Berlin, Munich, and St. Petersburg. We possess as yet no history of Chinese literature. The Chinese themselves have numerous works of this class. but they are very mearre, and are almost each class; but they are very meagre, and are almost en

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## Chinese Tallow

tirely confined to bibliographical and critical aketches. Ref. Brockhaus's Co. ratione Lexikon.

CRIMEN TALLOW. (See STILLINGIA.)
CHINGEY, hi-rur-je (Gr. cheir, a band, and ergon, a work), is a term sometimes used in place of surgery, from surgical operations being performed by the hand.

CHIVALRY, tohiv'-dl-re (Fr. chevalerie, from chevalier a haight or horseman), is a term applied to the order of largethood established during the Middle Ages in almost all the kingdoms of Europe, and whose laws, rules, and customs are still to be found largely perrules, and customs are still to be found largely per-vading the manners and oustoms throughout Europe. Though chivalry first assumed importance in the 11th century, it was far from being, as many have supposed, as invention of that period, but sprang naturally and by degrees out of the feudal system that had long prevailed over a great part of Europe. Its origin is to be taxed to the feudal mansions of the barons, where young men were trained to the occupation of the between the vassal and his lord. By degrees the in-fluence of the Church manifested itself, and religious ceremonies were mingled with those by which a young ceremonies were mingled with those by which a young man was adustited to the rank of a warrior. To the influence of the clergy are to be attributed in great measure those high moral principles that characterized the spirit of chivairy, and were so far in advance of the them condition of lay society in general. The coucation of a knight was briefly as follows:—The young and noble stripling, generally about his 12th year, was sent to the court of some baron or knight, where he seemt his time in acquiring the use of arms and atspent his time in acquiring the use of arms and attending upon the ladies. The respect for female character, which was one of the marked features of chivalry, was one of the characteristics of the ancient German tribes, and is mentioned by Tacitus. When advancing age and experience in the use of arms had qualified the page for war, he became an escuyer, or esquire, so called from escu, or scudo, a shield, because it was part of his duty to carry the shield of the knight whom he served. The third and highest rank of chivalry was that of knighthood, which was not conferred before the 21st year, except in the case of dis-tinguished birth or great achievements. The individual prepared himself by confessing, fasting, &c.; religious rites were performed, and then, after promising to be faithful, to protect ladies and orphans, never to lie or utter slander, to live in harmony with his equals, he received the accolede, a slight blow on the neck with the flat of a sword, from the person who dubbed him a the nat of a sword, from the person who dubbed him a hnight, and who, at the same time, pronounced a for-mals to this effect:—"I dub thee knight, in the name of God and St. Michael (or in the name of the Father, Son, and Holy Ghost). Be faithful, bold, and for-turaste." A warlike spirit, an undefinable thirst for glosy, and a lofty devotion to the fair sex, were the great characteristics of chivalry. The crusades gave a more religious turn to the spirit of chivalry, and made the knickts of all Christian nations known to each other. the knights of all Christian nations known to each other. Chively was at its height between the 11th and the 14th centuries. It decayed with the decline of fends institutions, in the 15th century, and in the 16th it had almost ceased to exist.

almost ceased to exist.

CHIORANTHACEE, klo-rün-thai'-sc-e (Gr. chloros, green; anthos, a flower), in Bot., a small nat. ord. of diestyledonous tropical plants, in the sub-class Monocklemydee, consisting of about fifteen species, which are arranged into three geners. They are herbs or under-shrubs, with jointed stems, sheathing leaves, and spiked achiamydeous flowers, with scaly bracts. The typical genus Chloranthus includes some useful apecies. The roots of C. officinalis and brackystochys have been employed in Java ses timulants in malicinant Lave been employed in Java as stimulants in malignant fovers, and for their antispasmodic effects. The leaves of C, inconspicuus are used in China to perfume tea. Aromatic stimulant properties are common to all the plants of this order.

CRICAGE ACID, klor'-ik (ClO<sub>a</sub>).—This acid has never been obtained in an isolated condition, it being, as yet, impossible to separate from it the last equivalent of water. It is formed by passing a current of chlorine through an alkaline solution, when the chloride of the most and the chlorate of the alkali are formed. It is or simed as a monohydrated acid by mixing an equiva-

### Chlorimetry

lent proportion of sulphuric seld with a solution of chlorate of baryta, and submitting the decented liquid to spontaneous evaporation in vacuo. It is colourism, strongly soid, has an oily consistence and a pungent smell. Paper dropped into it inflames. It is not decomposed by light, and its exidizing properties are very powerful. It forms salts with bases, called observers, which are decomposed by heat, the chloride of the metal being left behind, while oxygen is liberated. The most useful of them is the chlorate of potash, which is formed by passing chlorine through a solution of caustic potash: chloride of potash and chloride of potassium are formed, the former being separated by crystallization. (For an account of its valuable pro-

crystallization. (For an account of its valuable properties, see Potash, Chlorate of.)
Chloride of Lime. (See Calcium, Chloride of.)
Chlorides, klor-ides.—Chlorine enters into combination with the metals and the non-metallic elements, forming compounds of great importance. These will be treated of particularly under the heads of their respective bases. They all, however, possess some common properties which it will be well to consider in this place. With the exception of the chloride of silver and the sub-chlorides of mercury and conse silver and the sub-chlorides of mercury and copper, all the chlorides are soluble in water. In many of their properties they closely resemble the oxides; and it is generally found that a metal will enter into as many combinations with chlorine as it does with oxygen. Thus we have the proto- and bi-chloride of platinum, corresponding to the proto- and bin-oxide of that metal. They are all fusible at ordinary temperatures, and melt and dissolve with greater readiness than their corresponding oxides. Chlorides of metals are mostly formed by dissolving the oxide or carbonate of the metal in hydrochloric seid. This process fails in the case of magnesium and aluminium. of the metallic chlorides are decomposed when heated in a current of hydrogen, hydrochloric acid and the pure metal being the result. This is taken advantage of in the formation of pure iron and several other metals. The chlorides of the noble metals are gene-rally decomposed by simple ignition, the metals rerally decomposed by simple ignition, the other maining behind in an uncombined form. The other maining behind in an uncombined form. When heated with black oxide of manganese and sulphuric acid, they eliminate chlorine.

CHLORIMETRY, klor-im'-e-tre (chloriae, and Gr. metron, a measure), the name given to the method of determining the amount of available chlorine in the chloride of lime of commerce. There are several ways of effecting this. The oliest is ascertaining the weight of the amount necessary to decompose a certain amount of a standard solution of indigo or sulphuric amount of a standard sometion or hands and acid. This process has been abandoned, being rendered fallacious from the solution of indigo becoming more analysis discoloured by keeping. The method spontaneously discoloured by keeping. The method at present employed consists in determining the at present employed consists in determining the amount of bleach necessary to convert a known quan-tity of arsenious acid, AsO<sub>3</sub>, into arsenic acid, AsO<sub>3</sub>. Another method, which is perhaps more frequently used than the one just mentioned, is to ascertain the quantity of bleaching-powder which is required to peroxidize a known amount of protosulphate of iron. A certain amount of protosulphate of iron is dissolved in water,-say 50 grains of the latter to 1,000 grains of in water,—say or grains of the latter to all the former, forming the test-liquid. Fifty grains of bleaching-powder are dissolved in a little water and poured into a test-measure. The bleaching-powder poured into a test-measure. The bleaching-powder solution is then dropped into the protosulphate until a drop of ferricyanide of potassium (red prussiate of potash) no longer gives a blue precipitate. The operation is concluded by a simple rule-of-three sum. Chlorimetry is an hourly operation with calico-bleachers, it being important to know the exact strength of the steeping-liquor at each immersion of fabric, Mr. Crum's process is the one generally employed. It is founded on the property possessed by acetic acid of turning a solution of a persalt of iron to a deep red. Known quantities of acetic acid, perchloride of iron, and bleach-liquors are mixed together, and the colour produced is compared with those of twelve vials ranged in a frame, containing similar ingredients, submitted to known but varying proportions of chlorine. In this instance the colour indicates the exact amount of chlorine contained in the measured

#### Chlorine

quantity of bleach liquor; from which data the per-

centage is easily calculated.

Chloring, klor'-ine (Gr. chloros, green),—symbol Cl, equivalent 35-5, spec, grav. 2-44.—Chlorine, dephlogisticated marine acid, or arymuriatic acid, was discovered by Scheele in 1774, while examining an ore of manganese. It was thought at first to be a compound gas; but Gay-Lussac and Themard supposed, and Sir Humphry Davy proved, that it was an elementary body. It was the latter philosopher that bestowed upon it the name of chlorine, from chloros, green (Greek), on account of its colour. It occurs in nature in great abundance, in combination with many mineral but Gay-Lussac and Thenard supposed, and Sir substances, such as rock-salt; also in sea water and sea plants, as the chlorides of potassium and sodium. sea plants, as the chordres of potassian and souther.
It may be prepared in two ways,—either by heating black oxide of manganese with hydrochloric acid, or by heating a mixture of black oxide of manganese, chloride of sodium, and dilute sulphuric acid. It is a caloride of sodium, and difficult to the stransparent gas of a greenish-yellow colour and a powerfully suffocating odour, which, even largely diluted with air, produces great irritation of the airpassages. One hundred cubic inches weigh between 77 and 78 grains. It is, therefore, about two and a half times heavier than atmospheric air. Water absorbs about twice its volume; it can, therefore, be only collected by displacement or over warm water. Under a pressure of four atmospheres it condenses into a yellow limpid liquid, rather heavier than water, and remains fluid and unfrozen at a temperature of -220° Fahr. With water, chloring forms a definite hydrate, which, when subjected to a cold of 32° Fahr., solidifies in the form of large yellow crystals. Chlorine is not combustible, but supports combustion to a cer-tain degree. A wax taper burns in it with a reddish smoky flame, the hydrogen of the wax combining with the chlorine to form hydrochloric acid, and the carbon being set free. Chlorine, in common with several other elementary bodies, has the property of replacing hy-drogen in its organic compounds. It is in this manner that chlorine bleaches textile fabrics. The brownness of the fabric is due to some brown organic substance, which, when submitted to the action of chlorine, parts with its hydrogen and assumes a colourless form, containing chlorine. This fact is proved on a large scale by the action of chlorine on indigo. Another property of chlorine is that of destroying noxious vapours and miasmata. For the same reason, it is used as a disinfectant, the action being the same as that mentioned above. For laboratory use, chlorine is best made as follows :- Oil of vitriol and water, of each seven parts. follows:—Oil of viriol and water, of each seven parts, Allow the mixture to cool, and add four parts of chloride of sodium, mixed alternately with three parts of peroxide of manganese. The gas comes off slowly at irrst until the application of a gentle heat, when it immediately rushes forth in large quantities. The manufacture of chlorine for bleaching purposes is described under Bleaching-Powden. Chlorine is possessed of powerful affinities, and unites with all the metalloids and metals. With oxygen it forms five compounds. powerful alimities, and unites with an ene inclamate and metals. With oxygen it forms five compounds,—hypochlorous acid, ClO; chlorous acid, ClO;; peroxide of chlorine, or hypochloric acid, ClO;; chloric acid, ClO; perchloric acid, ClO;; all of which are described under their respective heads. With hydrogen it forms hydrochloric acid, and with nitrogen a fearfully explained perchloride of nitrogen. With expressions are considered to the constant of the const plosive substance,—perchloride of nitrogen. With carbon it forms several chiorides. (See Carbon.) In many of its properties, it bears a very strong analogy to its congeners bromine and iodine. The relation subsisting between the atomic weights of these three bodies is very peculiar, the equivalent of bromine being halfway between iodine and chlorine:—

2)162.5

80 being the equivalent of bromine. The same relation is carried out in the properties of these bodies, bromine standing halfway between the other two in bromino standing hailwayweetween the other two in be collected by displacement, as it acts both on messpecific gravity, colour, affinity, solubility, and consistency. Chloride of iodine, too, possesses many proporties in common with bromine. Whether bromine wildow, wood), in Bot., a gen. of tropical trees belonging

### Chloroxylon

will ever be discovered to be a chloride of foding a not, is a question to be answered by the chemistry of

CHLORINE-WATER.—Water at 60° absorbs two vol-umes of chlorine. When freshly made, this solution possesses all the properties of the gas. It gradually becomes decomposed, liberating oxygen and forming

hydrochloric acid.

hydrochloric acid.

Chichororam, klor-o-form (prefix chloro, and formyl!,—C,HCl,.—This interesting compound is preduced by a variety of reactions. The most usual way
of preparing it is by acting upon dilute alcohol with
chloride of lime. Six parts of chloride of lime are
mixed with twenty-four parts of water, and one part
of alcohol is added to the mixture; the whole is transferred to a capacious still, and the heat is quickly
raised until it reaches 180°. The products, which consist of chloroform and water, collect in two layers, the
lower of which is chloroform. It is senarated from lower of which is chloroform. It is separated from the water by means of a pipette, agitated with sulphuric acid, and once more distilled. Chloroform is a colour-less, volatile, mobile, highly refracting liquid, of specific gravity 1497, and boiling at 1429 Fahr. It has an ethercal odour, and a sweetish penetrating taste, it is readily soluble in ether and alcohol, but sparingly so in water. Concentrated sulphuric acid has but little parties out it and active the contraction out the order teacher the sulphuric acid has but little action on it, and potassium does not decompose it. It yields, however, to the action of light, and should be tested for alcohol and other products of decomposition before it is used for an exthetic purpose. Pure chip-roform, when dropped into water, should fall to the bottom without becoming milky. Alcohol is detected in it by its turning green on the addition of bichromate of potash and sulphuric acid. It should remain colourless when oil of vitriol is agitated with it, and the liquid itself should be perfectly colourless, and free from any chlorous odour. The vapour of chloroform has the remarkable property of rendering a person action on it, and potassium does not decompose it. from any chlorous odour. The vapour of chloroform has the remarkable property of rendering a person breathing it temporarily insensible to pain. To Professor Simpson, of Edinburgh, is due the credit of introducing chloroform as an anesthetic. (See Ann-STRETICS.) Chloroform is an excellent solvent for sal-STRETICS.) Chorotorin is an excellent solvent to such that phosphorus, and iodine. It also readily dissolves latty and resinous bodies. It is a perfect solvent of caoutchouc, which is left unaltered on evaporation. Chemists are at variance as to the real composition of chloroform, some regarding it as a derivative of methyl, others looking on it as a terchloride of formyl. There are other chlorides derived from the same source, having the formulæ C<sub>2</sub>HCl<sub>2</sub> and C<sub>3</sub>HCl<sub>3</sub> bet source, naving the formulae C<sub>2</sub>MCl<sub>2</sub> and C<sub>2</sub>MCl<sub>2</sub> and they have not yet been proporty studied. Iodine and bromine form similar substances,—iodoform and bromoform, having the formulae C<sub>2</sub>Ml<sub>2</sub> and C<sub>2</sub>MBr<sub>3</sub>. Chlorosts, kloro-isis (Gr. chloros, green), in Med., is the name of a disease to which young females are

subject, and which is characterized by a peculiar sallow or greenish-yellow huo of the countenance, and hence known as the green sickness. It is usually attended with great debility, palpitations of the heart, difficulty of breathing, pains in the back and loins, and other distressing symptoms. The principal means to be employed in the cure of this disease are gentle exercise in the open air, with nutritious and rather stimulating diet, tonics, sea-bathing, and agreeable

society.

Chlorosponæ. (See Algæ.) Chlorous Acid, klor'-ous (ChO<sub>a</sub>), one of the oxides of chlorine. It is a dark greenish-yellow gas, possess ing a purgent odour and bleaching properties. If heated to 135° Fahr, it explodes, being resolved into chlorine and oxygen; it also explodes when placed in contact with combustible substances. By intense cold and pressure it may be reduced to the form of a red liquid. Water dissolves about six times its volume of liquid. Water dissolves about six times its volume of the gas, the solution varying in colour from green to yellow, according to the degree of saturation. Chlorous acid has powerful bleaching properties, and combines with bases to form chlorites, many of which are crystallizable. It is expelled from its combinations by carbonic acid. It is prepared by heating nitric acid, chlorate of potash, and arsenious acid. The gas must be collected by displacement, as it acts both on measure and water.

to the nat. ord. Cedrelaces, or Mahogany fam. to the nat. ord. Convences, or managiny iam. All the species have dotted leaves, which yield by distillation an essential oil. C. Swistenia furnishes Indian satin-wood, which is sometimes imported into this country for the use of cabinetmakers. Boyle states that this tree is one of the plants that yield the wood-old finding. (See December 1982)

cui of India. (See DIPTERCOLARDS.)
CHOCOLATE. (See THEOBROMA.)
CHOIN, quire (Gr. chores, Lat. chorus, Fr. chour,
Bax. and Ger. chor), is that part of a church or cathedral where the singers or choristers chant or sing divine service. It is also applied to those whose special duty it is to perform the service to music. Every chair is divided into two parts, stationed on each side of the choir, in order to sing alternately the verses of the palms and hymms, one side answering to the other. The choral service in the English churches had been much neglected, but a great improvement in this respect has taken place within the last forty or fifty Years.

CROKE-DAMP, tshoke'-dümp (Ang.-Sax.), a name given by miners to carbonic acid, as distinguished from the-damp, which is carburetted hydrogen.

CHOLERA, kol'-e-ra (Gr. chole, bile, and rheo, I flow) in Med., is the name given to two or three different forms of disease, each of which is characterized by vomiting and purging, with great pain and debility. The mildest form of this disease is known as bilious or British cholera, and usually prevails to a greater or less extent in this country every summer or autumn. It apparently proceeds from some disordered condition of the bile, which is either in excess or too acrid, and ie bile, which is either in excess or too scrid, and seems to be produced by cold, suppressed perspira-tion, unripe or acid fruits, &c. It generally commences with griping pains of the bowels, followed by vomiting and purging, together with heat, thirst, a hurried respiration, and a frequent but weak and fluttering pulse. In favourable cases these symptoms subside in a few days, leaving the patient in a very weak and exbausted condition; but in severe cases great depression bassted condition; but in severe cases great depression of strength ensues, attended with great anxiety and lowness of spirits, violent spasms, cold clammy sweats, a hurried and short respiration, hiccup, a low and irregular pulse, and the patient sinks rapidly, being sometimes carried off in twenty-four hours. In the earlier and milder form of this disease, when the strength is not much exhausted, tepid demulcent liquids are to be frequently administered, so as to lessen the irritation and facilitate the discharge of the Where the symptoms are severe and the patient rapidly sinking, opium is to be administered freely, rapidly sinking, opium is to be administered freely, but in small quantities, and effervescent saline draughts given to check the sickness, and enable the atomach to bear the frequent doses of opium. When the urgent symptoms are relieved, the strength is to be restored by gentle tonics and a light and nutritious diet. The neverer form of this disease is sometimes called spasmodic cholers, from being usually attended with violent and the first property of the strength of the epasms. The Asiatic, malignant, or pestilential choiers, is a much more violent form of disease, and first became known in this country in the autumn of 1831. commonly comes on without any warning, and the patient is frequently a corpse in a few hours. The attack usually begins with sickness and purging; the discharge in this case not being bilious, but a thin colonriess fluid like rice-water, accompanied with great prostration of strength and cold clanmy sweats. In a short time dreadful cramps assail the extremities, and afterwards the abdomen and other parts of the body; the body becomes bent, the limbs twisted, the secuntenance cadaverous, the pulse almost impercepti-ble, the eyes sunken and surrounded by a dark circle, the patient sinks into a state of spathy, and, unless a favourable change speedily takes place, he soon ex-pires. When reaction takes place, the pulse gradually returns, the natural warmth of the body is restored, and the spasms and difficulty of breathing give way. and ane spasms and dimenty of breating give way. Brequently, however, the reaction is accompanied by fever, closely resembling typhus, and which often terminates fatally, in from four to eight days. As regards the treatment of this disease, the only advice that can be given here is, to seek the aid of a medical way without delay.

carrageon, or Irish moss, which is used medicinally for its nutritive, emollient, and demulcent properties, being administered in the form of a decoction or jelly. It is also used for making bandoline (which see), and as a substitute for size. C. mamillosses, which has similar properties, is always found in the carrageen moss of the shops.

CHORAL SERVICE, kord-al, of the English church is when those parts of the service ordered in the rubrice are sung by a full complement of clergymen and che-

risters in a cathedral church.

CHORD, kord (Lat. chorda), in Geom., is a right line drawn from one part of an arc of a circle to another. The term is also applied to the string of a musical instrument.

CHORD, in Mus., the harmonious combination of three or more musical sounds. Before the introduction of simultaneous sounds, it was solely applicable to a distended sonorous string; but after the discovery of counterpoint, and the formation and establishment of various combinations, a general term became necessary to express those combinations, and that which before applied only to a single string was now borrowed, and its sense extended to a union of the sounds of several strings, pipes, or voices. In practical music there are several kinds of chords; i.e. the fundamental chord, consisting of the third, fifth, and eighth of the fundamental bass, or their inversions;—the accidental chord, which may result from either of two causes, viz., anticipation or retardation; by anticipation when their construction assumes some note or notes of a succeeding chord (a chord not yet struck); by retardation when one or more notes are, by suspension, carried in to the composition of the succeeding chord;—the anomalous or equivocal chord, in which some interval or intervals are greater or lesser than those of the fundamental chord ;- and the transient chord, in which some intermediate notes are introduced to smoothen the transition from one chord to another, which do not form any component parts of the fundamental, and cannot be justly called either anticipations or suspensions.

HOREA, kor-e'-a (Gr. choreia, a dancing or jumping), in Med., is the name of a disease otherwise known as St. Vitus's Dance, and characterized by convulsive motions of the limbs, as of a person dancing. The muscles of voluntary motion are no longer under the complete control of the will, and the power of walking or of using the arms or hands is impaired. It is comor of using the arms or hands is influence. It is common to both sexes; but rarely attacks before the age of eight or after that of sixteen years. Those of a weakly constitution, or whose health has been impaired by confinement or improper nourishment, are chiefly subject to it. The great cause of it is a disordered state of the digestive organs, producing a certain degree of mental weakness. The patient is at first restgree of mental weakness. The patient is at first rest-less, irritable, fretful, and gloomy. After a time there come on irregular and involuntary twitchings of the nuscles; he cannot walk steadily, or drags one leg after him; the arms become affected, and the muscles of the face, head, and trunk may become at different times and in different degrees, affected by it. This disease usually disappears under judicious treatment, or as the patient grows up; but occasionally it terminates in epilepsy, paralysis, or idiotcy. The proper mode of treatment is to restore the tone of the system by tonics, a nourishing diet, and frequent exercise in the open air, with occasional purgatives, if necessary.

Chorus, kor'-us (Lat.), among the ancients, denoted a number of singers and dancers employed on festive occasions, and also in the performance of plays. During the most flourishing period of Attic tragedy, the chorus consisted of a group of male and female personages, who remained on the stage as bystanders or spectators, and, during the intervals of the acting, chanted songs relating to the subject of the play. They sometimes even took part in the performance, by advice, comfort, consolation, or dissussion. In early times it consisted of terminates fatally, in from four to eight days. As a great number of persons, sometimes as many as fifty, but it was afterwards limited to fifteen. The leader that can be given here is, to seek the aid of a medical man without delay.

Chondry, kon'-drue, in Bot., t' gen. of Alga. The most important species is C. crispus, commonly called chorus was divided into two parts, which sang afternately. With the decline of ancient tragedy, the most important species is C. crispus, commonly called

#### Chorus

attempts have been made to restore the ancient chorus;

attempts have been made to restore the sucient chorus; as in Schiller's "Bride of Messins."

Chorus, in Mus., alindes, in its general sense, either to a composition of two, three, four, or more parts, cach of which is intended to be sung by a plurality of voices; or to the performers who sing those parts, and form what is called a chorus, or choral part of a band.

Chors, shows (Fr.), signifies a thing; and a chose in action is a thing of which a man has not the possession or extract any owners but he a right to demand the

or actual enjoyment, but has a right to demand the same by action; for property in things personal is of two kinds, —either in possession, where a man has not only the right to enjoy, but also the actual enjoyment of the thing; or else it is in action, where a man has only a bare right, without any occupation or enjoyment, the possession whereof, however, may be recovered by a suit in equity or action at law; from whence the thing so recoverable is called a thing or chose in action; and although a debt or right of action may be assigned, the assignee can only recover in the name of the assignor, except in cases of bankruptcy, where the law has given the power to the assignee to deal with the debt or right in his own name as assignee, it

being vested in him by operation of law.

Chouans, shoo an', was the name given to a party of royalist insurgents that appeared on the right bank of the Loire during the first French revolution. At first they were composed chicily of smugglers and other lawless persons; but they were speedily joined by peasants, priests, noblemen, and others. They are said to have taken their name from one Jean Cottereau or Chouau, a leader of one of their bands, and who fell in an engagement on the 2nd of February, 1794. As early as 1792, the marquis de la Roarie attempted to bring them to open insurrection; but, in consequence of his arrest, the attempt fell to the ground. In the following year Jean Cottereau succeeded in this attempt, and, for a time, the Chouannerie, as it was called threat-ened to imperil the security of France, and the guerilla warfare which followed gave employment to as many as 60,000 regular troops. At length, partly by force and partly by negotiation, the movement was put down; and though Chousanerie has, on more than one occasion since, attempted to make its appearance on the banks of the Loire (as in 1799 and in 1814-15), it has never again become formidable.

Chough, takuf (Sax. eeogh), (Fregilus graculus), a British bird, much resembling in size and habits the jackdaw; its colour, however, is in parts different. It is of a jet black over its upper parts, while the head and neck feathers are tinted with purple. The beak is bright vermilion, bent from the base, and very strong. The legs and feet are of the same colour as the beak, and powerfully formed. Its length, when full grown, is about fifteen inches. Like the jackdaw, the chough is easily tamed, and just as mischierous and entertaining when its domestication has been

accomplished.

CHRESTOMATHY, kres-tom'-d-the (Gr. chrestos, useful; manthano, I learn), is a name sometimes applied in literature to a collection of useful pieces out of the best authors. The analogous term anthology is usually limited to selections from the poets.

CHRIST, CHREROF. (See TRULLERS.) CHRIST-CHURCH COLLEGE, ONFORD, krist tshurtsh, owes its first foundation to Cardinal Wolsey, who, in 1525, obtained from Clement VII. a bull for the suppression of twenty-two monasteries, the aggregate revenues of which were estimated at nearly £2,000, in order to found and endow a college at Oxford, on the site of the priory of St. Frideswide. It was to have consisted of a dean, sub-dean, 100 canons, 10 public readers, 13 chaplains, an organist, 12 clerks, and 13 choristors, and was to have been culled the "Collego of Secular Priests;" but afterwards, the name was changed to "Cardinal's College." Before its comchanged to "Cardinal's College." Before its com-pletion, the cardinal had fallen into disgrace; and in 1532 the society was refounded by the king, under the title of "Henry VIII.'s College." In 1545 this was again suppressed; and in the year following it was re-established under the name of the "Cathedral Church of Christ in Oxford," for the maintenance of a dean, of Christ in Oxford," for the maintenance of a dean, it stands, nevertheless, in necessary connection with 8 canons, 8 chaplains, a schoolmaster, an organist, the essence of these powers and with their mede of 8 clerks, and 8 choristers, together with 100 students. development. Otherwise, indeed, it would not be By ordinance of the commissioners, under 17 & 18 fitted to raise them to higher perfection, and, in short,

## Christianity

Vict. c. 81, the number of canons is reduced to 6, a students to 80; of which 28 are senior students (with permanent tenure) and 52 junior students, of whom 21 are to be elected from Westminster school, and hold their places for seven years; the remaining 21 student-ships being open to all candidates who have not are ceeded their eighth term from matriculation, and are tenable for five years. Every third junior studentship is to be given for proficiency in mathematics and for proficiency in physical sciences alternately.—Ref. Oxford University Calendar, 1871.

CHRIST-CHOSS Row, kriste-kros-ro', was the name given to the letters of the alphabet arranged in the form of a cross, and used in the instruction of children. It is referred to in Shakepeare: "And from

the cross-row plucks the letter g.

CHRISTIAN KNOWLEDGE, SOCIETY FOR THE Pro-MOTION OF, an incorporated society for the education and religious instruction of the poor, supported by the members of the Church of England, and the oldest society of the kind in the kingdom. It was founded society of the kind in the kingdom. It was founded by the Rev. Dr. Thomas Bray in 1698, and was in-corporated in 1701, its objects being, "(1) to promote and encourage the erecting of charity schools in all parts of England and Wales; (2) to disperse, both at home and abroad, bibles and tracts of religion; and, in general, to advance the honour of God and the good of mankind by promoting Christian knowledge, both at home and in other parts of the world, by the heat at home and in other parts of the world, by the best methods that should offer." These objects the society ever has, and still continues to keep in view. Numeever has, and still continues to keep in view. Numerous charity-schools have been established by it in all parts of the country large sums have been expended in behalf of missionary enterprises abroad; and bible and tract distribution are largely carried on. The accept annually expends about £100,000 in furtherance of these objects.

CHESTERIA NAME (See NAME)

CHRISTIAN NAME. (See NAMES.) CHRISTIANITY krist-c-dn'-e-te (from Christ, Gr. Christos, the Anointed One), is that religion which was instituted by Jesus Christ, and whose doctrines are con-tained in the books of the Old and New Testaments. When the filness of the time was come,—when the three great historical nations had each in its own peculiar way co-operated in preparing the soil on which Christianity was to be planted,—the Jews on the side of the religious element; the Greeks on the side of science and art; the Romans, as masters of the world, on the side of the political element;—then it was that through Him, and by the power of the Spirit that proceeded from Him—by the might of Christianity—all the threads of human development which had hitherto been kept apart were to be brought together and interwoven in one web.
Whilst, on the one hand, the seed of divine truth out whilst, on the one hand, the seed of divine that does of which Christianity sprang was communicated to reason by divine revelation; so, on the other hand, reason, unfolding itself from beneath, had to learn by reason, unfolding itself from beneath, had to learn by experience, especially among the Greeks, how far, singly, and by its own power, it could advance in the knowledge of divine things. The preparations, made by the previous development of the history of nations had been leading precisely to this point, and were destined to proceed just so far in order to admit of Christianity, the goal and centre-point of all. "We look upon Christianity," says Neander, "not as a power which has sprung up out of the hidden depths of man's nature, but as one which descended from above, when heaven opened itself anew to man's long alignated race: a power which, as both in its long alienated race; a power which, as both in its origin and its essence it is exalted above all that human nature can create of its own resources, was designed to impart to that nature a new life, and to change it in its immost principles. The prime source of this power its inmost principles. The prime source of this power is He whose life exhibits to us the manifestation of it is it o whose He exhibits to us the manuestation of hedesia of Nazareth, the Redoemer of mankind, when estranged from God by sin. In the devotion of faith in Him, and the appropriation of the truth which He revealed, consists the essence of Christianity."

"Rut, although Christianity cannot be understood except as something which, being above nature and reason, is communicated to them from a higher source,

would be unable to exercise any influence upon them." This connection consists therein that whatever has by their Creator been implanted in the essence of heman nature and reason, whatever has its ground in their idea and their destination, can only attain to its full realization by means of that higher principle, such as we see it actually realized in Him who is its source, and in whom is expressed the original type and model after which humanity has to strive. And accordingly we discover abundant evidence of this connection when we observe human nature and reason, and see how by wirtue of this, their original capacity, they do, in their historical development, actually strive after this higher principle, which needs to be communicated to them in are the control of th to assimilate it to its own nature, and to imbue it with its own spirit, that on a superficial view Christianity itself appears to be only a result produced by the joint action of the several spiritual elements it had drawn together. And for the same reason it may also be blended for a while with the impure elements which it attracts by its influence, and so in its temporary manifestation assume a shape which wholly resembles them; but at last by its own intrinsic power it begins a process of purification, from which it issues refined and emobled even in its outward form. In the history of Christianity we have the growth of that mighty tree which, springing up from the little grain of mustardseed, is destined to overshadow the earth, and under the branches of which all nations are to find a safe lodging. We "survey a process of development in which we ourselves are still involved,—a process which, noving steadily onwards, not always in a straight line, but through various windings, is yet in the end furthered by whatever attempts to arrest its progress, a process which, having its issue in eternity, constantly follows the same laws; so that in the past, as it unfolds itself to our view, we may see the gorm of the future which is yet to meet us." The history of Christianity materally divides itself into two branches,—the external and internal, a cording as the events of which it is made up have happened to the Church from without, or have been transacted within its own body. To the ernal branch belongs, first of all, the history of that sigious faith which forms its bond of union both in scientific development and life in the members; ext, the character of the public religious exercises; and thirdly, the form of government. To the external stations of the Church belong, first, its diffusion, and, second, its relation to other associations, particularly the state. In the treatment of the history of Chrismaity, the old system of division into centuries has been rightly abandoned, and a division into epochs lopted instead, though considerable difference of ion exists as to determining the different epochs. Bender divides the period from the introduction of Christianity to the Reformation into six epochs, empirising, (1) the first three centuries, or down to a.s. 312; (2) from the end of the Diocletian persecution to the time of Gregory the Great, bishep of the Christian of Gregory that time of Gregory Reme (312—590); (3) from the time of Gregory the Great, bishep of Reme (312—590); (3) from the time of Gregory the Great to the death of the emperor Chailemagne (390—814); (4) from the death of Charlemagne to Peope Gregory VIII. (314—1973); (5) from Gregory VIII. (314—1973); (5) from Gregory VIII. (1073—1294); (6) from Bosiface VIII. to the beginning of the Reformation: The history of each epoch is divided into four meritions:—(1) the relation of the Christian Church to the world, its extension and limitation; (2) the Church constitution, Church discipline and schisms; (3) Christian life and Christian worship; (4) Christianity appresented and developed as a system of doctrines. Dr. Gionelar divides ecclesiantical history into four periods:—(3) from the introduction of Christianity to the time (1) from the introduction of Christianity to the time Constantine (i.e. till 324), when the acknowledgment of the Church in the Roman empire was secured,—the first development of the Church under external oppression; (2) from the time of Constantine to the pression; (2) from the time of Constantine to the pression; (2) from the time of Constantine to the pression; (2) from the time of Constantine to the pression; (2) from the time of Constantine to the pression of the controversies concerning image-worship (324-728),—the development of Christianity as the pression of the state; (3) from the beginning of the controversies to the single of the fields by night in the middle of the limit seed on the controversies to the account for the choice of the 25th of De-

—the development of the Papacy prevailing over the state; and (4) since the time of the Reformation, the development of Protestantism. The evidences in favour of the truth of Christianity are divided into external and internal. The external evidences are those that tend to prove the authenticity and divine authority of the Holy Scriptures, and have been divided into direct and collateral. The direct evidences are such as exise from the nature, consistency, and probability of the facts, and from the simplicity, uniformity, competency, and fidelity of the testimonies by which they are supported. The collateral evidences are either the same occurrences, supported by heathen testimonies, or others which concur with and corroborate the history of Christianity. Its internal evidences arise either from its exact conformity with the character of God, from its aptitude to the frame and circumstances of man, or from those supernatural convictions and assistances which are impressed on the mind by the im-Pope Pius IV. and the Catechism of the Council of Trent; (2) the Eastern, or Orthodox Greek Church, the creed of which is defined in the symbol entitled the creed of which is defined in the symbol entitled "The Orthodox Confession of the Catholic and Apostolic Greek Church' (1642); (3) the unti-Byzantine Eastern churches of Armenia, Syria, Egypt, and Chalden; (4) the Protestant Lutheran clurches holding the Confession of Augsburg (1539); (5) the Protestant churches holding the Galic, Helvetic, and Belgie Confessions; (6) the Protestant Episcopal churches holding the Thirty-nine Articles of the Anglican church; and (7) the Protestant churches adhering to the Westminster and Savoy Confessions."—
[Conder.] The total number of professing Christians (Conder.) The total number of professing Christiana is estimated at about 300,000,000, of which, probably, nearly one-half are Roman Catholies, about 65,000,000 belonging to the various sects of Protestants, and probably a like number to the Greek church. The principal points in the history and doctrines of Christianity will be found noticed under their proper heads in different parts of this work.

Christians, krist wins, are those who profess Christianity, or the religion of Jesus Christ. (See Christnanty.) The disciples, we are told, were called Christians first at Antioch.

CHRISTIANS OF ST. THOMAS is a name applied to a people residing on the Malabar coast, in the south of India, and who profess the Christian religion. The Portuguese navigators, by whom they were first visited, represent them as professing to have received Christianity from the apostle Thomas, who is by some believed to have carried the Gospel into India. Others regard them as the descendants of a colony of Nestorians; but the most probable conjecture is that they are an offshoot of the ancient Christian churches in Persia. They have the episcopal form of government. and are said to acknowledge the patriarch of Antioch; and are said to acknowledge the patriarco of Andoon; their churches contain no symbols or pictures, except the cross; their priests are allowed to marry, and they celebrate the Agapm.

CHRISTIANS. OF THE CHRISTIAN CONNECTION, a sect of Christians which arose in America in the beginning of the present century. They profess to re-

ject all creeds and all sectarian distinctions, and to receive the Scriptures as the only rule of faith and practice, each member being at liberty to determine for himself as to what is enjoined. They practise baptism by immersion and open communion, and the great majority of their members are professed Unitarians. Their members are estimated at about 300,000, and their ministers at 600.

Christman, krist mile (Christ, and Ang. Sax. mas, a holiday or feast), a Caristian festival observed in memory of the nativity of Christ, on the 25th of December. The exact day of the nativity of Christ has long formed matter of dispute; but it is generally agreed that it could not have been on the

cember,—the winter solstice, by showing, that not only the feast of the Nativity, but most of the others, were originally fixed at cardinal points of the year, and that the first Christian calendars having been so arranged the first Christian calendars having been so arranged by mathomaticians at pleasure, were afterwards adopted by the Christians as they found them in the calendar, the main object being to have a fixed time of com-memoration appointed. Be this as it may, the 25th of December has been the day fixed upon for the com-memoration of the nativity from the carliest ages of the Church. The festivities that used formerly to characterize this period have now, in a great measure, passed away. According to Polydore Virgil, the English were remarkable for the festivities with which they distinguished Christmas; and these are given at considerable length in Brand's "Popular Antiquities." On the night of Christmas-eve, it was usual to light up candles of uncommon size, called Christmas candles, and to lay a log of wood upon the fire, called a Yule clog or Christmas block, to illuminate the fire, and as a second state of the control of the cont it were, to turn night into day. At court and in dis-tinguished families, an officer, under various titles, was appointed to preside over the revels. Stowe says, "that in the feast of Christmas there was in the king's house, wherever he lodged, a Lord of Misrale or Master of merry Disports; and the like had ye in the house of every nobleman of honour or good worship, were he spiritual or temporal." The mayor of London and he spiritual or temporal." The mayor of London and cach of the sheriffs had their several Lords of Misrule. The Puritans in England were very much opposed to these ceremonies; and in Scotland, the Abbot of Unreason, as he was there called, was suppressed by act of parliament in 1555. Yule seems to have been originally a pagan festival, observed in ancient times among the Romans, Saxons, and Goths, in commemoration of the temperature of the suppression of the second services. ration of the turning of the sun and lengthening of the day, and was afterwards kept up by the Christians. In a tract, entitled the "Vindication of the Solemnity of the Nativity of Christ," by Thomas Warmstry (1638), it is said, "If it doth appeare that the time of this festival doth comply with the time of the heathens' saturnalia, this leaves no charge of impiety upon it; for since things are best cured by their contraries, it was both wisdome and piety in the ancient Christians (whose work it was to convert the heathens from such as well as other superstitions and miscarriages) to vindicate such times from the service of the Devill by appoynting them to the more solemne and especial service of God." The custom of decking churches and houses at Christmas with laurel, box, holly, or ivy, appears also to have been copied by the Christians from their pagan ancestors.

CHRISTMAS-BOX, is a small sum of money given to servants and others on the day after Christmas, which is hence called Boxing-day. The practice was, undoubtedly, founded on the pagan custom of new-year's gitts; and, until recently, it had spread to such an extent as to have become almost a national griev-Tradesmen sent their journeymen and apprentices to levy contributions on their customers, and they, on the other hand, bestowed boxes on the servants of their customers. To the tradesman it was a pretence for lengthening out his bill; to the master and mistress for lowering the wages of their servants. In 1836 the secretary of state for foreign affairs issued a circular to the different embassies, requesting a dis-continuance of the customary Christmas-boxes to the messengers of the foreign department and others; and since that time the practice has very much decreased.

CHRISTMAS CAROLS. (See CAROLS.)
CHRISTOLOGY, kris-tol'-o-je (Gr. Christos, Christ, and logos, discourse), is the doctrine of the person of Corner, a term applied to such treatises as those of Owen, Neander, Hengstenberg, and Dorner, which profess to expound what is taught in Scripture respect-ing the person of Christ.

CHUISTOPHOEI, kris-tof-o-ri (Gr., Christ-bearers), a name sometimes given to Christians in the early Church to denote the communion that exists between Christ and the Church.

Christ and the Church.

CHRIST'S COLLEGE, CAMDRIDGE, was founded in 1505, by Lady Margaret, councess of Richmond and Derby, nother of Henry VII., for a master, twelve chromine used in commerce. The mineral, which efellows, and forty-seven scholars. Edward VI. added sixts of protoxide diron and sequinoide of chromine and sequinoide of chromate is reduced to powder, fused in a reverberatory fuses one fellowship and three scholarships, and several

others were added by subsequent benefactors recent arrangements, the scholarships have bee solidated and greatly improved in value; and sent the college consists of a master, fifteen fol and twenty-nine scholars. The fellowships and sola ships are now open to all the queen's subjects, with

restriction or appropriation.

CHRIST'S HOSPITAL, LONDON, was established up the site of the Grey Friars' monastery, in terms of charter granted by Edward VI., 26th June, 1553, as hospital for poor fatherless children and orpham is commonly called the Bine-coat School. dress worn by the boys, which consists of chine of or gown, a yellow petticost and stockings, a r black bonnet or cap, a red leather girdle round the waist, and a clergyman's band round the neck. 1672 the mathematical school was founded by Chaster II. for forty boys, who are distinguished by a badge on the right shoulder, and called "King's boys." Subsequently another foundation was added by a Mr. Stone, the boys on which wear a badge on the left shoulder, and, from their number, are called "the Twelves;" and afterwards "the Twos" were added on another foundation. The governing body is composed of the mayor, aldermen, and twelve common counsilmen of the city of London, and contributors of semantic for the city of London, and contributors of semantic cach to the hospital funds amountine in all to uswards. 1672 the mathematical school was founded by Ch each to the hospital funds, amounting in all to up of 500. Boys are admitted between the ages of se "King's boys" or Grecians, i.e. to the highest ele-formerly six, but now eight Grecians, are seast, various scholarships, to Oxford and Cambridge. I right of presentation is vested in the governors. lord mayor has two presentations aunually; each the aldermen one; and the other governors one in eve The foundation-stone of the New Hall three years. three years. The foundation such that the tree was laid in 1825, and it was publicly opened in 1825; the architect being the late Mr. James Shaw. A branch school was established at Hertford in 1883 for the education of younger children, boys as well girls; the former being maintained and educated until they are capable of being received into the London hospital. The average number constantly maintained and educated in both establishments is about 1,209 (800 in London and 400 in Hertford), and the amount revenue and expenditure are each generally as £56,000. The New Hall of the hospital fronting No. gate Street is one of the chief ornaments of the City Among the eminent men who have been educate here are Camden the historian, Bishop Stillingfleet Richardson the novelist, S. T. Coleridge, Charles Lumb, and Leigh Hunt.

CHROMATES, kro'-maits (from chromium).—Chromacid combines with bases to form three classes of salts,

basic, neutral, and acid. Most of the chromates are highly coloured. The most important are described under Chromate Are.

CHROMATICS, kro-mät'-iks (Gr. chroma, colour; terminal-ikos), a term applied to that part of the science of Optics which explains the properties appertaining to the colours of light. White light consists of different coloured rays and had with different colours of the science and the different coloured ways and had with different colours of the science of the s ferent-coloured rays, each enducd with different degrees of refrangibility; and the different colours of bodies depend upon the power they have of ab-sorbing or reflecting certain coloured rays. A sur-face that appears blue reflects that colour more than the others, which are absorbed; a white surface reflects all and absorbs none; while a black surface absorbs all and reflects none. By analyzing a ray of adsorbs an and reflects hole. By analyzing a lay-solar light with a prism, Sir Isaac Newton first de-nonstrated the unequal refrangibility of the various coloured portions. He also concluded, from his experiments, that white light consists of seven colours red, orange, yellow, green, blue, indigo, and violetz these he called the primary colours. According to Sir David Brewster, there are only three primary colours,—blue, yellow, and red. A theory has recently been propounded, that colours are the results of the mixture of white light with shade. (See LIGHT, Orange Spream) TICS, SPECTRUM.

CHROME IRON-ORE, OF CHROMITE, krome, an importa ore of chromine, from which are obtained the salts of chromine used in commerce. The mineral, which con-sists of protoxide diron and sesquioxide of chromine. with balf its weight of nitre, and stirred continually. In this manner the chromium is converted into chromate of potash. The mass is dissolved out with hot water, and the silica and alumina are precipitated by

water, and the since and aluming are precipitated by some strong soid, which at the same time converts the neutral chromate into the acid bichromate.

CHROME OCHER, a mineral consisting chiefly of oxide of chromium, found in fine yellowish-green masses, which are generally so mixed up with the rock in which it is found, that it is impossible to separate the strong strong

rate them except by chemical means.

CAROME, ORANGE.—Dichromate of lead, which is of a splendid orange-colour, is obtained by adding to a solution of nitrate of lead a solution of chromate of potash, to which an equivalent of hydrate of potash has been added. It is obtained of a still more brilliant colour by fusing together five parts of nitre and one part of chromate of lead. Chromate of potash and dishromate of lead are formed, and the former salt is

removed by washing.
ORROWS YELLOW, a valuable pigment, made by precipitating a salt of lead with bichromate of potash.
It is much used on account of its brilliant yellow

Chromic Acid, kro'-mik (CrO<sub>3</sub>).—This acid occurs in nature in combination with lead as chrome yellow, and with iron as chrome iron-ore. It is prepared by adding one measure of a warm saturated solution of bichromate of potash to one and a half of concentrated sulphuric acid. The acid is added in small portions at a time, the solution being allowed to cool between each addition. Chromic acid crystallizes out, and bisulphate of potash remains in solution. The crystals of chromic acid must be removed with a platinum lanie, and set to drain in a funnel stopped with as-They must not be heated or brought into contact with organic substances. As soon as the greater part of the sulphuric acid has drained away, the crystals are dissolved again and recrystallized under needles, which are very deliquescent, and soluble in water. Although chromic acid is one of the most powerful oxidizing agents known, it is easily decom-posed by light and organic substances. When absolute sicohol is poured on crystals of chromic acid, the former is oxidized with sufficient energy to cause combustion, the chromic acid being reduced to sesquioxide of chromium. Sugar and other organic substances have the same power of decomposing chromic acid. Chromic acid bears great analogy to sulphuric acid Both these acids are isomorphous; they are monobasic, and they form an acid and a neutral salt.

The most useful of these compounds of chromic acid is the bichromate of potash, which forms fine red tubular crystals, which are anhydrous, and remain unchanged by exposure to the sir. Bichromate of potash dissolves in ten parts of cold water, the solution having a fine red colour and an soid reaction. The chromate is easily formed from the bichromate by neutralizing its solution with carbonate of potash, and crystallizing. Both the chromate and the bichromate are extensively used in dyeing and calico-printing. Bickromate of potash is employed in conjunction with sulphuric soid in the laboratory as an oxidizing agent, and in commerce in the same manner in bleaching sperm oil. The bichromate of ammonia is used in photography. Except the chromate of lead, which is described under CHROME YELLOW, the other chro-mates and bichromates are unimportant.

CHROMIUM, kro'-mi-um (Gr. chroma, colour),-symbel Cr. equivalent 26.27, spec. grav. 5.9,—a pretty rare element, first shown to be a metal by Vauquelin, in 1797. Its most important ore is the chrome iron stone, a compound of protoxide of iron and sesquioxide of chromium. It is also found as chromate of lead, from which mineral Vauquelin first obtained it in the metallic state. To effect its reduction, oxide of chromium is intimately mixed with powdered charcoal, and made into a paste with oil. It is then introduced into a crucible lined with charcoal, and carefully luted The whole is exposed to the action of a power-

passing the vapour of sodium over the aesquiexide heated to redness. By heating seequichloride of chro-mium with potassium, a grey metallic powder is formed, which consists of chromium in an allotropic condition. Chromium is a light-grey metal, very brittle, non-volatile, and non-magnetic. As might be inferred from the difficulty with which it is reduced, chromium, in the metallic state, has not yet received any useful application. Its oxide and many of the chromates have received useful applications in calico-printing and china-painting. The manufacture of biohromate of potash is very important, not less than 1,500 tons of chrome iron-stone being annually imported from the United States and Norway, to be converted into this useful salt.

CHROMIUM, CHLORIDES OF.—There are two principal chlorides of chromium,—the protochloride, CrCl, and the esquichloride, Cr<sub>2</sub>Cl<sub>3</sub>. The former is formed by passing a dry current of hydrogen over the sesquichloride heated to redness; hydrochloric scid is given off, and the protochloride remains in the form of a white powder, soluble in water, with which it forms a bluish-green solution that rapidly absorbs oxygen from the air.—Seeguichloride of chromium is formed in beautiful transparent plates of the colour of peachblossoms by passing a current of dry chlorine over a mixture of sesquioxide of chromium mixed with charcoal contained in a porcelain tube heated to redness. Being volatile, the sesquichloride condenses at the cool end of the tube in the beautiful form just described. Thus prepared, it is quite insoluble in water and acids. Solution of sesquichloride of chromium is prepared from the hydrated sesquioxide by dissolving it in hydrochloric acid. The solution, on evaporation, yields green crystals, containing two equivalents of hydrochloric acid and ten equivalents of water. It is a singular fact, that only two-thirds of the chlorine contained in the solution of this salt is precipitated by nitrate of silver. A violet chloride may be formed by precipitation from the violet sulphate by chloride of barium, from the solution of which the whole of the chlorine can be precipitated by nitrate of silver.
CHROMIUM, OXIDES OF.—Chromium forms several

compounds with oxygen, of which the most important are four:—Protoxide, CrO; sesquioxide, Cr<sub>0</sub>O; chromic acid, CrO<sub>3</sub>; perehromic acid, CrO<sub>3</sub>; perehromic acid, Cr<sub>0</sub>O;—Protoxide of chromium can only be obtained in the state of bydrate on adding caustic potash to a solution of the proto-chloride. It absorbs oxygen with great avidity, de-composing water and setting free the hydrogen, becoming converted into a hydrated intermediate oxide. The protoxide of chromium forms a double sulphate with sulphate of cotash, closely corresponding to the double sulphate of iron and potash in form and composition. The crystals are of a fine purple colour.—
Sesquioxade of chronium is obtained as a greyishgreen hydrate, by boiling with alcohol a solution of bichronaste of potash aciduated with sulphuric soid.

The alcohol spice held the oxygen of the hydrate acid. The alcohol seizes half the oxygen of the chromic soid, leaving the sesquioxide free to form a sulphate with the sulphuric acid. On the addition of ammonia, a bulky gelatinous greyish-green precipitate of hydrated sesquioxide is produced, which, when dry, contains ten equivalents of water. In the hydrated condition it is readily soluble in acids, forming salts which do not crystallize. These saits, like the oxide, exist under several conditions, each condition giving rise to dissimilar properties. As this subject is rather complicated, the reader is referred to the article isomensms, where the subject is fully treated. The anhydrous green oxide is not decomposed by heat; hence it is of great use in china- and enamel-painting. It is generally prepared for this purpose by exposing chromate of mercury to a red heat. The difficulty with which this oxide is decomposed by ordinary chemical re-agents has rendered it useful as a pigment for printing bankers' cheques and other important documents; but a great objection to its use is the fact of its being so hard that the pens used for writing upon drafts printed by it are speedily worn out. Oxide of chromium is the colouring matter of the emerald, pyrope, greenstone, and other minerals.—Chromic acid has already been considered, under that head.—Perchromic acid is formed by adding fall wind-furnace for several hours, and an impure minerals.—Chromic acid has already been considered, mixture of carbon and chromium is formed in the crucible. M. Fremy has lately succeeded in procuring an aqueous solution of peroxide of hydrogen to chromium in the form of cubical metallic masses, by

#### Chronic

is rapidly decomposed with evolution of oxygen. If, bowever, the solution is agitated with ether, the per-chromic soid is isolated without decomposition, and may be made to form pretty stable salts with ammonia and certain organic bases. Strong saids decompose these salts, setting free the blue perchromic said. Chronic, kron'-ik (Gr. chronos, time), a term applied in medicine to such diseases as are of long durations.

tion, as contradistinguished from acute,-those that

soon terminate either in recovery or death.

CHROWIGLE, kron-i-kl (Gr.), denotes a history in which the events are narrated in the order of time. It is nearly synonymous with annals, the only distinction between the two being, that chronicles are generally more full and connected. The term is now seldom used except in speaking of our old English histories; as Holinshed's Chronicle, Stow's Chronicle. It is sometimes taken as the name of a newspaper; as the Morning Chronicle.

CHEONICLES, the name given to two books of the Old Testament standing thirteenth and fourteenth in our English version. In the Hebrew they are called Books of Days, i.e. diaries; and in the Septuagint things omitted, or supplements, from their being in some measure supplementary to the books of Kings which precede them. The first nine chapters of the first book contain a great variety of genealogical tables, beginning with Adam, which must have been very valuable to the Jews after their return from the captivity. The more ancient are so obscure as to be hardly intelligible unless collated with the Pentateuch. The more modern are the most perspicuous; but even they are not complete. Nothing is to be found of the tribes of Dan or Zebulon; that of Benjamin is twice in-troduced; Judah is pretty copious; and the register of David's descendants runs down to the end of the 4th century before Christ (by some believed to be a later addition). The genealogies of the priests and Levites are given most in detail, and terminate with the destruction of Jerusalem.

CHRONOGRAM, krof-no-gram (Gr. chronos, and gramma, a letter), is applied to a verse or sentence, certain letters of which are in larger characters than the rest, to denote the date of the event to which it relates.

CHRONOGRAPH, kro'-no-graf (Gr. chronos, time; grapho, I write), is an instrument devised by Mr. Benson, the watchmaker, for taking the time of races. It is used on all occasions where it is essential to obtain the rate of speed with perfect accuracy. It consists of an ordinary quick-train movement of a lever watch, on a scale sufficiently large to carry the hands for an S-inch dial, and with the addition of a long seconds hand, which traverses the dial, instead of being, as usual, just above the figure VI. The peculiarity of the chronograph consists in this seconds hand and the mechanism connected with it. The hand itself is double, or formed of two distinct hands, one lying over the other. The lower one at its extreme end is furnished with a small cup, or reservoir, with a minute orifice at the bottom. The corresponding extremity of the upper hand is bent over so as to rest externity of the upper name is bent over so as to rest exactly over this puncture; and the reservoir having been illed with ink, of a thickness between ordinary writing-fluid and printers ink, the chronograph is ready for action. The operator, who holds tightly grasped in his hand a stout string connected with the mechanism peculiar to this instrument, keeps a steady look-out for the fall of the starter's flag. Simultaneously, therefore, with the start of the race, the string he holds is pulled by him, and, at the same moment, the upper hand dips down through the reservoir in the lower, and leaves a little dot or speck of ink upon the dial. This is repeated as the horses pass the winning-post, so that a lasting and indisputable record is afforded by the dots on the dial of the time-

record is afforded by the dots on the dial of the time—
exact to the tenth of a second—which is occupied in
running the race.—Ref. Mechanics' Magazine, vol. xv.
CHRONOLOGY, kro-nol'o-je (Gr. chronos, time, and
bogos, discourse), the science which treats of the
various divisions of time, distinguishing its several
parts,—such as centuries or ages, years, months,
weeks, days, hours, &c., and of the order of the succession of events.

CHRONEMETER, kro-nom's-ter (Gr. chronos, time; metron, a measure), literally any instrument for mea-

#### Church

suring time; the term is, however, generally applied to those time-measurers which are used for determin-ing the longitude at sea. The mechanism is essentially ing the longitude at sea. The mechanism is consuming the same as that of an ordinary watch, but the size is greater. In the construction of such chromometers special precautions are taken to allow for change of tamperature and other causes of derangement. (See HOROLOGY.)

CHRYSALIS. (See INSECT TRANSPORMATIONS.)
CHRYSANTERMUM. (See CORYMBIFER.)
CHRYSOBALANER, kriso-bai-lai-nee (Gr. chrusos, gold; balanos, a nut), in Bot, a sub-ord. of the net. ord. Rosacex. The plants belonging to this division are trees or shrubs, principally natives of the tropical parts of America and Africa. Many of them produce edible drupaceous fruits. The typical gen. Chrysobleanus includes two valuable fruit-trees. C. Legeo yields nus includes two valuable truit-trees. C. Leave yields the cocoa-plum of the West Indies; and in Brazil the roots, bark, and leaves are prescribed against disrrhea and other similar maladies. C. luteus yields a fruit

which is eaten in Sierra Leone.

Chuysornyllum, krissofil-lum (Gr. chruses, gold; phullon, a leaf), in Bot., a gen of tropical trees belonging to the nat. ord. Sapotaceæ. The species C. Cainito vields a delicious fruit known as the star-apple. C.
Buranheim furnishes the astringent bark called Monesia bark, which has been much employed in France and Germany. This bark contains an acrid principle called

monesine, which is analogous to suponine.

CHRYSOTYPE, kris'-so-tipe (Gr. chrusos, gold; tupos, impression), a process in photography invented by Sir John Herschel, in which pictures are produced by means of aumonio-citrate of iron and chloride of gold. (See Photography.)

CHUB, tshub (Ang. -Sax.) (Leuciscus cephalus), of the same genus with the roach, dace, bleak, &c. It is plentiful in many of the rivers of England and of the south-west of Scotland. The chub rises freely at

variety of baits, - slugs, grasshoppers cockchafers, and humble bees among the number. The best place to fly-fish for chub is close under overhanging trees, by the sides of



streams, or against piles or other places that offer ready shelter. The chub spawns in May, and comes into condition again about the end of June or beginning of July. It bites freest, and is in the best condition for bottom-fishing, between the middle of October and November. The colours of the chub are blue-black

and November. The colours of the chub are blue-blank on the upper part, silvery white below; cheeks and gill-covers golden yellow. Weight seldom exceeding five pounds. Is not considered a great dainty.

Church, Isharish (Ger. kircke, Dan. kirke, Scotch kirk), in generally supposed to be derived from the Greek kuriakon, belonging to the Lord; from kurios, Lord. In its widest signification, the term Church is applied to the whole collective body of those who profess to be followers of Jesus Christ, and hence denominated by ancient writers the Catholic or Universal Church. The assembly of the faithful upon carth is sometimes called the church militant, as distinguished from the church triumphant, the faithful already in glory. In a more limited sense the term is already in glory. In a more limited sense the term is applied to a body of Christians differing in its constiapphed to a body of Christians differing in its constitution, doctrines, and usages from the rest; as the Roman Church, Greek Church, Reformed Church. In another sense it is applied to the whole Christian community of a country, or to the established refigion of a country; as the Gallie Church, Church of England, Church of Scotland. In a still more limited sense it is applied to a particular congregation of Christians, who associate together and participate in the institutions of Christ with their proper Dasture unristians, who associate together and participate in the institutions of Christ with their proper pastors and ministers. It also signifies the building in which Christians assemble for the worship of God.

Church, in Arch., the name given to a building especially set spart for the worship of God.

## Church, Greek

models after which churches are principally built are those of the old Roman basilies (see Basilies), and the cruciform plan adopted in Byzantine architecture (See BYZANTINE ABCRITECTURE,) Churches are di-(See BYZINTIM ARGHITECTURE) Churches are divided into five classes:—1. Metropolitan churches, or the principal churches in the sees of archbishops; 2. Cathedral churches (see CATHEDRAI); 3. Collegiste churches, or churches that have a chapter of canons, but no bishop; 4. Conventual churches, or churches attached to a monastery under the superintendence of an abbot; and 5. Parish churches. The first four classes are more ornate in character, and are considerably larger than the fifth, and have numerous chargeds and aisless attached, which are not to be found in the pagish church. The cathedral church, so called because it contains the throne of a bishop, which has because it contains the throne of a bishop, which has been described in a preceding article, may be taken as the general type of these four classes. The parish church, particularly those built prior to the date of the church, particularly those built prior to the date of the Enformation, is generally built in the form of the Latin eroes, with the nave much longer than the arms, forming the transpots and clory, or chancel. Those of the 18th century are, for the most part, built in imitation of the old Greek temple, a style utterly unsuited to a Christian church; but in the 19th century, a tendency is shown to imitate the purer Byzautine form of church exhibite transport in the chiracters and to build the churches more in the architecture, and to build the churches more in accordance with the form of the Greek cross, in which the nave, transcots, and chancel, are of equal length. The principal part of our old parish churches belong to the Anglo-Norman, Early Perpendicular, and Decorated forms of English architecture. At the west end stands a massive tower with a belfry, buttressed and finished with battlements and pinnacles; but sometimes the belfry is in a tower built on arches at the intersection of the arms of the cross, which is often sur-mounted by a spire. The body of the church consists of a nave, separated from the side aisles by rows of of a nave, separated from the side aisles by rows of pillars. The principal entrance is generally on the south side. The transepts are small, and in some churches there are none, or only one small transcept on the south side, and one aisle to the nave. The chancel is separated from the nave by a screen carved in wood. The communion-table stands at the east end of the chancel, inclosed by rails. The vestry is usually found on the north side of the chancel, and the reading-desk and pulpit before the screen in the nave, sometimes on the north side and together, and at other times, one on either side of the central passage running through the church. The font stands at the west end, opposite the mouth porch. There is a gallery at the west end of the majority of churches for the choir and organ, if there be one. The nave and aisles are usually divided into a number of pews, resembling loose boxes; but these are practically being removed, and long low pews, or open benches, are substituted for them wherever the in-terior of a church has been beautified and restored. The windows consist, for the most part, of lozengemed panes in easement-lights, set in stone mullions.

CHURCH, GREEK. (See GREEK CHURCH.) CHURCH OF ENGLAND. (See ANGLO-CATHOLIC

CHURCH OF ROME. (See ROMAN CATHOLICISM.)

CHURCH OF SCOTLAND. (See SCOTLAND, CHURCH OF.)
CHURCHING OF WOMEN, tshurtsh'-ing, is a public
and solemn acknowledgment enjoined by the Church to be made by a mother, after childbirth, of the blessing that has been vouchsafed to her. It doubtless owes its origin to the Jewish rite of purification enjoined by Moses, and complied with by the Blessed Virgin; but it is not regarded by the Church as a purification, but as a thankagiving to God for a mer-efful deliverance. The office is of great antiquity, and is found in the ritual both of the Western and

Eastern churches.

Office Charles. (See Taxes and Rates.)

OHURCHWAUDENS, tehurtsh-waur'. dens, formerly called sharch-reves, or ecclesia guardians, are the guardians or keepers of the church, and the legal representatives the body of the parish. They are chosen annually the parson and his parishioners, according to the om of the place, and their duties are to look after the church, church, represented &c.; to observe the behaviour of the parishioners with regard to such faults as come under the jurisdiction of the ecole-

### Cichorium

stastical court; to take care that none preach without a license, &c. They constitute a kind of corporation, and are enabled to sue and to be sued at law.

CHURCHYARD, takurtah'-yard, is the ground ad-joining to the church, in which the dead are buried. (See BURIAL.)

(See BURIAL.)
CHUCKYARD BERTLE. (See BLAFS.)
CHUTKEE, taket'-nee (its Indian name), a condiment
very largely consumed in India and Great Britain.
There are many varieties of chutnee, but it generally
consists of a compound of mangoes, capsicum or chillies, and lime-juice, flavoured with garlic and eschalots. Several native fruits, such as tamarinds, are often added to East-Indian chutnec.

CHYLE, kilo (Gr. chulos, juice), is the milk-like fluid which is formed by the action of the bile and pancreatic juice upon the chyme in the duodenum, and absorbed by the lacteal vessels. The use of the chyle is to apply the matter from which the blood is formed and the veste of the kiling areas a result of the chyle is to apply the matter from which the blood is formed and the

waste of the living organs repaired. (See Digestron.)
CHYME, kime (Gr. chumos, juice), is the ingested
mass formed by the action of the stomach upon the food, and which passes from the stomach into the duo-denum. (See DIGESTION.)

CIHORIUM, ei-bor'-i-nm, was a name originally given to the husks of an Egyptian bean, and came afterwards to be applied to the canopy with which the altar was The term is also applied to the pyx or box in which the host is preserved.

CIBCTIUM, si-bo'-te-um, in Bot., a gen. of ferns, nat. ord. Filices, including several species which produce silky hairs useful to man. The styptic called penawar, which is often used in Holland and Germany, consists of the fine hairs from the caudex of C. Burn-metz, the "Scythian lamb" of old writers. These hairs are imported from Sumatra, and are sometimes em-ployed for stuffing cushions. Similar hairs are brought from the Sandwich Islands, and are known under the name of pulu. Three different species are said to yield

CICADA, se-kai'-dā (Lat., grusshopper), a gen. of insects of the ord. Hemiptera, common in tropical and warm temperate regions, and remarkable for the loudeness of the sounds they emit. The organs that produce these shrill sounds consist of membranes and fibres these shrill sounds consist of membranes and norse connected with powerful muscles, and situated on the under-side of the abdomen. The largest insect of this genus does not exceed an inch in length; yet it is asserted that they may be heard in the still night at a distance of at least half a mile, and that the sound they contribulity similars briften a relative to emit is like grinding a knife on a whetstone.

CICATRIZATION, sik'-a-tri-zai'-shun (Lat. cicatrico, I heal up), is a term in Surg., applied to the healing or skinning over of an ulcer or broken surface of the skin.

CICER, si' ser (from Gr. kikvs, strength, in reference to its qualities), in Bot., a gen. of plants belonging to the nat. ord. Leguminione, cub-ord. Papilionacca. C. arictinum, a native of the countries around the Mediterranean, produces the edible seeds called chick-peas. These are extensively used as food, either boiled or roasted, and are the most common parched pulse of the East. The herbage affords a nutritious food for cattle.

CICERONE, tellsh-e-rof-ne, a name first given in Italy to those persons that act as guides to strangers in showing them the sights of Rome and other cities. The term is said to be derived from Cicero, and to have been given to them on account of their great garrulity. The word has now come into general use, and is applied to any one who points out the interesting objects of a town to strangers.

CICHORIUM, si-kor'-e-um (Lat.), in Bot., a gen. of plants belonging to the nat. ord. Composita. The species C. Litybus is the wild chicory or succory, a plant indigenous to this and many other countries of Europe, having numerous heads of bright-blue handsome flowers. It is extensively callivated for the sake of its roots, which are sliced, roasted, and ground, to form the chicory of the shops, which is sold as a substitute for, or more frequently as an addition to, ground coffee. Nearly 100,000,000 lbs. are annually consumed in Europe. Much of the chicory used in Britain is of home growth; but still more is imported in the raw state from Holland and other parts of the continent. Though so extensively used instead of coffee, chicory

### Cicindelide

does not possess in any degree the peculiar exciting, soothing, and hunger-staying properties of that valuable product. The fresh root has been employed in medicine to produce similar effects to those produced by the dandelion root, (See Taraxacum.) A blue dye may be prepared from the leaves. C. Endiva is the garden succory or endive, the leaves of which, when blanched, form a wholesome salad.

CICINDELIDE. (See TIGER-BHETLES.)
CICISBEO, tshe-tshiz-beo (Ital., a gallant), is a term spylied to a class of persons in Italy who constantly attend upon murried ladies. In the higher ranks of society it was formerly the custom for every married society it was formerly the custom for every married lady to have her ciciebeo, who escorted her in her walks, and accompanied her to private parties and public amusements. The practice has now almost entirely disappeared.

CICUTA, si-ku'-tu, in Bot., a gen. of plants belonging to the nat. ord. Umbellifera. C. virosa, the waterhemlock, or cowbane, is a common indigenous plant of birth pricepones autome. C. secondade a native of

of a highly poisonous nature. C. maculata, a native of America, has very poisonous roots, which, from having been mistaken for those of harmless Umbellifera, have

been mistaken for those of narmies Conventyers, have not unfrequently led to fatal results.

Cm, sid (Arab. scid, lord), is the name of an epic poem of the Spaniards, celebrating the exploits of their great national hero Roderigo Diaz, commonly called the Cid. The poem is supposed to have been written in the 12th or 13th century, but nothing is known of the collection.

its author.

CIDER, or CYDER, si'-der (Fr. cidre), the expressed and fermented juice of apples. The apples are thrown into a circular stone trough, and bruised by a heavy round stone turned by horses, until the whole are reduced to a pulp called "must." The must is then spread upon a haircloth, several of which are piled together and placed under a screw press; the screw is turned slowly, and the juice exudes, flowing into a flat tub; from this it is poured into casks placed in a position where there is a free current of air. The inquor ferments, and the clear cider is drawn off from time to time: this is again racked until it is perfectly The fermentation of cider is a very difficult process, requiring great experience to determine when it is going on too slowly or too quickly. In England, cider is made principally in the Herefordshire district, where the above method of pressing is adopted, and in Devonshire, where a screw press of rude form is employed. Cider requires great care in keeping, being apt to turn sour, and has lately fallen into disuse on account of great quantities of "doctored" sour cider having been retailed by dealers and publisour cider having been retailed by dealers am puni-cans. Cider is also made in Normandy, Belgium, and Germany. A powerful spirit is obtained from cider by distillation.—Ref. Callivation of Orchards and Making of Culer and Perry, by Falkner. CIGAR MANUFACTURE. (See TOBACCO MANUFAC-

TURE.)

CHIUM, sill-i-um (Lat.), is a name given in Anat. to the eyelid or eyelash; and hence the term ciliary is applied to the arteries, glands, &c., belonging to

the eyelids.

CINCHONA, sin-ko'-na (named after the Countess del Cinchon), in Bot., the typical gen. of the nat. ord. Cinchonacea. The plants of this genus are natives of the intertropical valleys of the Andes, and are found principally on the eastern face of the Cordilleras, component the circumstance of the Cordilleras, growing commonly at heights varying from about 4,000 to nearly 12,000 feet above the level of the sea. The cinchona region extends from Santa Cruz de la cherra, in Bolivia, about 19° S. lat., through Peru and Columbia, nearly to Caracas, in about 10° of N. lat. The plants are small shrubs or large forest-trees, with appear to require great moisture, and a mean temperature of about 62°. The cultivation of these plants has lately been commenced in India. The barks of several species and varieties are extensively used in medicine. and are undoubtedly the most valuable drugs known. They are imported into this country under the names of Cinchona, Peruvian and Jesuita' bark. Twenty six different varieties have been described by Pereira; and Wedgell has enumerated no less than thirty-nine. The most important are Loxo, or crown bark; grey, silver, or Huanuco bark; Calisaya, or yellow bark; 507

### Cinnamomum

and red bark. These four are officinal in our phar copesias, and are the principal sources of the pre-alkaloids quina or quinine, ciuchonia, and quisi which are all used in medicine, and possess in eminent degree tonic, febrifugal, and antiper properties. The barks themselves have similar properties. Like Darks themselves have builded perties, and are, moreover, slightly astringent, name compliment to the countess of Cinchon, whose band was the viceroy of Peru. She had derived band was the viceroy of Peru. She had derived benefit from the bark during her residence in America; and on her return to Europe, in 1639, the brought with her several specimens. The native scientific one, being gunguino and guna-quino. The medicinal use of the bark was first made known in Europe by the Jesuits. (For a full account of the numerous varieties of cinchons bark found in commerce, see Royle's Manual of Materia Medica.)

CINCHONACEE, sin-ko-nai se-e, in Bot., a nat. ord. of dicotyledonous plants in the sub-class Corolliform, including about 2,550 species, which are grouped into alls genera. They are trees, shrubs, or herbs, with opposite, simple, entire leaves, and stipules between the leaf-stalks on each side (interpetiolar). The estyr is superior, the corolla regular; the stamens are equal in number to the teeth of the calyx and see ments of the corolla, being alternate with the latter; they are attached to the corolla (epipetalous). The overy is inferior, and 2- or more celled; the fruit inferior, with one seed, or sometimes more than one The Cinchonacea are almost exclusively natives of tropical and warm regions. They yield many valuable medicinal agents, the most important being quining (see CINCHONA) and ipecacuanha (see CEPHARLIS). They also furnish man with many substances useful in the arts and domestic economy; such as dye-stude, tanning agents, edible fruits and seeds, and ornamental woods. The collec-plant belongs to this extensive order. (See Correlation) Most of the plants have been tiful and fragrant flowers, and many have been introduced into our stoves.

CINCINNATI, The, sin-sin-näll-s, was a society or order of certain officers of the United States army, established in 1783, with Washington at their head-They took their name from Cincinnatus, the Romain general who left the plough to defend the state. As the order was made hereditary, it was regarded by many as contrary to the spirit of republicanism, and

became so unpopular that it at length ceased to exist.

CINERARY URNS. (See VASES.)

CINERARY, sin'-na-bar (Gr. kinnabari), the principal ore of mercury, from which the greater proportion of all the mercury of commerce is obtained. It is a bisulphuret, and contains 86.2 parts of mercury and 13.8 parts of sulphur. Native cinabar is found mas-sive and crystallized in six-sided prisms, rhombs, and octohedra. It is of various colours, sometimes appearing steel-grey, and at others bright red. It is not found in Britain, but occurs in France, Hungary, and Spain, in Siberia and Japan, and in large quantities in South America. It has also been imported from China. Native mercury and native amalgam of silver are sometimes found accompanying cinnabar. Under the name of vermilion, cinnabar is used as a pigment, when refined. Hepatic cinnabar is a variety containing a little carbon, and so called on account of its liver-brown colour, from the Greek word hepar, the liver.

Cinnamonum, sim-dimo'-mum (Lat.), in Bot., a gen. of plants belonging to the nat. ord. Laurasea,

including many species remarkable for their aromatio niciding many species remarkants for their arounds properties. C. zeylanicum, the cinnamon-tree, a native of Ceylon, is extensively cultivated in that island, also on the Malabar coast, in Java and Cayenne, for the sake of the aromatic bark of the young branches, which forms the true cinnamon of commerce. Cinnamon of commerce of medicinally see mon is much employed as a spice, and medicinally as a cordial, stimulant, carminative, astringent, antispas-modic agent, and as an adjunct to other medicines. It owes its properties to the presence of a volatile oil and tannin. The volatile oil is imported from Ceylon, where it is obtained from the rejected bark by distillation. It is known by the name of oil of cinnamon, and is used medicinally aspa stimulant, and by cooks and confectioners for flavouring. From the leaves of the

PRIVE STATE

### Cinnanton

tree another volatile oil, similar to oil of cloves in odour and taste, is prepared. From the ripe fruits a concrete fatty substance called cinnamon suct is ob-



twined by expression. The cinnamon-tree is the kinnemon or kin-man of the Bible, C. cas-sia, a native of China, yields the cassia bark of commerce, which possesses analogous possesses properties to those of From this cinnamon. bark the fragrant oil of cassia is obtained. The cassia buds of commerce, which are now much used as a condi-ment, are said to be the flower-buds of this

plant. The cassis-tree plant. The cassis-tree plant. The cassis-tree points of the Bible. Several other species of cinnumomum yield aromatic barks.

CINHAMON. (See CINHAMONUM.)
CINNAMON. (See CINHAMONUM.)
CINNAMON. STORE, sin'-nō-mon, a species of garnet, also called essonite, of a light cinnamon-yellow colour and high lustre. If carefully cut and skilfully polished it commands a good price. It is a silicate of alumina and lime. (See GARNET.)
CIPHUR, si-fer (Arab. sifr, empty or destitute of, is a term applied to the figure 0. It is sometimes also applied to a swithwaters' conventily.

applied to arithmetical characters generally; and hence the verb "to cipher" signifies to perform an arithmetical operation. A cipher is also a funciful arrangement of the initials of a name, sometimes adopted by artists and others in order to distinguish their works.

Circus, ser'-kl (Fr. cerele, Lat. circulus), in Geom., is, according to Locke's definition, "a line continued till it ends where it began, having all its parts equidistant from a common centre." The bounding line distant from a common centre." is called the circumference or periphery. Any straight line drawn through the contre and terminating in the and drawn through the centre and terminating in the circumsterence is called a diameter. The circle is one of the elements of plane geometry, the right line being the other; and those constructions only are regarded as geometrical which can be made by the aid of these two elements. The circle, however, derives its chief importance from its application in trigonometry to the measurement of angles. This application is dependent on the fact, that if circles of the same radii be described from the vertices of angles as centres, the arcs of the circles intercepted between the sides are always pro-portional to the angles. It is for this reason that the circle is almost aways employed to compare angles with each other. For this purpose the circumference of the circle is divided into four equal parts, each of

of the circle is divided into four equal parts, each of which is called a quadrant; ench quadrant is divided into ninety equal parts, called degrees; each degree is divided into sixty equal parts, called minutes; each minute into sixty equal parts, called seconds.

CIRCLE, in Log., is applied to a kind of false reasoning, in which the principle is supposed which it is intended to prove, and afterwards the principle is proved by the thing which it seemed to have proved. The same fault takes place in definitions, when an idea is defined by others which suppose the knowledge of the first. the first

OTHERE, MAGIC, the circle or space within which magicians work their enchantments, and which are believed to protect them from the evil spirits which they raise. A piece of ground is usually chosen, nine feet square, at the full extent of which parallel lines are drawn, one within the other, having sundry crosses and triangles described between them, close to which is formed the first or outer circle. About half a foot within the same a second circle is described, and within that another square space corresponding to the first, and in the centre is the seat or spot where the master and his associate place themselves.—Ref. Smedley's

### Circumoision

the Norfolk, the Oxford, the Northern, the Western, the South-Wales and Chester, and the North-Wales

und Chester. (See Assize.)
Cincular Norks, sir-ku-lar notes, are a kind of bank-notes, issued by certain of the London bankinghouses for the convenience of travellers. They are each of the value of £10 or upwards, and along with them the traveller receives a list of the agents in the different places where they may be cashed. The great advantage of these notes is, that the traveller may exchange one or more of them at different parts of his route, and receive their full value in the money of the country, without any charge for commission.

CIRCULAR SAILING. (See NAVIGATION.)

CIRCULATING LIBRARY. (See LIBRARY.) CIRCULATING MEDIUM, sir-ku-lai'-ting me'-di-um, in Pol. Econ., is the medium by which exchanges or purchases and sales are effected, whether that he gold or silver coin, paper, or any other article employed as the measure of the value of other things. It is scarcely possible to imagine a people living without a circulating medium of some kind; and accordingly we find, even among the most savage tribes, some articles to which they refer as a measure of wealth, whether these be slaves, skins, or cowry-shells. (See CURRENCE.)

CIRCULATION OF THE BLOOD, sir-ku-lai shun (Lat. circulus, a circle), in Physiol., is applied to the course of the blood through the body, from the heart to the capillaries, and from the capillaries back again to the heart. The several organs of circulation are the heart arteries, veins, and capillaries. By the heart the blood is propelled through the arteries to all parts of the heart the blood. body. The capillaries are very minute vessels, con-necting the extremities of the arteries with those of the veins, and by the veins the blood is returned again to the heart. The heart is composed of two distinct cavities, separated from each other by a partition or septum, and termed the right and left sides of the heart; the right being also termed the venous or pul-monic heart, the left the arterial or systemic heart. Each of these sides is subdivided into two cavities, the superior being termed the suricle, the inferior the ventricle. The blood which has been distributed by the arteries through the different parts of the body, passes from them, by means of the capillaries, into the The veins from the lower part of the body veius. empty themselves into the inferior vena cava, and those from the upper part into the superior vena cave, and both pour their contents into the right auricle. This contracts, and forces the blood into the right ventricle, contracts, and forces the blood into the right ventricle, which, in turn, forces it through the pulmonary artery to the lungs, where, by the action of the air, the venous blood is purified and changed into arterial. It is then conveyed by the four pulmonary veins into the left auricle, whence it passes into the left ventricle, from which it is propelled into the aorta, and by this means distributed to all parts of the body. The pulse which is felt in the arteries is caused by the action of the heart propelling the blood in wayse through the heart. heart propelling the blood in waves through the body. The discovery of the circulation of the blood is due to Dr. Harvey, afterwards physician to Charles I.; the opinion previous to his time being, that the blood circulated only in the veins, and that the arteries, from being always found empty after death, contained nothing but air; and hence their name.

Checumension, sir-kum-sir-zhun (Lat., a cutting round), is the cutting off the prepute or foreskin,—a rite common among eastern nations, both ancient and modern. Abraham was commanded by God to circumcise himself and all the males of his household, and to transmit the custom to his posterity. It took place on the eighth day after birth, and is still very sorupuon the eighth day after birth, and is still very sorunu-lously observed by the Jews. There is indubitable evidence to show that the rite was practised by the Egyptians long before the time of Abraham; and Herodotus and others mention its having been prac-tised among various ancient nations. In modern times it has been found practised through a great part of Africa and Asia, and even in Mexico, the West Indies, and various parts of South America. Among the Mohammedans, as well as by the Jews, it is regarded as a religious rite. Circumcision was established among Occult Sciences.

Ozours, sir-kits (Fr. circuit, Lat. circuitus), are the Home, the purpose of an archigious rite. Circumoision was established among right divisions of the kingdong, for the purpose of and his seed; and it was declared that "the uncircumbolding the serizes. They are the Home, the Midland, cised man child whose skin of his foreskin is uncircum-

# Circumcision, Feast of

cised, that soul shall be cut off from his people; he hath broken my covenant."

CIRCUNCISION, FRAST OF, is a festival observed by the Church in commemoration of the circumcision of

Jesus Christ, held on the eighth day after Christmas, or

the 1st of January.
CIECUMPLEX sir'-kum-flex (Lat. circum, round, and flecto, I bend), in Gram., is an accent marked thus A, and is placed over a syllable to denote that its sound and is placed over a syllable to denote that its sound is intermediate between acute and grave. It is seldom used in the present day except to show the omission of a letter, which makes the syllable long and open; as Bâle for Basle.

CIRCUMLOCUTION, sir-kum-lo-ku'-shun (Lat. circum, and loguer, I speak), is a circuitous mode of expression, used either when the proper term for expressing an idea does not naturally and immediately occur, or

when a person wishes to avoid expressing in direct terms something disagreeable or inconvenient.

CIRCUMSTANTIAL EVIDENCE. (See EVIDENCE.)
CIRCUS, ser-kus (Lat.), a large inclosed space, of colong form, adapted for horse and chariot racing, sports to which the encient Romans were much adsports to which the encient Romans were much addicted. The circus was also used for athletic games and the contests of wild beasts. There were many buildings of the kind in Rome, of which the Circus Maximus and Circus Agonalis were probably the largest. According to different authorities, the former margest. According to different authorities, the former was capable of holding between 200,000 and 400,000 speciators. The Circus of Nero was begun by Caligula; part of its site is now occupied by the Basilica of St. Peter. All the circi which existed in ancient Rome are completely destroyed; but near the tomb of Cocilia Metellus, not far from the Appian Way, about two miles from Rome, there is a circus, commonly called the Circus of Caracalla, in a high state of pre-servation; it is small in size, but probably resembles servation; it is small in size, but prousby resembles closely the larger circ in general form. In length, the Circus of Caracalla is about 1,300 feet, and 300 feet wide. The long sides are not quite parallel; one end is semicircular, and the carceree, or covered stalls, furnished with gates, are there eituated. In the carceres the chariots and horses remained till the starter gave the signal, when the gates were opened. Along the sides, and round the opposite end from the carceres, were ascending ranges of stone seats for the spectators. There is a bas-relief in the British Museum which gives a very tolerable notion of the appearance of an ancient circus. The modern circus does not resemble that of the ancients; it is small in size, and is generally a temporary erection, consisting of a ring surrounded by raised seats for the spectators. The principal amusements are feats of horsemanship and acrobatic displays.

CISSAMPELOS, sis-sam'-pel-os (Gr. kissos, ivy; ampelos a vine), in Bot., a gen. of plants belonging to the nat. ord. Menispermacea. The root of C. Pareira, a climbing plant indigenous in Brazil, is an article of our Materia Medica, and is commonly known as Pareira brava. It possesses bitter, tonic, and diuretic properties, which are chiefly due to the presence of an uncrystallizable

alkaloid named cissampeline or pelosine.

CISTACRE, sis-tai'-se-e (Gr. kiste, a box or capsulc),
in Bot., the Rock-rose fam., a nat. ord of dicotyleonous plants in the sub-class Thalamiform, consisting of seven genera and 185 species, chiefly natives of the south of Europe and north of Africa; they are shrubs or herbs. The leaves are entire; the are shrubs or herbs. The leaves are entire; the senals and petals have a ternary or quinary arrangement, and are twisted in astivation, the former being persistent and the latter caducous; the stamens are hypogynous and distinct; the overy has perietal placontas, and a single style with a simple stigma; the fruit is capsular; the seeds have mealy albumen and embryos inverted, curved, or spiral. The Cistacca have resinous and balasmic properties. From species of the

# Oltizen

and was so called from having its first establishment at Citeaux (Cistercium). Through the exercions of St. Bernard of Clairvaux and others, this order had increased in power so rapidly, that within a hundred years creased in power so rapidly, that within a number years of its foundation it embraced 800 nch abbygin different parts of Europe. It became so powerful, that it governed almost all Europe, both in temporal and spiritual concerns. The Cisterians dedicated themselves to a contemplative life, and their rule was severe. Cardinal De Vitry says they neither wore skins nor shirts, nor ate flesh, except in sickness, and abstained smrts, nor are near, except in stokness, and anstance from fish, eggs, milk, and cheese. They lay only on straw beds, in their tunics and cowls; rose at midnight and sang praises to God till break of day; spent the day in labour, reading, and prayer, and in all their exercises observed a strict and continual silenes. Towards the end of the 12th century, however, riches and indolence began to operate unfavourably on their discipline, and led the way to great corruptions. Many of the convents had ceased to exist before the Reforma tion, and many more speedily after that event. In the reign of Edward I, there were sixty-one Cistercian monasteries in England. The habit of the order is a white robe or cassock, with a black scapulary and a woollen girdle. Many eminent men have sprung from it.

(See WATER SUPPLY.) CISTERN.

CITATION, si-lai-shun (Lat. cilatio), a summons to appear, applied particularly to process in the spiritual courts, where they proceed, according to the course of the civil and canon laws, by citation.

CITHARA, sith'-a-ra, an ancient musical instrument, supposed to have resembled the lyre; its precise con-struction, however, is now unknown. The cithera had struction, however, is now unknown. at first only three strings; but the number was increased at different times to eight, nine, and, lastly, to twenty-four.

Cities of Refuge, sit-ees, were six cities (three on each side of Jordan) which God commanded Moses to set up for a refuge for the children of Israel, and for the stranger and for the sojourner among them. that every one that killeth any person unawares might fee thither, and find refuge from the avenger of blood. The manslayer was to remain there until the death of the high priest, after which he could return to his own land. They were Hebron, Sheehem, and Kadesh-Naphthali on the west side of Jordan, and Bezer, Ramoth-Gilead, and Golan on the east. It is said that at every cross-road signs were set up, pointing the way

to the cities of refuge.

CITIZEN, sit-i-zen (Fr. citoyen, Lat. civis), is, by
Aristotle, defined to be one who participates in the judicial and legislative power in a state; and in this sense it could only be applied in those states in which the people had some share in the sovereign power. In ancient Greece and Rome, citizens enjoyed numerous important privileges and immunities, which they watched over with the most jealous care. Among the rights enjoyed by Roman citizens was that of holding rights enjoyed by itoman cluzens was that of holding public offices in the state; of voting in the public assemblies of the people; of appealing to the people against any sentence of the magistrates, or act of oppression on the part of others; of making a will, and succeeding to an inheritance; and of having the power of life and death over their children. No magistrate could order a Roman citizen to be put to death, por to could order a roman citizen to be put to death, nor to be punished by stripes. Citizenship was only obtained by birth, or conferred by a public act. Noterm of residence, or the circumstance of being born in the city, conferred that right. Neither could any one claim citizenship by birth unless he was born of such a marriage as the state considered legal,—all marriages between citizens and freed slaves, or their descendants, between citizens and freed slaves, or their descendants, were illegal. To be a citizen, it was necessury to be an inhabitant of Rome, to be enrolled in one of the tribes, and to be capable of dignities. There was also a lower class of citizenship, which conferred no right of voting or of holding public office. The practice of admitting aliens (peregrini) to the rights of citizenship became more and more common as their territories extended; and at length the emperor Caracalla granted the freedom of Roman citizens to all the inhabitants of resinous and balsamic properties. From species of the typical genus Cistus, a fragrant resinous substance, a lower class of citizenship, which conferred no right called Ladanum, is obtained in the Levant. This is need medicinally as an expectorant and emmenagoue, and is much esteemed by the Turks as a perfume. A gum called Kuteera, which is sometimes substituted in India for tragacanth, is the Froduce of a plant of this order, named Cochoppermum Gosuppium.

CISTERGIAES, sis-ter'-st-ins, a religious order originally established by St. Robert, abbot of Molesme (1068),

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### Citric Acid

well as to all persons who are born anywhere of a British citizen, or of one whose father, or father's father, was a citizen of Great Britain. Commonly the term citizen is employed to denote the inhabitant of a town. In France, a citizen is one who has been born in the country, or is naturalized in it.

Cirric Acid, et frik, a powerful tribasic acid, found principally in the lemon, lime, orange, and other members of the Aurantiacea fam. It also occurs in other acid fruits, such as the gooseberry, raspberry, strawberry, and tamarind. It is procured by neutralizing lemon or lime juice with chalk, and decomposing the insoluble citrate thus formed with sulphuric acid. Citric acid is very soluble in water. It crystallizes in transparent colourless rhombic prisms, which have an agreeable acid taste. Citric acid is a tribasic acid, and forms three citrates of soda, for instance, containing one, two, and three equivalents of acid united to an equivalent of base. The alkaline citrates are all soluble in water; so also are many of the metallic citrates. The most important of these is the citrate of lime, by the decomposition of which citric acid is formed.
When subjected to destructive distillation, citric acid undergoes a remarkable change. It first melts, and parts with its water of crystallization. At 350° Fahr, decomposition commences, guses are given off, and the residue consists of acontic ucid, an acid found and the residue consists of aconstic acid, an and found in aconite. If the heat be continued, staconic acid is formed. Citric acid may be looked upon as the hydrated teroxide of cetryl, a hypothetical radicle. Citric acid is very valuable as a mordant in calicoprinting; it is also used in pharmacy, in the manufacture of lemonade and syrups, and occasionally in photography. Combinations of citric acid with iron and armonic are much used in medicine. It is also and ammonia are much used in medicine. It is also used in the preparation of effervescing draughts. The antiscorbutic properties of lemon-juice are due to the presence of citric acid. (For a detailed account of the combinations and derivatives of citric acid, the reader is referred to Gerhardt's Traité de Chimic.)

CITRINULUS, OF CITRINUS, sit-ri'-nu-lus, si-tri'-nus, old names for a kind of stone between a crystal and a beryl, formerly called saxifragus, and believed to be lithestriptic.

CITRON, OIL OF, sit'-ron, a fragrant oil procured by distilling the flowers of the Citrus medica, much used

in perfumery.

CITRONELLE, OIL OF. (See ANDROPOGON.)

CITRUS, 8i'-trus (said to be from the town Citron, in Judes), in Bot., a gen. of plants belonging to the nat. ord. Aurantisacco. The different species and varieties of this genus yield the fruits known under the names of orange, lemon, lime, shaddock, pompel-moose, forbidden fruit, kumquat, and citron. The species C. Aurantium, and its varieties, produce all the various descriptions of sweet oranges, the most important of which are the St. Michael's, the blood-red, the Maltere, and the common oranges. They are imthe Malters, and the common oranges. They are imported in immense numbers from the Azores, Lisbon, Malta, and Sicily. C. Bigaradia, or vulgaris, yields the bitter, or Seville orange. The orange-tree is remarkable for its prolificness: thus, a single plant will sometimes produce as many as 20,000 good oranges. The small unripe fruits of C. Awantium, as well as those of C. Bigaradia, are used for flavouring Curaçon, being called orange-berries; when polished in a lathe they constitute the ordinary usue peas of the shops The leaves of both species, when distilled with water rield a volatile oil, which is called oil of orange-leaf, or seems de petit grain. Their flowers yield the fragrant oil known as oil of Neroli, which is the most important ingredient in eau de Cologne. The distilled water of the flowers is named orange-flower water. By distilling the rind of the ripe sweet orange with water, a fra-grant oil, named essential oil of sweet orange, is ob-tained. The rind itself is used in medicine as an arotained. The rind itself is used in medicine as an aromatic, stimulant, and tonic. The juice of the fruit forms matic, stimulant, and tonic. The juice of the fruit forms a refreshing beverage, and in medicine a valuable refrigerant. The bitter orange is chiefly used for making marmalade. Its rind yields a volatile oil called essential oil of bitter orange, and is used medicinally, and two making condicat orange-peel. C. Limonum and its varieties produce the fruits called lemons, the chief varieties of which are the wastemon, the imperial bemon, and the Gasta lemon. They are chiefly im-

#### Civat

ported from Sicily and Spain, those from the latter country being most esteemed. Both the rind and juice are employed in medicine, the former as an aromatic and stomachic, and the latter for its re-frigerant and antiscorbutic effects. The juice con-tains a large quantity of citric acid, and is extensively used for flavouring and to form the refreshing beverage

called lemonade. The rind contains a large quantity of essential oil, which is obtained from it by expression or by distillation, and is known as the essen-tial oil, or essence of lemon. This oil is principally used as a flavouring agent in confectionery and in me-dicine, and occasion-ally in perfumery. Candied lemon-peel is a common ingredient in puddings and cakes. C. Limetta is the source of the lime. This fruit is generally imported into this country in a preserved state, and in



CITRON.

that condition it forms a most agreeable dessert. juice is also imported, and largely employed, with that of the lemon, in the preparation of citric acid. C. medica yields the fruit called the citron, which is supposed to be the Hebrew tappuach. This word is translated in the English version of the Old Testament as "apple." The rind of the citron is imported in a pre-served state, and is used in confectionery. The pulp is less acid and juicy than that of the lemon. Two essential oils used in perfumery are obtained from C. medica. They are named respectively essence, or essential oil of citron, and essence of cedrat, or cedra. The citron, lime, and lemon, are distinguished from the orange by The citron, their adherent rinds, their more lengthened form, and by the occurrence of a more or less preminent protuberance at the apex. C. Bergamia, which yields the Bergamot orange, so largely used in perfumery, is generally regarded as a mere variety of C. Limetta. (See BERGAMOT.) Besides the above fruits obtained from the genus Citrus, we have the shaddock, from the species. C. decumana; the forbidden fruit, from C. Paradisi; the pompelmoose, from C. Pampelmos; and the kum-

quat of China, from C. japonica.

CITY, sit'-e (Fr. cité, Lat. civitas), is applied to certain large and important towns, both in England and other countries. It is commonly said that a city is a borough or a town-corporate, which is or has been the seat of a bishop; but this is not strictly correct, for there are many examples of towns in England which were once the seats of bishops, which are never called. cities. The term seems rather to have been anciently applied as complimentary to certain towns of principal note and importance. A city differs in no-respect, except that of superior dignity, from an or-dinary borough.—Ref. English Cyclopadia—Arts and

CIVET (Viverra), siv'-et, a native of North Africa. Its size is about two feet six inches in length, and ten or twelve inches in height; head long; muzzle sharp, as in the weasel; a narrow bristly mane runs from the pole of the neck to the tail. Its colour is brownish grey, with black bunds and spots. It is a carnivorous animal, and preys on birds, small quadrupeds, and rentiles. The true civet's most remarkable feature consists of a sort of pouch between the anus and sexual organs, in which collects an odorous liquid of considerable value in the perfume-market. For the sake-of this it is very commonly kept in confinement. The perfume is removed from the pouch about twice a week. The quantity yielded is about a dram at each removal. Great care has to be observed during the pouch-emptying process; for the civet has a decided objection to it, and will struggle its hardest to avenge itself on the operator. Whether the ferocity of the true civet is caused by their anxiety about the safe-keeping of their secretions, cannot, of course, be explained; but it is

#### Civet

certain that those who, on account of the valueless contents of their pouch, are not operated on, are com-



paratively of amiable disposition, and will even become domesticated.

CIVET, a substance secreted by the Viverra civetta, or divet-cat. In any quantity the odour is over-poweringly disgusting; but, diluted infinitesimally, its perfume is most agreeable. It is extensively used by Parisian perfumers, but the English manufacturers

rarisan pertuners, but the English manufacturers prefer the use of musk.

Civic Crown. (See Crown.)

Civic it (Lut. civilis, from civis, a citizen), that which relates to the community, or to the policy and government of the citizens and subjects of a state.

CIVIL DEATH, is where a man, by an act of parlinment or judgment of law, is attainted of treason or felony, by which he loses his civil rights and capacities, and becomes, as it were, dead in law. Formerly it took place, also, where a man abjured the realm, or went into a monastery and became a monk, in which cases he became dead in law, and his estate fell to the next heir.

CIVIL LAW .- By this term, absolutely taken, is generally understood the civil or municipal law of the Roman empire, as comprised in the Institutes, the Code, and the Digest of the emperor Justinian, and the Novel constitutions of himself and some of his successors. Like the canon law, it has no force where it is repugnant to our common law, it has no lored where it is pengiamin to our common law, and the courts of the latter will prohibit any excess of jurisdiction, if attempted by any tribunal dealing with the civil law. (See Canon Law.) Crvit. List, was formerly applied to the list of all the expenses of the civil government of the

of all the expenses of the civil government of the country. Down to the time of the Restoration, the whole expenses of the government, civil and military, were included in one list; but a distinction was then made between the military and the civil expenses of the government. During the reign of William III. the amount of the civil list averaged about £680,000 annually. Under this head were included the expenses of the royal household, of the privy purse, maintenance of the royal palaces, salaries of the lord chancellor, judges, officers of state and ambassadors at foreign courts, incomes to the members of the royal family, secret money, pensions, &c. In succeeding reigns the amount of the civil list was much increased, until, by I Will, IV. c. 25, it was confined to expenses proper for the maintenance of the royal household, and the sum of £510,000 granted to his majesty exclusively for the maintenance of the royal household, and the sum of £510,000 granted to his majesty exclusively many curves the splains and expresses of the for the privy purse, the salaries and expenses of the household, secret-service money, and pensions. The civil list is fixed in the first session of parliament after the accession of the sovereign, and is understood to be granted for the whole period of his reign. Her Majesty's civil list was settled, as in preceding roigns, on her accession to the throne, by 1 & 2 Vict. c. 2. In terms of that act she surrendered the hereditary revenues of the crown for life, in consideration of an annual sum of £385,000, for the support of her majesty's household and the honour and dignity of the crown. The application of this sum is intrusted to the lords of the treasury, and it is apportioned among the several branches as follows:—Privy purse, £60,000; retired allowances, salaries, and wages, £131,260; expenses of household, £172,500; royal bounty, alms, and special services, £13,200; beaving an unappropriated surplus of £8,040; but at the end of each year the lords of the

## Civil Service

treasury are authorized to direct that the savi treasury are authorized to direct that the navings any one of these classes may be applied in aid of a charges under any of the others. In addition to a above sum, £1,200 is granted to her Majesty for as and every succeeding year of her reign, cumulative for the payment of pensions to "persons who have a claims on the royal beneficence, or who, by the performance duties to the public, or by their useful discoveries, science and attainments in literature and the arts, his persisted the gracious consideration of their security. merited the gracious consideration of their sovereign and the gratitude of their country." It is further provided, that if in any one year the civil-list charge should exceed the total sum of £400,000, then an a count of the particulars of the excess shall be laid before parliament within thirty days.

CIVIL SERVICE, is applied to that department of the government service which is neither naval nor military. In it are included the post-office, customs, inland rewar-office, Admiralty, Board of Trade, courts of law, diplomatic corps, &c. The following are the amounts voted for the several branches of the civil service for the year 1869-70.

I. Public Works and Buildings II. Salaries and Expenses of Public De	£1,228,806
II. Salaries and Expenses of Public De partments	1.733.681
III. Law and Justice	3,712,426
IV. Education, Science, and Art	1,628,170
V. Colonial and Consular Services	
VI. Superannuations and Charities	
VII. Special and temporary objects	
Civil contingencies	131,174
Total	£9 530 158

The number of persons employed in the civil service in any capacity (excluding law courts and law offices) was, by the last return, as follows:—

	15 11
I. Heads of departments (political, 34; non-	190
II. Sub-heads of departments and heads of branches	1,469
Clerks (established, 13,768; temporary, 389)	14,157
III. Professional officers (superior, 1,922; m- ferior, 1,921)	3,843
1V. Inferior officers (in-door, 2,259; out-door, 36,566)	38,825
\ Artisans and labourers	20,010
VI. Persons not wholly employed, women, &c.	14,941
Total	103.058

In the fixed civil service there are two kinds of offices: there are, first, what are called the staff, or special appointments, t. e., certain situations to which men are appointed at once, irrespective of any previous connection with the comine. are appointed at once, irrespective of any previous connection with the service. These are usually the highest offices, which rank, in point of dignity and emolument, next to the ministerial offices, but differ from them in being held permanently. Bistinct from staff appointments are what may be called graduated appointments, or those which are arranged in an ascending scale, so that one must enter at a particular ascending scale, so that one must enter at a particular stage, and pass through the lower in order to reach the higher. As a general rule, clerkships in all departments of the service are graduated appointments, one entering as a clerk of the lowest grade, with a salary of £80 or £90 a year, and gradually working his way upwards. There are, however, many other kinds of offices that are thus graduated, as in the post-office and custom-house. Of the salaries enjoyed by the different classes of officials the following is an approximation. Of those styled heads of departments the salaries may be said to range from £1,000 to £5,000, but the majority are under £2,500. The salaries of cecreaties and chief clerks range generally from £1,000 to taries and chief clerks range generally from £1,000 to £2,000. Sub-heads of departments, and heads of branches, have usually from £500 to £1,500 a year, varying with the nature of their occupations. The varying with the nature of their occupations. The great body of clerks in the public service may be distributed into four classes, those in the lowest having

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cataly of £80 or £30 s year, and those in the highest from £500 up to £700 or £800. Of the office-keepers, messengers, porters, artisans, labourers, &c., the salaries or wages may be said to range from £150 a year down to under £1 a week. The chief doorkeepers and messengers of the houses of parliament, however, have salaries ranging from £150 to £400, or more, per annum. Formerly appointments to the civil service were obtained chiefly by favour, and frequent complaints were made as to the inefficiency of the servants. In 1854 a commission was appointed, which reported most unfavourably on the existing system of appointments; and hence, by an order of souncil, dated £1st May, 1855, it was ordained that commissioners be appointed to examine young men proposed for any of the junior situations in the civil establishments, and grant certificates to such as they shall find duly qualified, having previously ascertained that they are within the prescribed age, free from physical defect or disease, and of good moral character. After receiving his certificate, the candidate enters upon a six months' probation, during which his conduct and a six months' probation, during which his conduct and capacity for business are tested, and, if found satis-There are two kinds of examinations,—pass and competitive. In the pass examinations,—pass and competitive. In the pass examinations there are no marks assigned, the candidates being reported upon by epithets as to the nature of their work. In competitive examinations marks are employed. (See Examination.) The ages for admission are generally fixed at between 18 and 25. In 1860 there were 2,631 persons nominated for examination; and of these, 317 were rejected in the non-competitive examinations; 103 were ineligible on account of age or other causes. Of the competitive account of age or other causes. Of the competitive meminations, 603 only were examined; and of these, 407 were unsuccessful; 319 were not considered to have been qualified, if they had possessed absolute nominations. On retiring from the civil service, the servant receives a pension for the rest of his life, proportioned to the period of his service and the amount

of his salary.

OIVIL WAR, a war between the inhabitants of the same state, or the citizens of the same city,—one of the greatest misfortunes that can befall a nation. The Wars of the Roses, the war between the Parliament and Charles I., in this country, and the present struggle between the Northern and Southern states of America, are the most notable civil wars since ancient

times.

CIVILIAN, sip-il-yan (Lat. civis, a citizen), a popular term signifying a person who is neither clerical, military, nor naval by profession. In Law, a civilian is a person who has studied the law and principles by which civic rights may be vindicated honourably, either in general society or in the special state to which he belongs. The civil law of nncient Rome was much studied in all the states of Europe in former times, and greatly influenced the formation of many musicinal systems. Those who devoted much study municipal systems. Those who devoted much study to the nature of these laws were called cicilians; and on account of the more severe character of the studies required, the term gradually was applied to the pro-fessor or doctor, as distinguished from the practitioner of laws. At present, in this country, the term is still applied to a student or teacher of Roman civil law.

applied to a student or teacher of noman civil new.
CEVILIZATION, six-id-zai-zai-zain (lat. circ, a citizen),
is one of those terms in common use which it is difficult
accurately to define in words. It is derived from the
Latin word sivis, a citizen, probably from those who live
in citize being more civilized than those who inhabit country parts, or from the living in cities being one of the great characteristics of civilized life. "Whatever." asys J. S. Mill, " be the characteristics of what we call savage life, the contrary of these, or the qualities which assage life, the contrary of these, or the qualities which society puts on as it throws off these, constitute civilization. According to Guizot, the fundamental idea of civilization is progress or development,—the perfecting of civil life or of society, properly so called; but-comprising, also, the development of the individual internal life, the development of man himself, of his fagulities, his centiments, his ideas. Hence civilization subsists on two conditions, and manifests itself by

of advancement from the savage state to that higher and more perfect condition which both reason and revelation lead us to believe to be the ultimate deatiny of the human race. The history of civilization is the history of this progress, either in nations or in the race. It is a subject of the utmost importance, sud, as yet, little has been done towards its elucidation. According to M. Guizot, the history of civilization may be considered under the different spacers and treated be considered under two different aspects, and treated in two different ways. The historian may either place himself in the heart of the human mind for a given period, a series of ages, or among a determinate people, studying, describing, and relating all the events, transformations, and revolutions which had been accomplished in the internal man, and he would then have a history of civilization amongst the people and in the period he had selected; or, instead of penetrating the internal man, he may take his stand in the midst of the world, and, instead of describing the vicesitudes of the ideas, the sentiments of the individual being, he may describe external facts, the events and changes of the social life. These two modes of treating civilization are intimately connected together; they are the reflection and image of each other. As we view the history of the human race from the earliest times to the present, the progress of civilization is very marked. It is not, indeed, in one undeviating straight line, nor is its course constant and uninterrupted. Sometimes it has the appearance of being at a stand-still, or even to be going backward; but this is only for a brief space, snatching, as it were, a breathing-time, in order with the greater vigour to again pursue its onward course. Very remarkable changes, too, have taken place among those nations that from time to time have occupied the foremost place in history. Nation after nation has, for a time, taken up the beacon-light, running with it onward for a time, and, when it begins to falter or fail, succeeded, as it were, by another of stronger and fresher energies. Many nations that once occupied the ran in civilization have passed away, and live only in name. These are not confined to one district of country, nor even to one continent; at one time in Africa, at another in Asia, now in Europe, and anon it may be in America or Australia (when the New Zealander shall come over and contemplate the ruins of Saint Paul's). It seems as if, in each succeeding nation that arose, and under each clime, there were cer-tain elements that favoured its growth for a time, and at a particular state of its progress; and that, when these were exhausted, the people that furnished them perished as useless. Or does it not rather seem, in most cases, that the very people that were ministering to the advance of civilization in one direction were, in another, imbibing the very poison of which it was purifying itself, and thus accomplishing their own destruction? In it not thus that the very refinements of civilized life have been the bane of so many? What, then, are the causes at work in producing these changes,
—in effecting this progress? This is the most important in connection with civilization, and this ought to be the great aim of its history. They are evidently of a twofold character,—internally in the race and externally in nature. The external or physical agents by which the human race are most powerfully infin-enced are, according to Mr. Buckle, climate, food, soil, and the general aspect of nature. But that these external agents are not all, or, perhaps, even the main agents at work, is evident from the fact that we find nations living under the like external circumstances, and yet in very different states of civilization. The external circumstances in Greece and Rome were the same This is one of the great errors into which Mr. Buckle has fallen. He overlooks the importance of the fact connected with the difference of race. Much as there is of error and loose reasoning in Mr. Buckle's book, it is undoubtedly a work of great ability, and is one of the first attempts made to systematize the history of civilization. It is deeply to be regretted that the premature death of the author has left us only a fragment of the work. Mr. Buckle contends that it can be shown by positive epidence that human actions are two symptoms,—the development of social activity and governed by fixed laws, and that "when we perform an that of individual activity,—the progress of society and action, we perform it in consequence of some motives the progress of humanity. Civilisation denotes a state or motives; that these motives are the results of some

Chadonia

antesedents; and that, therefore, if we were sequented with the whole of the antecedents, and with all the laws of their movements, we could with uncerfug certhe mind over external agents; and the time distrements.

The measure of civilization in his view, is the "triumph of the mind over external agents;" and that in Europe the tendency has been in man to triumph over nature; the tendency has been in man to triumph over man. The out of Europe, in nature to triumph over man. The only possible way of arriving at a scientific knowledge upon these subjects lies, he thinks, in studying the mental phenomena, not simply as they appear in the mind of the individual observer, but as they appear in the actions of mankind at large." While admitting that human actions are governed by fixed laws; yet it is doubtful how far the limited faculties of man will admit of his ever heing able to arrive at any satisfacadmit of his ever being able to arrive at any satisfac-tory knowledge of them. Whether a science of human action be possible is a question which Mr. Buckle has failed to solve. The circumstances "which influence the condition and progress of society are innumerable, and perpetually changing; and though they all change in obedience to causes, and therefore to laws, the in obsdience to causes, and therefore to laws, the multitude of causes is so great as to defy our limited powers of calculation."—(Mill's Logic.) The four leading propositions which Mr. Buckle regards as the bases of the history of civilization, and holds to be the most essential for the right understanding of history, are—"1. That the progress of mankind depends on the success with which the laws of phenomena are investigated, and on the extent to which a knowledge of these laws is diffused; 2, that hefore such investigation can begin a spirit of seambefore such investigation can begin, a spirit of scepbefore such investigation can begin, a spirit of seep-ticism must arise, which, at first aiding the investi-gation, is alterwards aided by it; 3, that the dis-coveries thus made increase the influence of intel-lectual truths, and diminish relatively, not absolutely, the influence of moral truths,—moral truths being more stationary than intellectual truths, and receiving fewer additions; 4. that the great enemy of this move-ment, and therefore the great enemy of civilization, is the protective spirit; by which I mean the notion that society cannot prosper unless the affairs of life are watched over and protected at every turn by the State and the Church; the State teaching men what they are to do, and the Church teaching them what they are to believe."

CLADONIA, klu-do'-ne-d, in Bot., a gen. of Lichens. C. rangiferina is the reindeer moss, so termed from constituting the principal food of the reindeer. C. pyxidata is commonly termed cup-moss; it has been em-

ployed as a remedy in hooping-cough.

CLAIM IN CHANCERT, klaim, is a proceeding, in certain cases, by which equitable relief may be obtained without special leave of the court, or filing a bill of complaint. It is lodged in the record and writ or compliant. 15 is louged in the record and write clerks office, on which the court takes cognizance of the matter. The cases in which proceedings by claim may be instituted are,—1. Where the plaintiff is, or claims to be, a creditor seeking payment out of a deceased person's personal estate. 2. A legatee under a will seeking payment out of the personal seast. a will seeking payment out of the personal assets. 3. A residuary legatee seeking an account of the residue, and payment or appropriation of his share. 4. A person entitled to the personal estate of an intestate seeking an account of such estate, and payment of his share thereof. 5. An executor or administrator of a deceased person seeking to have the personal estate administered under the directions of the court. 6. A legal or equitable mortgagee, or person having a lien as security for a debt, seeking foreclosure or sale, or otherwise to enforce his security. 7. A person entitled to redeem in the last-mentioned cases. 8. A person entitled to a specific performance of an agreement for sale or purchase of any property. 9. A person entitled to an account of purtnership transactions dissolved or expired. 10. A person entitled to an equitable estate or interest, and seeking to use the name of his trustee in prosecuting an action for his sole benefit. 11. A person estatled to have a new trustee appointed in a ase where there is no power in the instrument creating the trusts to appoint new trustees, or where the power cannot be exercised, and seeking to appoint a new trusteo.

CLAIRFOYANCE. (See SOMNAMEULISM.) CLAMP. (See JOINEBY.)

Clarichord

OLAF, klin (Gael, clann, children or descenden common successor), it is body of men united Sensets by common ancestory, or some other tree. It is an particularly applied to those associations or driber the Scotch Highlands which are united together one common name, and are supposed to be descess from a common ancestor, of whom the chief is the life. from a common ancessor, or whom the enter is the interest representative. This system of clauship was essentially patriarchal, and similar to that which still exists among the nomadic tribes of the East. It was thus entirely different from the feudal system formerly prevailing in Europe; and hence it sometimes happened that the chiefship and the estates occupied by a clan were centesting and the estates occupied by a olar were vested in different persons. The Highland claim formerly enjoyed a bad fame among the lowland Scots for their predatory habits. "Being divided," says Camden, "into families, which they call claims, what with plundering and murdering, they commit such barbarous outrages, that their cavage orucity habs made the law necessary which enacts that if one of says, when bath acquirited a treester the vest shell exacts. clan hath committed a trespace, the rest shall repair the damage, or whoever of them is taken shall suffer death

CLANDESTINE, klan-des'-tin (Lat. clandestinus), in applied to anything done secretly, without the know-ledge of the parties interested, or without the proper-solemnities. Hence a marriage is said to be claudestine when performed without the publication of banns and the knowledge of parents or guardians. (See

MARBIAGE.)
CLAQUE, klak (Fr. claquer, to clap the hands), is the name given to the means by which public perform-ances are secured a favourable reception. In Paris, one M. Santon established, in 1820, an office for the assurance of dramatic success, and was thus the origin-ator of the so-called Parisian claque. Sometimes when the success of a piece is very doubtful, as many as from 300 to 500 claqueurs are sent to applaud it. They are even frequently instructed in the details of the piece, and shown beforehard what parts they are to appland. They have also particular parts assigned to them: the laughers (rieurs) must laugh at every joke, the weepers (pleureurs) weep at all the moving passages, the chatquillers seek to keep their neighbours in good humour, while the bisseurs encore particular parts of the performance.

CLARE COLLEGE, CAMBRIDGE, klair, was founded by Lady Elizabeth, sister and co-heir of Gilbert, earl of Clare, in 1326. At present it consists of a master, eight senior and nine junior fellows, besides scholars, students, and foundation-servants. The seventeen fellowand toundation-servains. The seventies remove ships are perfectly open to all persons who are bachelors of arts, or of a higher degree, without any limitation as to age or length of standing in the university. There are eight scholarships of £00, eight of £40, and eight of £20 per annum at this college. The number of undergraduates in 1870 was 70; of members on the boards, 285.

CLARE, NUNS OF THE ORDER OF ST., were instituted by St. Clare at Assisi, in Italy, about 1212, and subsequently confirmed by Popes Innocent III. and Hororius III. They observed the rule of St. Francis, and were habits of the same colour with those of the Francisco III. ciscan friars. Hence they were called Minoresses, and their house without Aldgate, London, where they first settled when brought over into England, about 1293, the Minories. They had only three houses in England

besides this one.

CLABENDON, THE CONSTITUTIONS OF, klär-en-don, in English Hists, were certain ordinances made at a general council of the nobility and prelates, assembled by Henry II. at Clarendon, in Wiltshire, A.D. 1164. These enactments, sixteen in number, were designed to check the power of the pope and his dergy, and to limit the total exemption which they claimed from secular jurisdiction.

secular jurisdiction.

CLIET, klär-et (Fr. clairet, from clair, clear), a name used in England to denote the red wine of Medoc, and a term generally applied to the light red wines of France. Clairet, in France, signifies those wines which are red or rose-coloured; but the word, as used by us, and employed to describe every description of lightred wine, is unknown in France.

CLARICHORD, or CLAVICHORD, klin's-kord (Lat. clorus, clear; chorda, aestring), a keyed instrument.

resembling in form a spinet, now almost extinct. The strings are supported by five bridges, and covered with pieces of cloth, which soften and, at the same time, so deaden the tone, as to prevent its being heard at any countdershle distance. On this account, it was formerly much used by nuns, as they could practise it without disturbing the silence of the dormitory.

CLARION, kile-uses (Fr. claivon, from Lat. clarus, clear), a kind of telement whose tube is narrower, and tone more scute, than the common trumpet. It is said that the clarion now in use amone the Moors served

that the clarion new in use among the Moors served anciently for a treble to several trumpets, which sounded tenor and bass.

Charloner, blar co-net' (Fr. clarinette), a musi-i wind instrument, invented about the close of the 17th century by a German named Denner, and first introduced into Great Britain about 1779. It consists of four parts; viz. the mouth-piece (on which a flat reed is fastened), the upper joint, the middle piece, and the bell, or bettom piece; and has thirteen holes, the of which are stopped by keys. To these keys the instrument is indebted for its chief use, as, before their invention, it could not be employed in concert, as at present. Although chiefly used in concerted music, in which its charming effects are too well known to need encomium, its fulness and sweetness of tone as a solo instrument is extremely pleasing. This instru-ment bears a nearer resemblance to the female voice than any other extant. Some great improvements were made in wind instruments about eleven years since by M. Boehm, who brought the acoustical proportion of the subes and finger-holes into correct num-bers and measurement, by which means flutes, oboes, clarionets, &c., may be theoretically constructed. He also invented a mechanism for the keys, which gives much greater facility and precision to the execution.

CLASS, kias (Lat. ciassis), in Bot., a group of orders possessing some important structural characters in common. In the system adopted throughout this work, we have the classes Monocotyledones, Dicotyleidones, and Acotyledones, which present certain distinc-tive characters in their embryos, from which they derive their names; and they present, morcover, other important anatomical differences.

Classic, klds-sik, is a term derived from the Latin word classici, the name given to the first, or highest class of Roman citizens. Hence it came to be applied figuratively to writers of the highest rank, and this is the sense in which it is commonly used in the present day. The highest and purest class of writers in any language are termed the classics; but, in a more limited sense, the name is given to the best writers of ancient Greece and Rome. In another sense, and as opposed to modern, it is applied to the productions of

ancient Greece and Rome.

CLASSIFICATION, klüs-sij-s-kai'-shun (Lat. classis, a slass), in a general sense denotes the arrangement of a variety of objects into groups or classes, according to their resemblances or differences. It is from power of abstraction in the human mind,-the power of considering certain qualities or attributes of an object, apart from the rest, that classification is possible. We assurtment or arrangement can be formed among things not perfectly alike but by losing sight of their individual or lesser peculiarities, and limiting the attention to those which they have in common. properties that may be adopted as the basis of classification are very various, as may be seen in the nume-rous botanical, geological, and other systems. When the properties on which the classification is based are arbitrarily selected, the system is said to be artificial; when they lie in the essential nature of the objects themselves, it is natural. "The ends of scientific (or matural) plassification are best answered when the objusts are formed into groups, respecting which a greater number of general propositions can be made, and those propositions more important than could be made respecting any other groups into which the same things bould be distributed. The properties, therefore, ac-cording to which objects are classified, should, if poscorang to when objects are classified, should, if pos-nible, be those which are causes of many other proper-ties, or, at any rate, which are sure marks of them. Causes are preferable, both as being the surest and most direct of marks, and as being themselves the preparties on which it is of myst use that our attention

should be strongly fixed. But the property which is the cause of the chief peculiarities of a class, is, unfortunately, seldom fitted to serve also as the diagnostic of the class. Instead of the cause, we must generally select some of its more prominent effects, which may serve as murks of the other effects and of the car

"The end of classification as an instrument for the investigation of nature, is to make us think of these objects together which have the greatest number of important common properties, and which, therefore, we have oftenest occasion, in the source of our inductions, for taking into joint consideration. ideas of objects are thus brought into the order most

conducive to the successful prosecution of inductive inquiries generally."—J. 8. Mill's Logic.
CLAVICIE, or COLLAR-BONE, klav's-kl (Lat. classicala, from clavis, a key), in Anat, is the bone which extends horizontally from the sternum to the scapalis, and serves to keep the shoulders apart, that the arm may enjoy a freer and wider range of motion. It takes its name from its resemblance to the ancient Roman key. Its sternal end is thick, strong, and expanded, while the acromial end is broad and flattened, and presents an oblong surface, in order to articulate with the acromion process of the scupula.

CLAY, kin [Say along] and it is curved somewhat in the form of an italic

CLAY, klai (Sax. clag) .- Clay is formed from the disintegration of felspathic rocks by the combined action of the air and water. It necessarily varies in its composition, but its fundamental constituent, according to the researches of Brogniart, Malaguti, and others, may be represented by the formula AZ<sub>2</sub>O<sub>3</sub>, 2Si O<sub>3</sub>+2aq. This is as nearly as possible the composition of the fine fire-clay of the Staffordshire coal-measures. Ordinary clay contains, in addition, small portions of undecomposed rock, potash, oxide of iron, lime, and magnesia, the character of the clay being much modi-fied by the preponderance of one or other of these ingredients. One of the great characteristics of clay in its hydrated condition is its plasticity, and its carability of being made hard by heat,—properties which render the different kinds of this substance available for various fictile purposes. The purest kind able for various fictile purposes. The purest kind of clay is kaolin, or cluna-clay, which is formed by the disintegration of felspathic rocks. This species was originally found in China; but a similar description is originally found in China; but a smaller description is obtained from deposits near St. Austle, in Cornwall, and at St. Yrieix, near Limoges, in France. Kaolin is nearly pure silicate of alumina. (See Poncelative Manusacruse.)—Pipe clay is a white clay nearly free from iron, and found in large quantities in the sistend of Purbeck.—Common potter's clay contains a considerable amount of iron. The blue clay of Devention and Devention and Devention is a considerable amount of iron. shire and Dorsetshire is much valued, being very plastic, and yielding a very white paste when burni. The coarser carieties, which contain a large proportion of sand, are used for making brown stone-ware. - Brick clay contains varying proportious of iron; hence different counties build houses of different colours. clay of the midland counties contains large quantities of iron, and the bricks made from it are of a bright red thus, while London bricks are yellow or brown, from deficiency of colouring material. When the proportion of iron is very much increased, we get the different coloured celtres.—Mar! is clay containing a notable proportion of carbonate of lime. The colours known as er and sienna are clays coloured by the peroxides of iron and mangaines.—Fuller securit is a clay of a peculiar kind, which, when dried, possesses the property of absorbing grease from woollen fabrics, and is employed for that purpose. It contains a small percentage of magnesia.

CHATLAGE OF MARDESIS.

CLAY LORSTONE. (See STENCHNAS.)

CLEAVAGE, kleev'-oj (Sax. cleojan, to split), in
CTSTALA, a term applied to the property possessed by
crystals of separating into natural layers. (See CENS-TALLOGRAPHY.)

CLEAVERS. (See GALIUM.)
CLEF, klef (Fr. clef, Lat. clavis, a key), in Mus., a certain character placed at the commencement of the several stayes of a composition to determine the local names of the notes, and the sounds which they repre-sent. There are three kinds of clefs now in use; vis-the F, or bass clef; the C, or tenor clef; and the G,

### Clematidese

or troble clef. These, by the different situations in which they are placed, furnish us with a means of expressing all the notes within the usual compass of execution, either vocal or instrumental, without a confused addition of legar-lines either above or below the

CLEMATICES. Elem-a-til-de-s (Gr. klema, a tendril), in Bot., a tribe of plants in the nat. ord. Ranunculaces, distinguished by the union of the following structural points:—Calyx valvate or induplicate; fruit consisting of a number of achienia; seed pendulous. The typical genus of the tribe is Clematis, which includes several issuiffed chimbers commonly cultivated in our gardens; also one indigenous species, C. vitalba, usually called traveller's joy

CLEMENTINA, OF CLEMENTINE HOMILIES, klem-en-dr-ma, in Eccl. Hist., are nineteen homilies of a Judaising tendency, faisely attributed to St. Clement The generally received opinion is, that they were composed by an Ebionite, towards the end of the 2nd contairy

CLEMENTINES, OF THE CLEMENTINE CONSTITUTIONS, klemen-feens, is the name given to a collection of decretals of Pope Clement V., published by his successor, John XXII., in 1317, and forming part of the canon

CLERESTORY, kleer'-stor-s, in Arch., this name is applied to the windows that are pierced in the upper part or the side-walls of the nave of a cathedral or church, that rise above the arches which separate the nave from the side-aisles.

CLERGY, kler'-je (Lut. clericus, Gr. klerikos), is a term applied collectively to the whole body of ecclesiastics, in contradistinction to the laity. The distinction of Christians into clergy and laity is as old as the time of the apostles, and was derived from the Jewish economy. As soon as the Christian church began to appeal and as the contradisting to the contradiction of the cont spread, and sufficient numbers were converted to form themselves into a regular society, then certain eccle-sisatical officers were appointed among them as teachers The clergy originally consisted only of bishops, priests, and deacons; but in the 3rd century many inferior orders were appointed as subservient to the office of deacon; such as subdeacons, acolytes, readers, &c. At first, probably, the clergy were not entirely relieved from the ordinary duties of life, so that they might devote themselves exclusively to their ascred office; yet it must have necessarily been nearly so, and it is certain that they were nominated to their offices by certain peculiar forms. The privileges and immunities enjoyed by the clergy of the early church were considerable. In some cases they were exempt from the cognizance of secular courts, from certain taxes and certain kinds of obligation to which others were liable, and were excused from the burden of civil offices. Whenever they travelled, upon necessary occasions, they were to be entertained by their brethren of the clergy in all places, out of the public revenues of the church. If any controversies happened among them, they freely consented to have them determined by their hishops and councils, without having recourse to the secular magistrates. In all accusations against the clergy, especially against bishops, the character of the witnesses was inquired into before the testimony was admitted; nor would they receive the evidence of a heretic against a clergyman. The crimes involving punishment were simony, heresy, apostsey, murder, immorality, neglect of duty, &c.; and the punishments were various. Corporesi castigation and imprisonment were sometimes resorted to; degradation, suspension, deprivation, and excommunication were the other modes usually had recourse to, according to the heinousness of the offence. The laws regarding the duties of the various classes of clergy were definite and stringent. No clergyman was allowed to relinquish his station without permission; and he could not remove from one diocese to another without the consent and letters dismissory from his own bishop. In some osses they sould resign, and a retiring allowance was sometime s granted to such. Residence in their r specific enter was obligatory, and no one could hold office in two dioneses. Severe laws were enacted against wandering clergy (vacantivi), or such as, having deserted their own church, would fix in no other, but went rowing from place to place. There were also laws

# Clerk

prohibiting them from following any secular employment which might divert them too much from their price fruites. They were likewise forbidden to frequent fairs or markets, to eat and drink in taverus, or is attend public theatres. No special derical dress appears to have been in use before the 6th century. The clergy of the Church of Rome are distinguished into regular and secular. The regular clergy consists of those monks or religious persons who have taken upon them holy orders and perform the officer of the religious. them holy orders, and perform the offices of the pr hood in their respective monasteries. The secular clergy are those who are not of any religious order, and have the eare and direction of parishes. The Pro-testant olergy are all secular. In England, the berm clergy, in its ordinary acceptation, comprehends are bishops, bishops, deans and chapters, archdes rural deans, parsons (either rectors or vicers), and curates; to which may be added parish clerks, who formerly were, and yet sometimes are, in holy orders. Most of the privileges and immunities which the clerks enjoyed in England were taken from them at the time of the Reformation. Among those which they still possess are exemption from serving on a jury, or appearing at a court-leet or view of frankpiedge. They cannot be compelled to serve the office of bailiff, reserve constable, or the like; neither can they be pressed as serve during the wars. They are privileged from arrest in civil cases in going to, during, or returning from the celebration of divine service. Clergymen are disqualified from sitting in the House of Commons, nor can they engage in any kind of trade. Neither can a clergyman farm lands to the extent of more than eighty acres without a written permission from the bishop of the diocese, such permission specifying the number of years for which it is granted, and in no case exceeding seven. Clergymen are, by the ecclesiastical law, liable to be punished and corrected for loose, imlaw, name to be punnished and corrected for icose, un-moral, and profane conduct, for irreligious language, for irregularity in discharge of duty, or for presaling and maintaining doctrines contrary to the articles of the creed which they profess. For such they may be called to account by their ecclesiastical superior, by whom they may, if the charges are proved against them, be punished by admonition, suspension, degra-dation or doministic as the case way receive. dation, or deprivation, as the case may require

CLERGY, BENEFIT OF. (See BENEFIT OF CLERGY.) CLERK, klerk (Lat. clericus), was a term originally applied only to clergymen, being, in fact, a contraction of the Latin word clericus. As learning was at one time almost entirely confined to the clergy, the word naturally came to be synonymous with a learned man, or one who could write. Hence we have the double meaning of the term,—a clergyman, and a scribe, or one whose principal business is writing. In the former sense it is now seldom used except in formal documents; but from it has come a secondary meaning, in which it is applied to certain laymen appointed to conduct or lend the responses of the congregation. These were originally real clerks, i. s. clergymen, generally in minor orders, who assisted the officiating priest, Parish clerks, after being duly chosen and appointed. are usually licensed by the ordinary. By a recent enactment, persons in holy orders may be appointed to this office Until recently there were a large number of clerkships, connected principally with the courts of law, having ancient and quaint names, derived from of law, having ancient and quaint names, derived from some incident of their origin; as, clerk of the banaper, clerk of the petty bag, clerk of the pells, clerk of the pipe. Most of these were abolished by acts of paritisment in 1832 and 1837. The proceedings of the two houses of parliament, of the various courts of justice, and of the ministerial departments, are generally drawn up and recorded by clerks.—The Clerk of the Parliaments is the chief ministerial officer of the House of Lords, he and his assistant washe minutes of the of Lords; he and his assistants make minutes of the proceedings of the bouse, record its votes, resolutious, orders, and divisions, issue directions consequent upon its orders; prepare the journals, and superintend and verify the preparation and distribution of the printed documents issued by the house.—The Clerk of the House of Commons is the chief officer of that house, but now model he is desired it he marked. but nominally he is deputy of the clerk of the parliaments. He helds office for life under letters patents from the crown. He has the general charge of the official business of the house, assists and advises the

# Cleveland Ironstone

speaker in matters relating to the rules and practice of the house, and signs all orders and all bills which pass the Commons; he has the custody of all records and other documents of the knuse, and a required to take notes of all orders and proceedings, and to record the votes. The Christ of the Cross is Chancery is an officer of the crown in attendance upon the lord chancel for in maritimenest. We need to the record and success all write of lor in parliament. He makes out and issues all write of summons to peers, write for the attendance of judges, communicates to summon and proroque parlament, and depass bills. He also makes out and issues all write for the elaction of members of the House of Commons and the assection of members of the House of Commons and England and Southand, receives and has the custody of all returns to parliament for the United Kingdom, and has also the custody of all poll-books taken at elections. He also makes out all warrants, commissions, appointments, or other instruments that pass

CLEVELAND IRONSTONE (See IRON.)
CLEVELAND IRONSTONE (See IRON.)
CLIEBT, & Wo employs an attorney, solution, or proceeding, who employs an attorney, solution, or proceeding, who employs an attorney, solution, or proctor to sonduct his case in a court. Among the Romans as chent was a onizen who put himself under the protection of some great man, who, in respect of that rela-tion, was called patron He assisted his chent with his protection, interest, and goods, and the client gave his octs for his patron when he sought any office for him self or friends The 11ght of patronage was appointed by Romulus, to unite the rich and poor together in such a manner as that one might live without contempt, and the other without envi but the condition of a client, in course of time, became little else than a modern slavery. (See Attobney)
Chimacteric, kli mak-ter-ik (Lat climactericus un-

was, from climax, a ladder or steps), denotes a critical year or period in a man's life, wherein, according to astrologers, there is some notal le alteration to hapmen in the body, and the person will be exp and to give t danger of death. The idea of climateries is very ancient. According to some, every seventh year of a man's life as a climatorie of the contraction. man's life is a climacteric year, certain important changes then taking place in the lody. The ages of 63 and 61 are regarded as the grand climateries, the changes being then greater, and the danger attending these periods much increased. Others allow the term climarteric only to the product of 7 multiplied by odd numbers, as 5, 5, 7, 9, & Some, again, consider every ninth year a climacteric

CLIMATE, klv'-mut, 18 derived from the Greek word CLEARTY, kit-said, is delived from the Greek word kana, signifying inclination, but which was also applied to certain zones on the earth surface, from their supposed inclination to the pile. The space between the equator and the poles was, by the anothin geographers, divided into thirty such zones or inclinations. mata). The first twenty four, counting from the equator, were called half hour climates, because they were determined by the length of the longest day every half-hour, in its length from the equator, denoting a new climate. The last six were called month climates, because, being within the arctic circle, each was marked by an additional month of continuous sunshine alimates of ancient geographers, therefore, served 's esame purpose as our parallels of latitude. In its present and most general acceptation, the word climate may he said to include all those atmospheric conditions and changes that sensibly affect our organs, buch as heat, moiature, winds, electricity, &c The principal elements, however, that go to constitute climate are heat ments, however, that go to constitute climate are heat and monture, the latter being depend at upon the former. Heat is communicated to the atmosphere in three ways,—(1) By the direct rays of the sun, (2) three ways,—(1) By the direct rays of the sun, (2 by the reverberation of these rays from the ground and (3) by contact with the ground. The sun being that the great source of heat, it follows that, as a general rule, the temperature of a place would depend upon its latitude, or distance from the squastor, and that all places in the same latitude would anjoy the same kind of clumate. Were the would enjoy the same kind of climate Were the springs of the earth composed of a homograpous finid mass, or of strats of rock perfectly alike medicut, density, and smoothness, then this would actually be able ease; for all places in the same latitude would receive the solar rays at the same angle, and having the same capacity for absorbing and radiating heaf, would possess exactly the same climate 516

# Climate

There are, however, various diretimateness that tend to modify the climate of a country; as height above the level of the sea, inclimation of the surface, proximity or distance from the sea, the position and direction of mountain-chains, nature of the soil, state of cultivation, prevalence of particular winds. Rievation above the sea-level is one of the most important modifying circumstances, the air becoming gradually celler as we ascent; so that even in the tornal sone the summits of very high mountains are covered with perpetual snow. The nower of the suir rays in imparting heat or very high mountains are covered with perpetual snow. The power of the sun's rays in imparing least to the earth depending upon the angle at which they strike the surface, it follows that the inclination or slope of a country has an important influence upon its climate. Hence in the Alps of the Valus, for instance, on the one side may be seen the vine in lituurisant growth, whilst the other is thick-ribbed with ice. The occan is a very important element in determining the nature of a climate. Islands and districts near the sea uniformly enjoys milder and more uniform climate, than inland regions in the same latitude. In summer the sea is not so muc heated by the sun's rays as the land, and hence cooling sea-breezes temper the warmth of that season, while in winter the cold is miligited in consequence of the water retaining its heat longer than the land. Thus Dublin, though 4° in the next when I Widdlings has nearly the activities. "arther north than Hedelberg, has nearly the same mean mount temperature whilstis winters are almost 6° warmer and its summer nearly 5° cooler Mountains affect a climate in various ways, by influencing the direction of currents and by directing and condensing the appears in the atmos the supports in the atmos . The nature of the scil and the state of cultivary contrate materially upon Different kinds of so clima different powers chine principle and a region of "shating and absorbing in , and a region shrouded in forest, or covered with awamps and marshes, will have a different temp rature with a cleared and drained Maishta, ly evap ration, deprise the surface of much of its heat, and torests, by intercepting the sun ariys and by the increased exhalant sur faces exposed to the an, unfountedly after the temperature. Hence in hot climates forests tend to cool the an and in friend regions to present the loss of the carth sheat by chiling blasts. The prevalence of particular winds also influences the character of a current bringing water of a higher or a lower tempesture than that of the surrounging sea. It will thus be seen that there are nun clous circumstances that tend to modify the climate of any particular place, and that more lines of littude afford but an imperfect indestion of the temperature. Hence goographers ind citim of the temperature. Hence goographers have had recours to their lines called softhermal (Orien root, eval, and the mor, heat), which are carried through all place i having the same mean annual temperature. These lines diverge more and more and more and more are more and more and more are more and more and more and more are supported to the contract of th from the parallels of latitude as they recede from the equator In the American confinert they descend mu n lower than in Fuice, and in the southern hemisphere the mean annual temperature is much lower than in the northern, on account of its having much less land But places having the same mean annual temperature may vet have very different cli-mates, for places having a moderate summer and winter may yet have the same mean annual temperature as others where the summer and winter are extreme, Hence secouse is had to other lines indicating the mean summer and winter temperature, the former being called southerals (Greek sion, equal, and there, summer, the latter sochmenals (Greek sion, error, and chemon, winter). The second great constitutes of chemon, winter). climate is moisture, which takes the forms of rain, vapour, fog, and dew These will be noticed under their respective heads. In the torrid zone there are but two seasons, the wet and the dry. The former is regarded as the winter, the latter as the summer of these regions, but they are in direct opposition to the astronomical seasons, as the rains follow the sun. In India, however, the rainy and dry seasons are not regulated by the position of the sun, but by the change of the monscons. In some districts there are two rainy and two dry seasons; and in others rain seldom or never falls, as in the great African desert of the Sahara. Only in the temperate zones can the year be properly said to be divided into four argains, ex-

hibiting the agreeable requirement of tiens and cold, the bengorate beats of entering the health the feet of the health the feet of white in Lindly open with the rapid that me of spring and attached, in the first score only two secons are known—a long and severe water, followed by a chort but firrid summer. This hard and abroupt transition is occasioned by the great length of the day in aumaner, when for a time the sun never sets, and by the total absence of that luminary in winter. It is to the varieties in the climate of different places what we are indebted for the great variety that exists that we are indebted for the great variety that exists in the regetable and animal kingdoms Every species of plant has certain climatic boundaries, some much notes the ded than others, within which alone it will somish Animals, too, have their climatic bounds The man alone is it given to subsist in any chimals. Even him, however, different climates affect very dif ferently,—some being favourable to health, others tending to disease The study, therefore of the effects of different climates upon different constitutions and in different diseases, forms an important branch of medicine Indeed, their are few disea is that miv not be influenced by climate, and hence the necessity to the physician of making himself acquainted with the stmospheric conditions of different localities

firmax, kle make (Gr. 1/1mar), is a plied to a figure in rhotoric in which the speaker accords as it were by a series of steps from ore iden to another, each being characterized by prester in cignits or importance than its reducesse. Suithful electron among of Julius Cusan. Vem vid sir: (Cosm. I saw, I conquered). "I say a e as lord kames "must have observe!" digitir electron num ber of thenghts or a stime to articlly engosed like net of th tights or a little is attitute to 1 year in team accurate and team is an imaking impression and deep is such disposition of mumbers in a period a termed a climax." The upposite of climax is anti-climax, or a descending from greater to less important

( I BING LOCOMOTIVES AND CARRIAGE alo the invention of Mr. Lell, the celebrate Lenguage in the track the passage of a railway over in. M. nt. the there are the passages of a raisea section in the constraint of the passages between I raise and Italian as let a practical success. Mr. Italian a paper which is real before the British Association, gave a engineered description of the construction of keep the congruence. and carriages on the centre rail system ! I wilk no on steep gradent and sharp curies as cin loyed on the Mout Cenis Summit Railway Mesers \ girlles and Enceson first concerned the use of the centre sail in the year 18 0 and proposed to apply it upon the inclines of the Manchest rand Liverpool Railway, but it was not put into peration it was not till like Brassey and Mr Lell built a centre call engine and laid down a length of one on that plan on the Cromford and High Peak Railway for experimental Cromord and right reas natural for experiments purposes, in 1865, that the sysfem was jut into practical operation. These experiments were made in order to assure the Italian givernment of the feasibility of laying down a line of railway upon a similar principle over one of the Alpine passes. The mean principle over one of the Alpine passes in the mean gradient of the first 24 miles of line, from 5t Michol to Lanelberg, 14 in 60, with a maximum gradient of 1 in 12 in the other 24 miles the mean 14 1 in 17, and over the whole length there are at intervals curves of two chains radius. The line rises to an curres of two chains radius. The line rises to an elevation of 7,000 teet and in places is exposed to elevation of 1,000 term and in places is exposed to anomadrites and availanches where it runs through sintably-strengthened galleries. The system of loco-ington adopted is that of a third or traction-rail, on which adhesion as attained by horizontal wheels, worked by the engine in conjunction with, or independently of, the ordinary driving wheels, which ad suit of the weight of the engine being reduced to a minimum, whilst the pressure upon the middle rail on be carried to any required amount, and gradients of 1 in 12 worked with as much certainty and safety as these of 1 in 160. The centre rail also furnishes the means of applying most powerful brakes for con-trolling the descent of the trains, and, moreover, senders at almost impossible for the train to leave the ruds. The requirements of the Italian government included three trains a day each way; the mail-train to perform the journey at an average rate of twelve mules an hour, racingling stoppages, the speed up the

stampast enable being 73 males at black, a grown wright of the tribu was to be 68 to miled and grouds trains were to carry 40 too toos such, with two orgines. Bits eartisges, a the engines, are each, intrished with four the wheels, which have flarges moderlaspes are rail;—these sot as both guide- and safety-will rail;—these sot as both guide- and safety-will rail to the carriage from leaving the rails eight or nine railes of the line is constrated erres some of wood and some of ma

Mechanics' Magazine for 1866

CLIMEING PERCH (Anabus scanders), kill under partial (Ang. bax ) — This singular fish is an inhabitant of the pouds and rivers of most parts of the East Indies. Its general form resembles that of the common English. perch, but it seldom attains a greater length the inches "The most remarkable character press by these fishes consists in the structure of the say pharyngeal bones, which are dilated into voluntiaous folded laming inclosed in a large cavity at the base of folded laming inclosed in a large daviey or with a supply the skull, and forming numerous cells, in which a supply the shall and forming the shall be shall the shall, and forming numerous cells, in which a supply of water may be carried for the purpose of moistening the rills when the creature, as its habit is, quits the water for a time '—(Dullas) It has been assented, and that by travellers and explorers whose verseity is beyond qui stron that this singular fish has been seen to limb trees, fixing its anal fin in cavities of the bark, and urging its way upwards by distending and con-tracting its body "Though these sish are cometimes tracting its body "Though these sish are competimes compelled in their distress to travel by day, and have leen met in the glare of noon tolling along a dusty road, their migrations are generally performed at might, or in early morning, whilst the grass is yet wet with dew. (I mibing perches are plentiful in the Ganges and the boatmon have been known to keep them for five or six days in an earthen pot without witer, using daily what they wanted, and finding them as incly as when caught - Ch inhers a Engelopadia, Cirvic or C 10 thin - it, kin - ik-il (Gr. khin-is inon kin , a bed), is applied, in Med, to the other-vation and treiting at of discusses at 'e bedside of the and neuce clinical lectures are such as are given and here clinical recurres are sound as any given at the bed-side of the patient, or from notes and observations: de at the bed-side 'liss at the most valuable mode of instructing 'n the art of medicine, the students are taken to the bed-side of the patients in a public hespital and there p actically instructed in the various phenomina of discise, taught to observe the characterist a of each individual case, and to study the effects if the various modes of treatment. In modern times at least, climital medicine was entirely neglected till about the middle of the 17th century; and it was not till the beginning of the 18th that it began, by Poerbaave, to be systematically carried out Since that time it has come into general use, and now every good school has an establishment for chinical an licine in connection with it

CINICAL BAITISM, in Feel. Hist, is applied to baptism administered at the death-bed. Among the baptism administered at the death-bed. Among the herein al opinions that at one time prevailed in the Church, was, that the sacrament of baptism washed away all sing previously committed, and hence it was often deferred to near the end of hie, when there was bittle risk of singing more such persent and all the same of the same o e lange

CITAKER, kling ker (Aug -Sax ), in Min . black oxide of iron, obtained in scales from red-hot iron while in process of forging In common parlance the term is applied to the slaggy ferroginous musees that form in furnaces and stoves from the vitrification of the silica

and from contained in the coal.

and from contained in the coal.

CLio, kit-o, a gen of shell less mollusor, so exfremely abundant in the Arctic seas, that they constitute a chief part of the tood of whales. Whales food is the name by which they are known to the fisherness Sometimes the water is so full of them, that it would be impossible for a creature of so ponderous taxes as the whale to open his jaws without engulang thousands.

sands.

CLIPTER, klip'-per (Ang.-Bax, one who runs fast),
a saling-vessel built expressly for speed. Compared
with ordinary ships, a clipper is longer and narrewer; the bows, which are generally hollowed below
the water-line, are extremely sharp, and the lines are
fined gradually towards the stem. Clippers owe their

prisin to th and the openin-eleppera. duns which sail beand America are among isting. Great improvements have s and dipper ships.

MORODOGY. th kied krusk er (Ang Bax), an agri-ment used for crushing and pressing the spend form it consists of a cylindical into many pieces, all strung upon one meces actually constitute a number of micht wheels, which are notched on the outer and the formed as to prevent the tearing up of and, which, when the common roller was the rolling a growing crop, was a serious

Chair Ashanac, or Runic Stair, klog, was a kind of skinshap or calendar formerly in use in England and Beandingwis, and was usually made of wood Dr Plot, in his History of Staffordshire (1886), describes one of these instruments, which, he says, is still in use among the meaner sort of people. "It is usually," he says, the meaner sort of people. "It is usually," he says,
"a square piace of wood, containing three months on
such of the four edges. The number of days in them
are expressed by notches the first day by a notch
with a judgestized motch. Over against many of the
notches sub placed, on the left hand, several marks or
symbols desicting the golden number or tycle of the
moors. The restreats are marked by symbols of the
several salata issuing from the notches." These which
had deep in Staffordshire had only the number of severes same securing from the notices. In see which he had been in Staffordshire had only the prime and immerable feasts upon them, whereas others of a more perfect kind, preserved in the cabinets of the curious, had likewise the Dominical letters. Of the frequently, was another the Dominion letters Of the frequent facer were two kinds,—a larger for family use, which simulty hong at one end of the mantel tree of the distance, and a smaller for carrying in the pocket Specimens are to be seen in the British Museum.

CLOSSEE, kloys for (Lat. claustium, an inclosed space), in a general sense, a monastery, either inhabited by monits or nuns, who are inclosed or shut up from the world. In a more restricted sense, the term is simplified to a covered passage running round the walls of certain portions of monasteries. It usually is found extending over three sides of a square or quadrangle, with the outer walls consisting of pillars and arches, and the roof frequently erched and ornamented with tracery. In the anotest monasteries the closetrs were used for several purposes. The monks held their lecters in the oblisters, and at certain hours of the day met there and conversed together

new many short (Set olath), a manufactured substance, consisting of wool, har, cotton flax, hemp, or other vegetable-diaments. It is formed by wearing or interlacing threads, and is used for making garments or cher devening, besides being useful in a great variety of forming; basides being useful in a great variety of forming; such as woollen cloth, hair cloth, co-ten cloth, hair efoth, ac. The term cloth, however, is generally simplered to distinguish woollen cloth from fabluce mander of they other material. (See Woollen Manu

Chornes Morn Llouthe'-moth (Ang -Sax ), a name occasion to a number of small moths of the gen Tenan, whole laws are axis me axis me activative to woollen common up whumber of small moths of the gen Trace,
whose larver were actuemely destructive to woollen
falsette for Reey begin not only to eat as soon as
the property and begin not only to eat as soon as
whose singlesse hidden, and, uniting the fragments with
a glabilinus silk of their own producing, make, of the
whose constitute five in. Cleanliness and exposure to
light use which best safsgnard against these tiresome

Chown bloom (Lat claude, I shut), a condensed mass Onorgan storm (Lat cleaned I and), a concenter mass of matery rangement flast floate in the atmosphere or rests on the arrives of the earth. In the latter case the values in the fag or must a bod it is only when it uses above us that it is improved a cloud. The height to

rate clouds are frequently about height; while light fleery masses height of four or five miles. The outline of the theory of the forms rising from the moist surface of a suspension in the atmosphere, and remi is completely saturated with it, but if the from below still continues, the atmosphere overcharged with moisture, and the vapour and appears in a visible form Clouds a defined as arrus, cumulus, and stratus. The current is applied to long streaky white clouds at in all directions,—they are commonly called the tails, and are the forerunners of windy weach caus, and are the forerunners or windy weather committee, to clouds comesting of thick white this vapour, ragged and broad at the base, ascending form of mountain peaks this form of cloud mouly seen by day. The name stratus is given dense horizontal mass of cloud rising above the zon, and commonly resting on the surface of the lead.
The must that use from valleys, marshes, and water,
in the evening, belong to the class of clouds, which
are considered as the precursors of the weather.
There are compound modulications of these classes of louds, compose dof the primary me lifications various blended together they are termed curro cumulus, ou stratus, cannilo stratus, and cumulo, rro stratus, ar numbus The numbus is the dark heavy raun-dough. At Plates XXXI, XXXII, XXXIII, and XXXIV and depicted the various forms of clouds At fig. 1, Plate XXXI, is the corns in different forms, at fig. 3 the cerro stratus is exhibited, subsiding on cumula heneath; cerro stratus is exhibited, subaiding on cumula hemath; at fig. 3, Plata X XX II, is shown the currus, as seen before thunder, at fig. 4, coro numbus, danked by visro-stratus, and grung an electroid discharge, at fig. 6 as seen a range of cumula passing to cumula strati before thunder. At fig. 1, Plate XX XIII, is deputed currost ulus, at figs. 2, 2, distant cirri struti, at figs. 3, 3, cirrus passing to curro cumular at fig. 4, Plate XXXIV, at figs. 3, 3, cirrus struting, cumular and cum do tratus, grouped,—Ref. Howard's Climate of London, Boes's Cyclopautus, article Climate. article Clout

CLOILS CARTOPHY LU4 ) CLUB, Linb, 14 a term of doubtful derivation; but according to some, it comes from the Angle-Razon cleofan, or cleaf in to divide, because the expenses are to Or Johnson, is an assembly of good islows meeting under certain conditions. I had, though partiag true definition of the good old English (lubs, is limited for the term as used in the present day A cult now may rather be said to be an association of parametering under certain conditions, or subjected for tain rules, if may be for purposes of convivality uniting their separate efforts for one common w or each contributing a share to one common fund The idea of a club is a number of for mutual benefit persons united together for one common object. England is unquestionably the place for clubs. The first club of which we have any account was that tam one which met at the Mermand taxon, of the land o Shakspere, Ben Jonson, Beaumont, Fletcher, Rufett Sulden, and others, were members Ben Janson Ma wards founded another club, which met at the Lie wards founded another club, which met at the Lievitarein, in Fleet Street. It was, however, and fall the early part of last centrary that clubs becamed a great institution. There then flourished the Brothers Club, Scriblerus Club, October Club, Hansoverian Club, Scriblerus Club, October Club, Hansoverian Club, Street Club, the Kit-Club at the street of the street Club, and their among their members. He celebrated, the distributions of the control of the street of the street

Club Boot

Street, and was invited to two Among its regulations were, this around not been then supposed that norms then expects that some length effects of the services, and him to see the present should have a general see of the services. The services the services are desired than the services of the services. The clube of the present day are perstantially investigations that their members with the constant of a home in the highest style of elegance strainers at a very moderate rate. They include seems and news-room, drawing room, library. Institutions at a very moderate rate. They include in the said news-room, drawing room, library, a waiting room, library, a waiting room, and other apartments, with greatly representations. Wines and properties are supplied to the members at cost price, the sense of the establishment being defrayed out of a lund arsung from entrance-fets and the anunal scriptons. The members are admitted by ballot, their encepters are usually restricted. The follow. sobscriptions The members are admitted and their numbers are usually restricted I be following as a list of the principal clubs in London, with tae ther of their members, entry money, and annual authoriotion -

	Members limited to	Lutrance f. e L. 1	Annual Sul L *
Alfred .	600	8	48
Army and Navv	1 4.0	3) ()	6 11
Arthor's	€ 00	21 0	10 10
Atheneum	1 200	_6 5	6 6
Boodle's	-		
Brooke's	575	99	11 11
Cariton	800	15 15	10 10
City of London		26 >	6 6
Conservative	1 500	26 )	ьь
Coventry House	F 10	12 12	12 12
Brechtbeum	£00	"1 O	77
Guresok	300	1 , 13	66
Guards	****	-	
Junior United Service		1) ()	5 5
Oriental	800	21 0	8 0
Oxford & Cambridg		2( 5	6 6
Parthenon	700	21 0	7 7
Beform	] <b>1</b> (I()	21 5	10 10
Travellers'	700	21 0	1) 10
Union,	1 000	32 11	6 6
United Service	1 500	30 0	6 0
University Club	1 000	26 5	6 0
White's	, 70		-
Windham	6.0	26 5	8 0

CLUB FOOT is a distortion of the foot, cocasioned by the greater contractions of some must leathan others, I which means the feot is drawn or tof its natural position may be inwards or cutwards, with the elevation of he heel and depression of the toes, or the depression of the beel and elevat on of the toes and fore part of Such deformities are usually congenital sometimes they n ay arise from some disordered which of the system or be occasioned by convulsions. This deformity may now, in almost every case, be cused by a pareful subcutaneous division of the con-

tracted tendons

Chip Law is the law of force, from club, signifying
a thick heavy stick

a thick heavy stick.

CLYS-NOSS (See I NCOPODIUM)

CLUNY, OF CLUGNX, MONKS OF THE ORDER OF, kleft | N. | See the first branch of the order of Benedictures, and took their name from the town of Clagsit, in France, where they were first established The Benedictures having become very lax in their discribing. Odds, about of Clugus, in 927, not only invisted on a rigorous observance of their rules by the monks under simp, but the wise introduced new cerumones of a savager nature. These new rules soon came to be observed in the principal monasteries in France. Spain. a several listure. These new rules soon came to be observed by the principal monasteries in France, Spain, Raff, Germany, and Britan, and by the 12th century the order numbered 2,000 closters in different parts of Europe. All the monasteries of this order in England wasp governed by foregners, and were subject to foreign houses; and it is said that it was not till 1857 that they were entirely freed of all subjection to lorsing althous. Cont

wife (Lat. olup e world.

ne world. Criver, k'a'-se-a (in honour of Charles de Bain celebrated French botanist), in Bath, a gast, of the celebrated French continues. The latinum of a celebrated French cotainst, in Mol., a gas, or belonging to the nat ord. Guttofore, The maison of Jamaica is C flavo, and this, with the maison allowed process, yield a glutinous remines matter, in some parts of the West Indies in flavor of In Nevis and St Kitt s the three species are in indiscriminately by the names of int post; and apple, and mountain or wild mango

apple, and mountain or wild mange CLU-IAGE#, kile state see. or Bot, the mann some times given to the nat ord Gutty from, which see. CLU-INTER, kile 'fer (Gr Liuso, I wash out), sign have given to certain medicines administered as a Significant, by means of an injecting syringe, by the vectom for the purpose of procuring evacuation of the process. or otherwise affecting the intestines or the system generally In cases of lock jaw, &c, when with the curnot be conveyed by the throat, it is negociatine a luministered in this way. The nature of clysters de pends upon the olject they are designed to effect; sed they may be emolient, anodyne, purgetive, or latering cent Clysters are sometimes used in order to relieve construction, and for this purpose tepti was gruel is commonly employed. The frequent this means, however (except by medical ways very injurious, as it impairs the tone of the allow canal, and units it for the performance of its func-tions. For the purposes of nutrition, best tea or null is commonly employed, administered in small quantities. Medicues introduced into the rectangle, a which form are called suppositories.

a wind form are called suppositories

CLYUN, \$\hat{kl} \cdot and spotted with yellow Many sorts of direct found on flowers, to which they resort for the seal the pollen

(See Ventcles) COACH

COADUTOR, ke de juin (Lat con or sum, with, and a juior, an assistant) is a fellow-helper, or one engaged in the assistance of another. In confermatical Lauten

engaged in the assistance of another. In ecclemental matter, a conductor is one appointed to assist a lishop in his episcopal duties.

Loat, Tole (Sax cal or coll), is a mineral of vegetable origin. The hypotheses of the best authors are based upon the assumption that the occurracts of vegetable remains of all kinds in coal affords convenients. The enument geologist Six Cherles Legell, who has paid great attention to the phenomena of the conversion of coal, thus states his views.—"It appears conversion of coal, thus states his views —" It appears from the researches of Luebig and other emment chemists, that when wood and vegetable matter are buried mats, that when wood and vegetable matter are bursed in the earth exposed to mostime, and ignetiably or entirely excluded from the an, they decompose slowly and evolve carbonic and gas, thus parting with a pertino of them original oxygen. By this means they become gradually converted into lightly, or wood cost, which contains a larger portion of by drogen than wood does. A continuation of decomposition changes that lightle into common or butumnous coul, chiefly by the discharge of carburetted hydrogen, or the gas with which we illuminate our six sets and houses. According to Burchoff the unflammable cases which are slawer. which we illuminate our streets and houses. Ascording to Bischoff, the inflammable gases which are silverys escaping from mineral coal, and are so offer the cause of fatal accudents in mines, always contain serbours acid, carbiretted hydrogen, nitrogen, and desiast gas. The disengagement of all these rapidly insistential ordinary of bituminous coal into antiractic, to which the names of splint coal, hard coal, and many others, have been given." Mineralogists commonly divide coal into the non-bituminous and the blasminous. The non-bituminous variety includes antiractic, is coal with a bright lustre, often submetalic, iron-biact, and trequently indescent, it is opaque, the insistent being

Coal

conchoidal; usually it contains 60 to 60 per cent, of carbon, 4 to 5 of water, with some castly impurities, anthractice differ much in beginning and readiness of combustion. Forest note is an American variety, more compact than artificial coles, some kinds containing considerable bitumen; its origin is attributed by Genth to the action of a trap artiplica on bituminous coal. Cales is a kind of anthractic shale; in parliamentary returns the term is made use of to designate anthractic. Of oftensions coal there are saveral varieties. Pitch, or astring coal, when bested, breaks into small places, which, on the heat being raised, unite in a solid mass; its colour is velvet-black, or greyish black; specifingsravity, 1 289; it burns readily with a yellow fame; but requires fraquent stirring to prevent its raking, by which the ingress of air for combustion is prevented. Caking coal containing about 87 per cent. recrice. Caking coal containing about 87 per cent. t shundant product of the British coal-measures. mry soal resembles caking coal, but does not coften ke when heated : it is very frangible; and hence, and cake when heated: it is very frangible; and hence, in mining it, there is considerable waste. Near Birmingham, the loss in mining, including the pillars, amounts to two thirds of the whole. It burns more rapidly than caking coal, with a clear yellow flame. Soften coal is a dry coal, harder than cherry coal: it is a cearne kind of chunel you. There are other varieties which are still less biruminous; the finit coal, which are still less biruminous; the finit coal, which are still less biruminous; the finit coal, which approaches authracite, being of this kind. The first coal of Wednesbury, in Staffordshire, is of a similar nature; and the crow coal of Cumberland, at Alston Moor, is almost without bitumen. Cannel coal has a dark greyish-black or brownish-black colour, a fine compact texture, a large conchoidal fracture, and receives a good polish. It abounds at Lesmahago, about twenty miles from Glasgow; also in different parts in Ayrahire, where it is made into inkstands, and boxes, and similar articles. It is obtained in clear rectangular blocks of smooth and perfectly clear ce. It is remarkable for the readiness with which it kindles, being lighted at once in the flame of a lamp, and continuing to burn with a clear yellow flame without melting and running down. This property renders it well adapted for illuminating purposes, and has extract for it the name of cannel, which is the promunication of the word candle in Lancashire, where the name was first applied. This variety is found in the United States of America, in Western Pennsyl-vania, in Virginia, Ohio, Kentucky, and Missouri, rania, in Virginia, Ohio, Kentucky, and Missouri, sometimes in beds of considerable size, but oftener forming layers in the bede of the common bituminous cost. Jet resembles cannel coal, but is blacker, and has a more brilliant lustre. It occurs in detached bas a more orman number. It is the guarder of pieces in clay on the coast near Whitby, in Yorkshire, it is the guarder of Dioscorides and Pliny, a name derived from the river Gagas, in Syria, near the mouth of which it was found. Brown coal is more recent in of which it was found. Brown coal is more recent in origin than the Carboniferous era of the geologists. It sometimes resembles common bituminous coal. Other varieties have a brownish-black colour, bright coallike lustre, with something of the texture of wood re-

maining; and often, as when the form and fibre of like original tree is retained it is turned Hypote, which may be regarded as wood in a process of charge. It is the least rich is carbon, containing not more than 60 or 70 per cent. Coal, shemically considered, is need pas of the most important of mineral products. Whether we consider the enormous number of useful materials extend to the most important of mineral products. consider the enormous number of media makes tracted from it by chemical means, or the wast a of light shed upon obscure points of absenced during the investigation of the properties of products, it still remains the most reliable interesting substance, both to the practical maturer and to the chemical philosopher, that has been bestowed on man. Extensive beds of the conference of the con been bestowed on man. Extensive seem of many coal occur in Great Britain, covering about one to of the whole area, or 11,859 square unites, in Fair in Spain, in Belgium, covering about one twee second the whole area;—in the Netherlands, Frank Austria, Northern Italy, Spain, Russis on the so near the Azof. It is found in Asia, abundantly Chins, in Persis, in the Cabul territory, and in China, in Persia, in the Cabul territory, and an Khorassan, or Northern Persia; in verticus parts of India and Upper Assum; in Borneo, Labran, Samatra, several of the Philippine islands, Formoss, Japan, New South Wales, and New Zeeland. In America, besides the United States, in Chill, at the Straits of Magellan, on Vancouver's Island, as well as in the British provinces of Nova Scotia, New Brunswick, and Na-Saundland. In England the principal coal-Midda Newfoundland. In England the principal coal-fields are the Manchester, of Lancashire and Cheshire; the Great Central, of South Yorkshire, Nottingham, and Derby; that of South Wales, Glamorganshire, &c., and the Newcastle field, of Northern England. In Scotland a range of beds extends from the Firth of Forth to the Firth of Clyde, over an area of 1,450 aquare miles. In Ireland there are the Limerick fields, about the mouth of the Shannon, the Kilkeuny fields to the eastward, and those of Ulster in the north. In the United States there are four extensive coal areas: one of these areas, the Appalachian coul-field, commencies on the north in Pennsylvania and South-eastern Chic, and sweeping south over Western Virginia and Eastern Rentucky, and Tennessee, it continues to Alabams. It has been estimated to cover 65,000 square Alabams. It has been estimated to cover 60,000 equate miles. A second coal area (the Illinois) lies adjoining the Mississippi, and covers the greater part of Illinois, the western portion of Indians, and a small northwest portion of Kentucky. A third occupies a portion west portion of Kentucky. A third occupies a portion of Missouri and Iowa, west of the Mississippi. A fourth covers the central portion of Michigan. Besides these, there is a smaller coal region in Khode Leland, which crops out acrops the north end of the island, and appears to the northward as far as Manafield, Massachusetts. Beyond the borders of the United States on the north-east commences the coal area of Nova Scotia and New Brunswick, which covers, in connection with Newfoundland, 18,000 square miles, or two units of the whole area of these provinces. R. C. Taylor, in his extensive work on coal, gives the tollowing table, showing the proportional areas of coal land in Europe and America :-

	Entire Area in each Country.	Area of Coal Land,	Proportions of Coal to their whole Areas.	Relative parts in 1,000 of Coal Access.
Great Britain, Ireland, Scotland, and Wales Spein (Asturias region) Preson	Square miles, 120,290 177,781 203,736 11,372	Square miles. 11,859 3,408 1,719 518	1·10 1·53 1·18 1·21	94 19 9
United States (exclusive of Pennsylvania) Pennsylvania British provinces of New Brunewick, Nova Scotia, Capa Breton, and Newfoundland Pression Denthions Austria	2,280,000 43,960 91,113 107,937 150,000	15,437 18,000	117 13 14) —	64 #0 

In the sectrostred intilation of coal its elements com-biles smoone themselves to form a variety of useful stances, such as water, &c. Among these products, according to the temperatures em-bosides the carbonaccous residue called soke, and the 520

coal gue used for illuminating purposes, may be named oral ter, naphtha, naphthaline, paradine, benzole, coal oil (called by Dr. Lyon Playfair "liquefled coal gas"), and several other compounds. A description of these substances and the products obtained from them will be found under their respective heads. "Coal is of all minerals the most valuable, as it involves the employment of the largest amount of human labour and leads to the most important results. By it we obtain heat and light for all the insin purposes of life, and without it none of the modern contrivances for rapid fecometion would be available. Although by no means remous it none of the industrial contributes for rapid flocomotion would be available. Although by no means the only fuel, it is so convenient, so portable, so cheap, so readily transported without serious injury, and so abundant, that we could hardly carry on any of our most profitable manufactures in this country without it. The great coal-mining districts are, almost without exception, the seats of our industry in iron, clothing, glass, pottery, and other manufactures, for the soie reason that fuel is the most essential of all minerals, and that its price governs the cost of manufacture."

Brande's Dict. In mining for coal, the first process is that of boring, whereby the existence and depth of a bed of cost are ascertained. Afterwards a shaft is sunk for working the mineral; suitable hydraulic machinery is working the mineral; suitable hydraline machinery is set up for the purpose of draining off the water, and the sides of the shaft are securely faced with masonry of jointed ashlar; or, when the alluvial crust of the mine is formed of soft wet earth, the sides are kept up by planks of oak. Should there be much water in the mine, a shaft must be sunk for the express purpose of pumping it off. In this case, a second shaft is sunk for the raising of the coal, and as an upcast for the ventito coal-mining in the last edition of Ure's Dictionary of Arts, Manufactures, and Mines, says: "The most approved arrangement of shafts for a large colliery yielding explosive gas, and where water has to be pumped, is to sink a shaft for pumping, another for raising coals, and a third for ventilation or upcast, at the bottom of which is kept burning a large furnace. the bottom of which is kept turning a large nurnace.

... In British practice there are four different systems of working coal-mines. 1. Working with pillars and rooms or boards, styled post and stall, where the pillars left bear such proportion to the coal excavated as is just adequate to the support of the incumbent strata. 2. Working with post and stall, where the pillars are left of an extra size, and stronger than may be requisite for bearing the superior strata with the intention of removing a considerable portion of each massive pillar, whenever the regular working of post and stall has been finished in the colliery. 3. Working with post and stall, or with comparatively narrow rooms or boards, whereby an uncommonly large proportion of coal is left, with the view of working back towards the pits, whenever the colliery is worked in this manner to the extent of the coal-field, and then this manner to the extens of the constant and taking away every pillar completely if possible, and allowing the whole superincumbent strate to crush down and follow the miners in their retreat. 4. Working the long way, being the Shropshire and Derbyshire method, which leaves no pillars, but takes out all the coal progressively as the workings advance. On this plan the incumbent strata crush down, creeping very than the control of the cont plan the inclineers strate crush down, creeping very close to the heads of the miners. The post-and-stall system is practised with coals of every thickness. The long-work method is adopted generally with thin coals; for, when the thickness exceeds six or seven fact, and there is only little refuse made in excavating the coal to cast into the excavated part, this mode has been found impracticable." As a rule, the shaft of a miss is circular, and is, according to circumstances, from five to ten feet in diameter. When the first workable seam of coal is reached, the process of pitsinking is for a while discontinued, and a wide straight passage, called a "bord" or "gate," is opened up in opposite directions. This passage opens up the whole height of the seam of coal. When this bord has been excurated some distance into the sides of the pit, nar-row passages, called "headways," are driven from it row passages, called nearways, are driven from it at right angles. These passages are made to connect with other bords which have been opened up parallel with the first, or "mother-gate." By proceeding in this way, the entire bed of coal will, in time, be excavated, the roof of the mine being supported by in-521

mense square or rectangular pillars of coal left standing between the passages. During these operations the water has to be drawn off to the surface by the aid of a powerful steam engine erected above the shafe. of a powerful steam engine erected above the shafe. This engine also raises the coal and rubbish. In mines where "fire-damp" is not ferred, the pitman works by the light of a candle stuck in a piece of moist clay; but where explosions have to be guarded against, the safety-lamp is used. When the pitman who excavates his way through the bord has brought down a sufficient quantity of coal, it is conveyed to the surface, where it is frequently passed over screens, in order to separate the large lumps from the smaller and more pulverized coal. The number of collieries in existence in the year 1866 was 3,188. In the year 1863 the number reached no higher than 2.307. There 1953 the number reached no higher than 2,397. There 1953 the number reached no higher than 2,397. There are twelve inspectors of collieries; one for the north division of Durham, Northumberland, and Cumberland; one for South Durham; one for Derby, Notta, Warwick, and Leicester; one for Cheshire, Shropshire, and North Stafford; one for South Stafford; one for North and East Lancashire; one for St. Helens and Wigan district of Lancashire; one for So Helens and Wigan district of Lancashire; one for North Wales; one for the south-west of England and South-East Wales; one for Glamorganshire and South-West Wales; and two for Scotland.

COAL-PISH (Cadus carbonarius), a somewhat common Coll. First (cause carronaries), somewhat common fish, extensively distributed through the principal seas of Europe, being abundant in the Baltin, the Mediterranean, and the Northern seas; also found in large quantities on the coast of Great Britain. According o Mr. Couch, "It is in the highest condition from October to December, at which season it prowls after prey in large companies; so that, when met with, they prove a valuable capture to the fisherman ; for, though but coarse food, yet, being wholesome, substantial, and cheap, they are eagerly purchased by the poor, either fresh or salted. . I have known four men in two boats, two men in each boat, take over two tons weight boats, two men in each boat, take over two tons, weight of this fish in a very few hours. The season for spawning is early in spring; immediately after which the coal-fish becomes so lank as to be worthless, in which state it continues through the summer." It owes its singular appellation to the curious nature of its skin, which, upon being handled, soils the fingers in the same way as would result from touching coal. It is likewise known, during its progress from birth to maturity, by the names of cuddy, sythe, and sillock. The fishermen of Yorkshire, however, have given it two more aliases: when young, they call it purr, and the old fish are named lillets.

COAL FORMATION. (See CARBONIFEROUS SYSTEM.)
COAL TAR. (See TAR.)
COAL TRADE.—There is reason to believe that the existence and the use of coal in Britain were not un-known to the Romans. During the Saxon period, however, it seems to have been neglected. In 1239 Henry III. granted a license to the burgesses of Newcastle to dig for coal; and half a century later that town had become famous for its trade in this article. In 1306 the use of coal had become so general in London that the air was said to be infected with its noxious vapours, and its use was prohibited. In 1325 coals began to be exported to France, and in 1379 a duty of 6d. per ton was imposed upon ships coming from Newcastle with coals. In 1816 the coal trade at Newcastle appears to have employed four hundred sail; some of which went to France, others to the Netherlands. The which went to France, others of the Nethermans. In the coal trade of this country was long subjected to very heavy and oppressive duties. Formerly a duty of 6s. 5d. per ton upon large, and Is. 8d. per ton upon small coals, was levied upon all coal exported to foreign countries. In 1931 these duties were considerably modified, and in 1935 they were repealed, with the exception of an ad valueum duty of 10s, per cent. on exception of an ac caterine duty of 198, per cent. On coal exported in British vessels, and as per ton when exported in foreign ships. In 1840 these daties were altered to 108 ed. per cent, and 4s. 27d. per ton respectively. In 1842 duties of 2s, per ton on large and is, per ton on small coal and culm exported in Buttish vessels as in case of the comment of the comments. British vessels, or in vessels of foreign countries with which reciprocity treaties existed, were imposed, and 4s. per ton on such as were exported in other foreign vessels. The two former duties were abolished in 1845, but the last continued in force till 1850. In the

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# Coalition

reign of William III. stax of 5s. per chaldron (53 owt.) was laid upon all cost carried constwise from one part of the kingdom to another, and during the French war it was raised to 9s. 4d. In 1825 this tax was reduced to 0s., and in 1831 it was repealed. Though these duties are now abolished, the coal trade is still in some places burdened with heavy local duties. By 1 & 2 Will. IV. c. 76, several oppressive acts affecting the coal trade of the city of London were repealed, and the duties previously payable to the corporation of the city more coals were communed for a duty of of the city upon coals were commuted for a duty of is. Id. per ton, and by 8 & 9 Vict. c. 101, a like duty was imposed upon coal brought into London by railway, causi, or other inland carriage. Not less than 85,600,000 tons of coal are raised annually from the sarious mines of the United Kingdom, and even at that Tate it is estimated that the supply will last for 1,000 years. England furnishes nearly 48,000,000, Wales about 5,500,000, Scotland nearly 9,000,000, and Ireland only about 120,000. Of these the greater part is either used in the vicinity of the mines or sent by inland burgingation or land-carriage to different parts of the lingdom. The total quantity of couls, einders, and culm sent coastwise to different parts of the United Kingdom was, in 1858, 9,525,811 tons; in 1860, 10,720,716. The quantity exported from the various ports of the United Kingdom to foreign countries and British possessions, where the contract of the United Kingdom to foreign countries and British possessions, where the contract of the United Kingdom to foreign countries and British possessions, where the contract of the United Kingdom to foreign countries and British possessions. ssions abroad was, in 1858, 6,529,483 tons; in 1860, 7.321,832. The country that received the largest quantity was France, amounting, in 1859, to 1,391,009 tons. In 1860 the total quantity of coals brought coastwise an asso the total quantity of coals brought coastwise into the port of London was 3,573,377 tous; by inland navigation and land-carriage, 1,409,899. There is much reason to doubt the policy of permitting the export of coal to foreign countries free of duty. "Taking into account," says M'Culloch, "that coal is the mainspring or causa causans of our manufacturing pre-eminence, we have always regarded the repeal in 1845 of the duty of 4s. (?) a ton laid on it when exported, as being in all respects a most impolitic measure. The retention of respects a most impolitic measure. The retention of the duty would not have perceptibly affected the exportation of coal, at the same time that it would have yielded a considerable amount of revenue derived wholly from the foreigner." "There does not seem to ready from the toreigner. There does not seem to be any ground for doubting that supplies of English coal are, if not indispensable, of the greatest value and importance to France, and study other foreign states." "There cannot, in our view of the matter, be s doubt that it should be charged when exported with a duty of 5s., or rather 6s. or 7s. a ton. Such a duty would not be innocuous merely, but advantageous, and would probably produce above £2,000,000 a year."—Supplement to third edition of M'Culloch's Commercial Dictionary

COALITION, ko-al-ish un (Lat. coalesco, I grow together), denotes the conjunction of parts which had before been separated, into one whole. In the beginning of the French revolution, it came to be used by French anthony has been considered to the control of th by French authors by way of contempt for the confederation of the other powers against France, the word alliance probably appearing to them too digni-fied for the object. Since that time the word has come into common use; but there is generally some idea of reproach implied in it. Continental diplomatists make this distinction between alliance and coalition,-that the former is more general, while the latter is directed against a particular enemy for a paracular opposition is also frequently used in the sense of a union of several parties, or their leaders, against another party; but it still carries with it the idea of reproach.

Coast, koast (Lat. costa, Fr. cots), a sea-shore, or the country adjoining the edge of the sea. When they are bordered with small rocks nearly on a level with the surface of the water, coasts are very dangerous. The depth of water is usually in proportion to the height of the rocks on the coast; so that a high coast indicates deep water, and a low coast shallow water.

Constitute Trade, koast ing, is commercial inter-course carried on by sea between different ports of the same country. Different laws regulate this department of trade in different countries, and, gene-tally, the policy has been maintained of excluding foreigners from all participation in it. This policy

# Cobalt

was adopted in England in the reign of Elizabeth, or, perhaps, earlier, and was perfected by the navigation acts of 1651 and 1660. These were succeeded by a vast number of regulations at different times; and by the Customs Consolidation Act (16 & 17 Vict. c. 107), it was enacted that no goods or passengers should be carried coastwise from one part of the United King. dom to another except in British vessels. In the following year, however, this restriction was repealed, and the trade is now free to the vessels of all countries. The number of vessels employed in the coasting trade The number of vessels employed in the coasting trade of the United Kingdom during the year 1868 were, entered, 142,528 vessels, of 18,490,546 tons, British, and 620 vessels and 107,571 tons, foreign vessels; and cleared, 143,146 vessels, of 18,593,120 tons, British, and 146,245 vessels, of 18,577,691 tons, foreign vessels.—

Ref. M'Culloch's Commercial Dictionary, last edition.

COAT OF ARMS. (See Heralder.)

COAT OF MAIL. (See MAIL, COATOF.)

COBALT, ko'-baudt (Germ. koboids, from koboides, the name of cortain mischivagus demons who were

the name of certain mischievous demons who were supposed to haunt mines, and to manufacture those ores which looked rich to the eye, but were really of little value. Among these were supposed to be the ores of this metal, and hence its name), Symbol Co, equivalent 29°5, spec. grav. 8°5.—Cobalt is a metal very similar to nickel in its physical and chemical properties. It generally occurs in the same ore as nickel, and the separation of the two metals is a task requiring and the separation of the two metals is a task requiring great patience and expertuess. Cobat is obtained as a metal either by reducing the exide by hydrogen, or by calcining the exalate. In the metallic state, it closely resembles steel. It fuses with great difficulty, and exidizes at a high temperature. It remains unstrend in moist air, dissolves slowly in sulphuric and hydrochloric acid, but readily in nitric acid. It is reddish-grey in colour, and is said to be magnetic. It is obtained principally from two ores,—Speiss coball and coball glauce. The compounds of cobalt are remarkable for their beauty of colour. The two colours may be the two colours and colour the two colours. and cobalt glance. The compounds of cobalt are re-markable for their beauty of colour. The two colours zoffre and smalt are compounds of cobalt. Zaffre is an impure oxide of this metal, made by calcining the crushed ore in a reverberatory furnace. The sulphur and arsenic are thus reasted off, and the impure oxide remaining is ground to an impulpable powder with two or three parts of fine and. Zafire is used largely in the manufacture of stained glass and in the ornamentathe manifecture of stained glass and in the ornamenta-tion of pottery. Smalt is a finely-powdered blue glass coloured with cobalt. Cobalt are is partially reasted, and combined with an equal quantity of carbonate of potash and twice its weight of well-ground quartz. The whole is melted in suitable pots in a furnace, silicate of potash being formed, in which the oxide of co-balt melts, the offer impurities falling to the bottom. The clear bine glass is ladded out, poured into water, and ground, when cool, into an impalpable powder. Smalt is used by paper-stainers. With oxygen, cobalt forms a protoxide and a sesquioxide. The anhydrous protoxide is obtained by calcining the hydrate or car-bourts. It is a black parader which the head size and bonate. It is a black powder, which, when bested in the sir, changes into an intermediate oxide, Co.O.. Oxide of cobalt gives to glass a very intense blue, which resists the action of as a very high temperature. Dissolved in ammonia, it gives a fine red liquid. Fused with potash, a brilliant blue compound is obtained. With magnesis, alumins, and exide of zinc, it produces, when fused at a high temperature, pink, blue, and green compounds. The last two are used as pigments. The hydrated oxide is a pink precipitate thrown down by adding a solution of potash to the solution of a cobalt salt. Protoxide of cobalt forms salts with the acids, which are light the air, changes into an intermediate oxide, Co.O. of could forms salts with the acids, which are light blue when hydrated, but turn red when the water is driven off by heat. Protonitrate of could is obtained driven off by heat. Protonitrate of cobait is obtained by dissolving the oxide or the metal in nitric acid. It crystallizes in small deliquescent crystals containing six equivalents of water. A solution of this salt is six equivalents of water. A solution of this saft is often employed as a sympathetic ink, being light blue, when cold, but bright red when the water of hydration is driven off by a gentle heat. The sulphaft of cobnit is generally employed as the source of safts of this metal. The esquioxide of cobalt is a brownish powder obtained by passing chlorine through a dilute solution of potash, in which the protoxide is mechanically suspended. Its salts are at present nuknown. Chloride

# Cobalt Ores

of coost is prepared by dissolving the oxide in hydro-chloric acid: the pink solution resulting yields, on evaporation, rose-coloured octahedrs of the hydrated chloride. The other saits of cobalt are uninteresting.

A solution of the nitrate is used in blowpipe analysis. A small quantity of the substance to be examined is to be moistened with the solution, and heated in the blowpipe finne: a pink colour indicates magnesia, and en and blue, zinc and alumina respectively. Fremy agreen and blue, zinc and alumina respectively. Frein, has formed some interesting compounds by combining the escutionide of cobalt with four, five, and six equivalents of ammonia, forming brown, red, and yether sales. These double bases he names fuscobaltia, researchaltia, and luteocobaltia. Thémard's blue is a low saits. These double bases he names fuscobaltia, resecobaltia, and lutescobaltia. Thenard's blue is a beautiful pale-blue pigment, consisting of a mixture of phosphate of cobalt and phosphate of alumina.

COBALT ORBS. - The principal ores of cobalt are, white colatt Osss.—Ine principal ores or cooms are, waite solutions, which is the most common (it contains coluit associated with arsenic, iron, and sulphur); grey cobalt ore, containing arsenic, iron, cobalt, and silica; and glance colat, which is a double bisulphide of arsenic and cobalt. All the ores of cobalt contain more or less

COBALTICYANOGEN. (See CYANOGEN.)
COBALTINE, ko-bawlt'-een, in Min., an arsenical ore of cobalt, also containing sulphur. It occurs in reddish silver-white trapezohedral crystals, at the mines of Webna, in Sweden. It contains from 33 to 37 per cent. of metal.

COBRA DI CAPELLO. (See HOODED SNAKE.)

COCA. (See ENTHROXYLON.)
COCCAINN, kok-set-gins, was a theological school which arose towards the middle of the 17th century, and took its name from its founder, John Cocceius, professor of divinity in the university of Leyden. He regarded the history of the Old Testament as a mirror which held forth an accurate view of the transactions and events that were to happen in the Church under the dispensation of the New Testament, and unto the end of the world. The greater part of the ancient prophecies, he maintained, were to be received in a literal manner, and by the very sense of the words used in these predictions. In fact, his whole system was an attempt to Judaize Christianity. He was a man of considerable learning, and he has most fully expounded his views in his "Summa Doctrine de Fædere et Testamento," Leyden, 1649. His great opponents were Desmarets and Voetius. His views found for a time many supporters in Holland and other parts.

COCCILOBA, kok-ko-lo'-bu (Gr. kokkos, a berry ; lobos, a lobe), in Bot., a gen. of plants belonging to the nat. ord. Polygonaceæ. From the leaves, wood, and bark of C. unifera, a very astringent extract, commonly known as Jamaica kino, is obtained. The fruit called the seaside grape is edible, and has an agreeable seid

flavour.

navour. COCCOSTEUS, kok-kos'-te-us (Gr. kokkos, berry; osteon, bone), in Geol., a fish of the Old Red Sandstone, so named from the small berry-like tubercles with which the plates of its crauial buckler and body are thickly studded. The remains found in the Caithness flagstones show that its length was from a few inches to about

COCCULUS INDICUS, kok'-u-lus in'-di-kus (Lat., Indian berry), is the fruit of the Anaminta paniculata (which see). It has some resemblance to the bay-berry, and is imported into this country from the Eastern archipelago. In 1850 no fewer than 2,359 bags of one huntrindwich each ware precised. Cocculus indians in dredweight each were received. Cocculus indicus is chiefly used for adulterating cheap beer; and it is really wonderful in how many ways it is fitted to disguise a liquor prepared from insufficient quantities of malt and hops; thus, it impurts to the sophisticated liquor an intensely bitter taste, a darkness of colour, and a fulness of body, while it adds to its inchristing qualities. It is scarcely necessary to state that the occulus is never employed by respectable brewers. Its use has been forbidden by act of parliament under a penulty of £200 to the brewer, and one of £500 to the druggist of 2200 to the prewer, and one of 2500 to the druggest who sells it to a brewer. In large doses it is poisonous to all suimals, and it has long been used by poschers for stupifying fish and game. In medicine it has been employed as an external reflectly for certain skin diseases. It owes its active properties to a very poisonous crystal-ling alkaloid called picrotoxine. The names Levant mut Cock

and Bucca orientalis are sometimes applied to this

COCHINEAL, kotech'-in-eel (Sp. cochinilla).-beautiful dye is obtained from the Cocess cuce, a beautiful dye is obtained from the Louiss of the insect intesting a tribe of carti growing in Honduras and other parts of South America (see also Carmera). and other parts of bound america (see also Carmaines). The femals insects, which are wingless, are also so delected, and the different degrees of value attached to them depend on the methods employed to kill and dry the insects. Analyses of cochineal have yielded chiting. fatty matter, phosphates of lime and petash, and the colouring matter carmine. Cochinest, in conjunction with chloride of tin, forms the "tin spirits" of the dyer. The coclineal insect is also cultivated in Mexico, Teneriffe, Java, and the West Indies. Efforts have been made, with more or less success, to introduce it into Van Diemen's Land, the Cape of Good Hope, Algeria. and Spain.

and spain.

Cochierer, kok-le-air'-e-ā (Lat. cochleore, a spoon),
in Bot., a gen. of plants, so named from the leaves being
spoon-shaped, belonging to the nat. ord. Crucifers. The
species C. officinalis is the common scurry-grass, an indigenous annual found in muddy places near the sea-shore. It has white flowers, which blossom in April and May. When rubbed, it evolves a pungent odour, and its taste is acrid and penetrating. It has long been esteemed for its aniscorbutic properties, and was formerly admitted into the Dublin Pharmacopois.

merly admitted into the Dublin Pharmacoposis.

Cock, Domestic, kok (Sax. coc, Fr. coq), (Fallow domesticus).—At what period of the world's history this valuable bird was brought under the control of man, it is almost impossible to determine. Without doubt, they were well known over many parts of Europe and Asia many hundred years before the Christian era. Pliny, in speaking of it, says.—"After the peacock, the birds which are most sensible to-clary are those active sentingle which are most sensible to glory are those active sentinels which nature has produced to rouse us from our matin slumbers and send us to our daily occupations. They are acquainted with the stars, and every three hours they indicate by their crowing the different periods of the day. The gatt of the cock is proud and commanding; he walks with head erect and elevated crest. Alone of all birds he habitually looks up to the sky, raising at the same time his curved and scythe-formed tail, and isspiring terror in the lion himself, the most intrepid of heasts." A mode of divination was practised by the ancient Greeks with these birds. The letters of the alphabet were written in a circle, and a grain of wheat and barley laid on each letter. Then a cock, consecrated for the occasion, was led within the circle. The required informstion was obtained by putting together those letters of which the cock picked the grains. This mode, however, was abandoned on the discovery that it was not an uncommon thing for the priests to have, as well as the genuine grains, imitations in war; so that by proper management the bird could be made to uncover those letters that best accorded with their views. It has been asserted that our original breeds of do-mestic poultry were derived from Persia. This, bow-ever, takes root in the fact of Aristophanes allading to the cock as the "Persian" bird. This is, in to the cock as the "Persian" bird. This is, in all probability, but a hinting at the fact that during the intercourse of the Greeks with the Persians, they the intercourse of the Greeks with the Fersians, they obtained from them a breed of fowls partly or thoroughly domesticated. Although poultry has been known to exist in Fersia from a very remote antiquity, the most patient research has failed to discover any birds of the genus Gallus in that country. According to Temminck, our domestic cock is derived from the Jago cocks (Gallus giganteus), a large and wild species inhabiting the island of Surnatra, and from the species Bankiva, another primitive bird found in the Javan forests. Nor is this argument without substantial basis; for the size of our common cock is intermediate between the Jago and the Bankiva, and in the nature of the feathers and the distribution of the barbs the resemblance is perfect; moreover, in the two wild species mentioned, the females are provided with a crest and small barbles,—characters which are not found in any other known primitive races. The domestic cock has his head surmounted by a notebed crimson fleshy substance, called a comb; and under the threat hang two other pendulous fleshy bodies, called wattles. In both sexes there is below the est

# Cockede

an eblong spot, the interior of which is reddish and the remander white. The feathers arise in pairs from each sheath, touching by their points within the skin, saon aneath, touching by their points within the skin, but diverging in their course outwards. On the neck the feathers are long and marrow; on the rump they are of the same form, but droop laterally over the extremity of the wings, which are quite short, and terminate at the origin of the tail, the plumes of which are vertical. In the centre of the cock's tail are two long feathers, which fall back in a graceful arch. When the cock reaches the age of six months, he attains marries and his wowere remain undiminished till he is tarity, and his powers remain undiminished till he is tires years old. Then, if younger male birds be about, he will find himself alighted by his numerous wives, and be compelled to yield to a rival the empire of the yard. Descripting is one of the most widely-spread sports in the world. Captain Cook fighting is one of the most widely-spread sports in the world. Captain Cook found it commonly practised among the South-Sea Islanders, and Mr. Ellis describes it as one of the most ancient games among the Ekhtisians. Long before a ship touched the shores are the surface and industrial to the inhabit. of Polynesia, cock-lighting was known to the inhabitants. Amongst them, however, the rules that distinguish the "civilized" cockpit are not practised. Its, or, happily, was, our custom to clip the combatants of every superfluous feather; the Polynesians, on the contrary, delight to pit them with the full complement of plumage adorning them. In another respect, too, these savage cock-fighters showed themselves more humane than us: they never armed the heels of their birds with spurs; and as soon as one bird was observed to wood his antagonist, he was said to be vi (besten), and at once taken away. The common jungle-fowl of continental India (Gallus Sonneratii) is a very favourite continental India (Gattus conneration) is a very instance. If the Mussulman natives of India. (See Cook-righting.) Considering their insignificant means of defence, the courage exhibited by the domestic cook is very singular. Bishop Stanley, in his mestic cock is very singular. Bishop Stanley, in his British Birds," says, "We knew an instance where a barn-door cock became the terror of his little domain. Accustomed to be fed by his owner, a clergyman, he shortly began to express his disappointment by very determined attacks, if his master happened to pass him without the accustomed offcring. On one occasion he actually struck a piece out of a strong kerseymere gaiter, and repeated the attack in spite of some severe kicks it was found necessary to inflict in self-defence. Nothing departed though occasionally histed defence. defence. Nothing daunted, though occasionally kicked several yards like a football, he would still come on as fiercely as ever for three or four times. His reasoning, too, appeared to be on a par with his courage, for he soon discovered that women were protected by the

soon discovered that women were protected by the lower part of their dress, and, accordingly, instead of flying at their legs and feet, he invariably flew at their heads, fixing himself on their shoulders. Cockans, kok-aid! (Fr. cocarde, a corruption of coquarde, a tuit of feathers), is applied to a mark of distinction wom on the hat, usually a riband or a knot of ribands, properly by officers of the army or navy, or their gervants, but frequently assumed by others. It is disconstinues the budge of political party.

Cockarde, kok-a-tooz'.—These birds are confined to the Eastern Archipelago and Australia; in the latter country they are very abundant. Like others

latter country they are very abundant. Like others of their congeners, they make their nests in decayed of their congeners, they make their nests in decayed trees; indeed, if the tree should not be very much decayed, it makes little difference to the cockatoo, who can speedly dig for himself a hole in the trunk with his iron-like bill. They are easily tamed, and learn to imitate the human voice in some respects, although with little accuracy. A capital account of cockatoo-hunting by the natives is related by Captain Grey:—"Perhaps as fine a sight as can be seen in the whole circle of native sports is the killing of cockatoos with the their or homerous. A native processes a large with the kiley, or boomerang. A native perceives a large light of cockstoos in a forest which encircles a lagoon; at in the leafy summits of the trees sit a countless miniber of cockstoos, screaming and flying from tree to treess they make their arrangements for a night's sound Tree as they make their arrangements for a night's sound genus, discovered within the specimen was sent to Mr. Le may not have even, this slight covering to impede his in named. It is about fiftee motions, draws his kiley from his belt, and, with a noiseless elastic step, approaches the lagoon, creeping from tree to tree, from bush to bush, and disturbing the birds as little as possible. Their sentincls, however, take the slarm; the cockatops farthest from the

### Cockboat

water fly to the tree near its edge, and thus they keep concentrating their forces as the native advances. They are aware that danger is at hand, but are igaorant of its nature. At length, the pursuer almost resches the edge of the water, and the scared cockatoos, with wild cries, spring into the air. At the same instant, the native raises his right hand high over his shoulder, and bounding forward with his utmost speed for a few pages, to give impetus to his blow, the filter for a few paces, to give impetus to his blow, the kiley quits his hand as if it would strike the water; but hen it has almost touched the unrufiled surface of the lake, it spins upwards with unconceivable velocity and with the strangest contortions. In vain the terrified with the strangest contortions. In vain the terrined cockatoos try to avoid it: it sweeps wildly and uncertainly through the air; and so eccentric are its motions that it requires but a slight stretch of the imagination to fancy it endowed with life, and, with fell swoop, is in rapid pursuit of the devoted birds, some of which are



LEMON-CRESTED COCKATOO.

almost certain to be brought screaming to the earth But the wily savage has not yet done with them. Ho avails himself of the extraordinary attachment which these birds have for one another, and fastening a wounded one to a tree, so that its cries may induce its companions to return, he watches his opportunity. its companions to return, he watches his opportunity, by throwing his kiley or spear, to add sucther bird or two to the booty he has already obtained." Of this bird there are several species; as follows:—Broad, or Rose-crested Cockatoo (Psittacus cristatus).—This is the largest of the cockatoos, being about two feet in length. It is distinguished from the other species, and the state of the cockatoos to the other species. which not only by its size, but also by its creat, is arched over the head, and of a bright orangered colour beneath. The general colour of this bird is white, with a pink tinge. It is sometimes domesti-cated, and learn to mimic the voices of various ani-mals with which it is domiciled or in the vicinity of which it is placed. It will mey like a cat, bark like a dog, or imitate, with marvellous correctness, the crowing of a cock,—Great Sulphur-crested Cockatoo (Psittacus galeritus),—This species is at the same time the handsomest and most common of the family. Its plumage is white, tinged with yellow on the tail and orange or lemon-colour on its crest, which is pointed, and about seven or eight inches in length. In Aus. tralia, these birds abound in large flocks of thousands They commit frightful havoc in the cornin number. fields, and the sight of this handsome bird is sufficient to create the utmost dismay in the mind of the agri-culturist, who knows too well the affinity betwixt ripe corn and the lemon-crested cockatoo.—Lesser Sulphurcrested Cockatoo (Prittacus sulphureus) .- Greatly resembling the preceding, only some few inches smaller. It is a native of the Moluceas; but of its habits little or nothing is known. It is very pretty, diffectionate, and good-tempered, a rare combination of excellent qualities. There is another species of the Cockston quantes. Inere is another species of the Cookaton genus, discovered within the last thirty years. A specimen was sent to Mr. Leadbeater, after whom it is named. It is about fifteen inches in length, of a white colour, tinged with pink. This species is exceedingly rare and greatly prized.

COCKBOAT, kok'-bote (Arg.-Bax.), a small boat used on rivers or near the shore, which is both too weak and too small for sea service.

Cockchafer

Coccon

COCKCHAPES, kok'-chai-fer (Ang.-Saz.), (Melolontha vulgaris), a well-known species of beetle, belonging to the Lomellicornia. At is very common throughout the greater purt of Europe, and in this country is particularly abundant. In its larvastate it lives for nearly four years, and fields, very voraciously, on corn, &c. The perfect insect has an exceedingly short existence, sometimes living only a week, and occasionally so long as a month, after arriving at maturity. At this stage it feeds on the leaves of various trees. The sycamore, the lime, the beech, and willow are most in requisition: these trees are sometimes completely loaded with cockchafers. In its depredations it more nearly resembles the locust than any other insect; and, at certain times, commits frightful ravages in agricultural districts. A remarkable instance of this occurred in Ireland about the year 1688. On this occasion, it is said, they hung in dusters on the trees and hedges, like bees swarming: the noise of their countless jaws at work was heard by every traveller, and was compared to that of the sawing of timber.

COCK-CROWING .--The vulgar belief that spirits are permitted to roam about the world in the night, and obliged to disappear at cock-crow, is very ancient, and oniged to disappear at cox-crow, is very ancient, and is mentioned by the Christian poet Pradentius, who flourished in the beginning of the 4th century, as being a common belief among the early Christians. The belief has not yet altogether died out; and Bourne tells us, that in the country villages, where the people require to go early to labour, they always go cheerfully at cook-crow; but if called abroad sooner, they are apt to imagine everything they see or hear to be a

wandering ghost.

COCKER, ACCORDING TO, kok'-ker, a phrase some-times applied to what is strictly correct, or according to rule. It is derived from a celebrated arithmetician of that name, who flourished in the 17th century, and was the author of a well-known work on arithmetic.

COCK-PIGHTING is said to have been a common pas time in Athens and other parts of Greece, and it seems to have been afterwards adopted from that country by the Romans. It is probable that cock-fighting was the komans. It is promine that cock-igning was first introduced into this country by the Romans, though the bird itself was here before their arrival. In the reign of Henry II. it was a sport of the school-boys on Shrove-Tuesday, and called Carnilevaria; but we have no earlier account of it. The same practice prevailed in many schools in Scotland to within the fast century. It became a great national sport; and last century. It became a great hardonal sport; and though more than once prohibited, it received encouragement and countenance from several of the crowned heads. The celebrated national cockpit at Westminster is said to have been erected by Henry VIII., and James I. and Charles II. were both encouragers of the sport. It was forbidden by one of encouragers of the sport. It was forbusen by one of the acts of Gromwell. At present, cock-fighting is prohibited by 12 & 13 Vict. c. 92, and a penalty of £5 may be levied on any person keeping fighting-cocks, letting a cockpit, &c., for every day that he shall so act; but it is still largely carried on, particularly in the colliery districts in the north of England. Cocks for fighting are selected with the greatest judgment, and trained with the utmost care. For the combat, they are care-fully trimmed and armed with steel or silver spurs. The place appropriated to fighting is called the pit, and the buttle is conducted by two setters, who place the cocks beak to beak. When once pitted, neither of the setters can tonch his cock so long as they continue to fight, unless their wespons get entangled. In what is called the "Welsh main," a number of cocks are pitted against each other, and then the conquerors pitted against each other, until only one remains alive. (For those that wish further information on this subject, we

unoso that wish further information on this subject, we may refer to Blaine's Encyclopædia of Rural Sports.)
COOKLE, kok'-l (Cardium), a gen. of Mollusca, belonging to the Cardiaceæ. There are numerous species of this animal, some two hundred of which are known. The common cockle is the most abundant, and large quantities of this shell-fish are found on the country of Casest Bullian subjects. and large quantities of this shell-has are found on the coasts of Great Britain, principally on muddy and sandy banks. By some it is considered a highly nutritions article of food; and, Indeed, the enormous demand for it would seem to justify such an opinion. The structure of the cockle is somewhat curious; it has two adductor muscles, which serve the animal to 523

draw the valves of the shell together. Its foot is very large, compared with the circ of the snimal, and beat in the middle. This member is not only used for the purpose of progression, but also for executing heles in the mud and sand in which it lives. By suddenly at raight and sand in which it lives. By success, straightening the foot, the cookle moves with a jump. As the foot is smaller than the shell, it may appear a little singular how it is enabled to bore a hole sufficiently large to admit the whole animal. This is accommended to the sufficiently large to admit the whole animal. This is accomplished by distending the foot with water, and then, by a rotary motion, the seemingly impossible feat easily achieved.

COCKNEY, kok'-ne, is a nickname, or term bf con-tempt, applied to a Londoner, and has been long in use, occurring in verse as early as the reign of Henry II Its origin is doubtful. According to some, it is derived from coquina, a kitchen, and denoted the luxuriousness for which London was celebrated even in early times; or from Cokeigne, or Cocagne (probably from the same root), the name of a Utopian country of luxury and ease. According to some, it denotes one coaxed or cockered, made a fool or nestle-cock of; secording to others, one utterly ignorant of rural affairs or hus-bandry. The latter probably originated in the wellhandry. The inter property who, when on a visit to the country, being told that the horse neight, afterwards spoke of the cock neighing, hence cocknets, cockney. The modern mark of cockneysm is an abuse wards spoke of the cook neighbor, account, and the cooking is an abuse of the letters h and r; as, hair for air, sofar for sofa. The Cooking school of literature was a term applied in the earlier numbers of "Blackwood's Magazine" to Leigh Hunt, Hazlitt, Keats, and other young authors. The King of the Cookings was an important personage in the sports and shows formerly held in the Middle Temple on Childermas-day, and had his mar-shal, butler, constable, and other officers, who were ordered to be entertained with due service in "honest manner and good order.

COCKPIT, kok' pit (Ang.-Sax.), in a ship of war, is a cabin situated near the apartments of the surgeon and his assistants, where all the men wounded in action are

conveyed to have their wounds dressed.

COCKROACH. (See BLACKBRETLE.) COCOA, or CACAO. (See THEOBROMA.)

COCOA, Or COCOA-NUT. (See COCOS.)

COCOA-NUT FIBER, ko'-ko.—The seeds of the socoanut palm (Cocos nucifera), well known under the name of cocoa-nuts, are contained in a large hust composed of solid woody fibres. These fibres were woven into fabrics of various sorts by the natives of Cevlon and India from time immemorial: but it is only within the last fifteen years that this material has only within the last fifteen years that this material has been used in Eugland. Cocca-nut fibre is now applied most successfully to the manufacture of mats, matting, cordage, brushes, brooms, &c. &c. &c. Latterly a method of introducing colour into the manufacture has been devised by dyeing the fibre; and some very fine combinations of colours have been formed, which contrast successfully with similar manufactures in the finest harm. Coreanut fibre has formed, which contrast successfully with similar manufactures in the finest hemp. Cocoa-nut fibre has been used for bedding with great advantage. It does not become knotty or hard, does not harbour vermin, and is not affected by variation of climate. The refuse of the husk forms a perfect material for fern-beds, being much less liable to give out an offensive odour than spent tan, which is often used for this purpose. Cocoa nut libre is also called soir, and has long been used for ropes and cordage under this name.

Cocoon, kok-own (Fr. cocon), the silky tissue or envelope which the larve of many insects spin, as a covering for themselves immediately before passing into the pupa form. The name is also given to coverings made of other materials. Some caterpillars work into the silky anythous the hairs which cover their into the siky envelope the hairs which over their bodies; others imbed in the network a leaf, or several leaves fastened together. The larvas of some insecta broduce the silken substance of which the cocoons are formed in much greater quantity than others. the most useful producers is the ordinary silkworm, whose cocoon is a close and compact oval ball, surrounded with a gauze-like glossy covering. It consists of one long continuous thread, sometimes a thousand feet long. Some parts of the thread are weaker than feet long. Some parts of the thread are weaker than others; but the greater portion can be unwound as easily as a ball of cetton thread. Different insects

milk) are important articles of food in many mauy tropical regions.

The cocoa-nut is

also largely con-sumed in this country. From

country. From the albumen, or

edible portion, the concrete oil

known as cocoa-nut oil, or cocoa-

nut butter, is ob-

tained. (SeeOrLs.) It is now exten

sively employed

us a candle mate-

rial and for making soap, being imported in enor-

Coccs

vary in the time occapied in animing their occouns: several days are spens by the silkworm in this task. In covering the pape, many insects preceed with an aimset mathematical injusty with regard to the direction and disposition of their threads.

Cocos, to less (Gr. kokkes, a kernel), in Bot., a gen of Palma C, and free, the cocos or cocoa nut palm, a perture the most useful member of that great family, in pertuage the most userin member of this great among which may be said to yield flour, sugar, oil, wax, wine, thread, attending timber for habitations, and leaves for thatching. The cocca-nut palm itself furnishes our tropical arretiren with most of their necessaries, and the said from the inice Sugar castled aggery, is largely obtained from the juice which dows out when its spathes and spadix are injured. Today and arrack are produced by the fermionation of this juice. The albumen of the seeds (2000s-suts) and the liquid within this (cocon-nut

mous quantities by Price's Candle Company. (See COCOA-NUT PALM. PACTURE.) .In India it is much esteemed as a pomatum for strengthening the hair; but its unpleasant odour, and its hability to become raudid, prevent its use in this country for such a purpose. From the fibrous portion of the pericarp of the cocca-nut, the strong fibres called corr, or cocon-nut fibres, are obtained. They are remarkable for their strength and durability, and are much used for cordage, fishing-nets, matting, scrub-bing-brushes, and similar manufactured products. The

sing-breames, and similar manutactured products. Inc.

mood of the cocca-nut palm is very hard, handsome,
and durable, and is applied to many useful purposes.

It is commonly called porcupine-wood.

Com, ked (Ang.-Sax.).—This fish is, perhaps, the
most important to the human family of all the
imbabitants of the deep. It affords labour and
food to the usual of men, and is one of the most splendid national resources,—one which, owing to the wonderful provision of nature with regard to the fecundity of this fish, is not likely to diminish for a someiderable period. For more than four certuries considerable period. For more than four centuries has the cod-fishery been carried on, without any interruption; yet the supply at the present day is something enormous. A single fisherman has been known to capture 500 of this fish in a day of ten bours. Now, explare-600 of this as in a day of ter hours. It was the of frequently attains a weight of 50 lbs., this had of the fisherman, even setting it down at a mode-rate rate, must have amounted to something like 20,000 lbs. of fish; and multiply this by several thousands, and we get the amount of cod which is daily desirated desirated has soon. The creat summly of cod obtained during the season. The great supply of codes from the banks of Newfoundland; but the codfisheries near the coasts of Scotland, Sweden, and Iceland, are by no means insignificant. The principal place in which it is found on our coasts are thus slined to by Mr. Yarrell:—"A change has taken place, from the cod having shifted their ground. Bornerly the Gravesend and Barking fishermen obtained few cod mearer than the Orkneys or the Dogger Bank; but, for the last two or three years, the supply for the London market has been obtained by going so farther than the Lincolnshire and Norfolk coasts, as even between that and London, where previously Clode

very few fish could be obtained." There are about 6,000 vessels employed in the cod-fishery, in addition to a large quantity of small boats. All the cod are caught targe quantity of small house. All the con are caught by hooks and lines; the bait used commonly consists of impets, whelks, and pieces of various lishes. Our wonder at the extraordinary supply of this fish is considerably diminished when we examine the roc of the cod. By those who have taken the trouble to satisfy themselves, it has been calculated that when one de-vours a cod's roe, he also devours no less than about 180,000,000 lbs. of food, supposing it were allowed to arrive at maturity. One's brain roels at the bars idea of reckoning what might be the condition of cod-dom of reckoning what might be the condition of wood-dom if these fishes were left alone for a few person. The soci is a very veracious fish, a good instance of which is related by Yarrell. "Mr. Crouch," says he, "has taken thirty-five crabs, none less than the size of a half-crown piece, from the stomach of a cod." It is not particular in its diet, but devours indiscriminately all the small

fish iŧ can The catch. modus operandi of the fishermen is thus described: -"For the deepsoafishing very long lines are used; - these are fixed to the bottom by means of



small anchor, the other end being supported by a buoy, and the hooks are placed at the extremities of short lines, usually about six feet in length, attached at intervals to the main line. The long lines are usually left for about six hours, or for a whole tide, when they are taken up and examined. In the interval the ishermen are not idle; they carry on the work of destruction by means of hand-lines, of which cach mnn manages a nim."—Dallas's animal Kingdom. ~

Copa, ko'-da (Ital.), literally, a close or termination.

an Italian word applied to a certain number of bars-which form the final close of a composition.

CODARIUM, ko-dd'-re-um (Gr. kodurion, a leathern pouch), in Bot, a gen. of plants belonging to the nat. ord. Leguminous, sub-ord. Censlpinies. C. acutifolium and obtusifolium, both natives of Sierra Leone, yield fruits known as the brown and the velvet tamarinds. The pulp of each kind is caten, and has an agreeable

CODE, koad (from Lat. codex, a manuscript), in Juris., is applied to a compilation of laws made by public au-thority. Several collections of the Roman law are designated by the name, the chief of which are, the Gregorian and Hermogenian codes, made by two colebrated jurisconsults, Gregorius and Hermogenes, and containing the constitutions of the emperors from Hadrian to Constanting: the Theodosian code, published in 428 by command of the emperor Theodosias II.; and the Justinian code, prepared by command of the emperor Justinian, and first published in 529, and a second time after revision, in 534. There are several of the modern systematic collections of laws designated by the title of code, the chief of which are the code of Frederick the Great of Prussia; that of Catherine of Russia (confined to criminal jurisprudence); that of Joseph II. of Austria; and the celebrated Code Name them in France. In France, before 1789, there was no uniform system of legislation; in some parts the Reman law prevailed, in others ancient custom, both being supplemented by royal ordinances. These having bei abrogated at the revolution, several attempts were made to form a code of laws in accordance with their ultered circumstances; but, on secount of the unsettled america circumstances; but, on account of the unsettled state of society at that period, nothing of a satisfactory nature was effected. At length Napoleon, after he be-came first consul, appointed certain commissioners to draw up a project of a civil code, which was printed in the early part of 1801, and copies thereof transmitted to the different courts of france for their observations. and suggestions. The whole was then laid before the legislative section of the council of state, and the rious points successively discussed, Napoleon himself

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Codex

taking an active part in the debates. After being cub-intted to the tribunate, it was at length premaigated as the civil law of France in 1804. When Napoleon was reased to the empire, the tate Code sivil des Fran-cais was charged to Code Napoleon. In 1816 the former this was restored, and in 1852 the title Code Napoleon was again given to it. This code, which regulates the civil rights of the people, as regards person and property, in its general arrangement and distribution resembles the Institutions of Justinian. It is divided into three books, the first of which treats of the civil volutions of books, the first of which treats of the civil relations of Dooks, the next of which react of the fivil relations of individuals, the second of property in twa next kinds and modifications, and the third of the various modes in which property is legally acquired. Besides the Code coil, the French written law comprises five other codes. The Code de Providure cuide relates to the forms of pro cess and the modes of procedure before the various givil courts—The Code ne Commerce as its name in it civit courts—The Code de Commerce as its name in in cases, bear upon commerce al transactions. It consists of four books, the first of which treats of commerces general, of the various classes of commercial men, of partnerships, &c. the accord of maritime commerces, the third of bankripties, and the fourth of commer-cial knownia.—Code d'Instruction criminelle regulates the farms of procedure in crimical cases—The (ode penal defines the various kinds of crimes, and their several punishments. This and the preceding were promulgated in 1810, but important changes have been made upon them by subsequent enactments, particu isrly in 1832 —The sixth and last of these is the Code foresties, which was pullished in 1927, and relates to the administration of the woods and forests

Conex, ko der (Lat ), origin ally denoted the trunk of a tree, and was after wards applied to the wooden tablets covered with wax whi h weis used by the ancients for covered with war win h were used by the ancients for writing. It atterwirds came to be applied to a book or manuscript generally and under the emperors, and subsequently, it designated collections of civil and acclesiastical laws (over Copr). In modern I aim it denotes a manuscript folume, as, Codex Mexandrinus Codex, Vaticanus, or raim MS copies of the sacred softptures—Codex recruptus (a re written codex) or Dalmonesclus, is an aum in parthement or which the palimprestus, is an anna in parchment on which the original writing has been defaced, and a different com-

position copu d

Contest, kod's sel (Lat collection), is a supplement to a will, where anything is omitted which the testator would add, or which he will explain, alter, or re-tract, and it is the same with a tistament, and taken as part thereof, and it must be executed in the same manner as a will, and it must be executed in the same manner as a will, and is a situated by two witnesses at itsast, who must be present when the test for signs or asknowledges it and they must sign their names, as witnesses thereto, in his presence and in the presence of each other

CORNORNA, Lo horne', sma'l morture that were for merly used for throwing groundes, a kind of shell on a small scale. They were named after their inventor, Cochorn, a celebrated military engineer

CELENTERATA sel mintary enginer CELENTERATA sel n ter as ta (Gr kölles, hellow, feres, an anomaly), na Zool, one of the two sub king dome into which the Radiata of Cuver have recently been dauded. It corresponds to the class Polyps of former writers, and includes most of those currous stationary agreements. tionary creatures which are introduced into marine aquatis, as the sea ancinones and sertularia (See

tionary creatures which are introduced into marine aquatits, as the see autimones and sertularia (for Agrical Kingdom)

Oudoutling se lo kline, in Bot, a gen of plants belonging to the unit crd. Anonaceae The species C pelipsarpa is the helberine, or vellow dre tree of worden. Its bark yields a beautiful yellow colour, which much used for dyeing in certain parts of Africa Whea reduced to a crarse powder, this bark is a valuable topical remedy in the treatment of ulcers it contains the alkaloud bet bernne, to which its medicinal virtues are urobably due

It contains the alkaloid betterine, to which its medicinal virtuge are probably due to the contains the same punciples at the seed, and therefore has analogous properties. Besides the real C archive, some of the better plant, or quiton of the Arabs, the seeds of delenes, grown in Appaul, C measurements, in the which, when reasted and ground, are used to prepare the saily and most cheriable drink of probably more the saily and most cheriable drink of probably more than a hundred militions of human beings. The plant is said to be a native of Arabia Felix and Scuthern Sax daman, to stop 30), a case or water-tight structure fixed in the bod of a river or other water, for the former region at has been to contain the seed, and therefore has analogous properties. Besides the real C archive, as me puniciples as the seed, and therefore has analogous properties. Besides the seeds of the seeds

Collectors

carried to various sountries within the trouter, with at the present time, it is sultivated wherever the eliments is suitable. In some countries it saldens attains a greater height than eight or ten feet; but is others, its average height, when full grown, as from fifteen to twenty less it is every suitable, and every form the condition and every form the condition and its respectation.

and evergreen to lage. It is raised from the esset nurreries, and is transplanted when about six month old. In three years it comes into full bearing, and, under favourable circumstances, will continue to bear for twenty years. It blossoms throughout the year, so that mature fruit and opening flower-buds may be seen at the same time The rosated seed or bean has been used to form a beverage in Abyssinia from time immeniorial In Persia it is known to have been in use as early as the year 875 From Abyssinia it was introduced into Arabia in the beginning of the 15th century, and about the COFFED MANN, middle of the following century it began to be used in Constantinople, where, in



spite of the violent opposition of the pressts, it seems became an article of general consumption. In 1868, the fir t London coffee-house was opened in George Yard, I ombaid Strict, by a Greek named Fasqua; and twenty years siter, the first in France was established at Marseilles, since that time, both the calture and consumption of coffee have continually extended About forty millions of pounds are unually consumed in this country alone, and the consumption for the whole world has been estimated at about 800 millions of pounds in the London market at the commencement of July, 1962, the cash proces for the cifies of diff in countries in bond were as quoted those we want of the cities of the 92s other kinds 86s to 88s down to 70s to 80s. Jam nica, finest, 120s. other kinds, 75s. to 80s., 71s. to 7 is, and 65s to 70s. Costo Mica, 77s. to 88s. and 70s to 77s. Jica, 70s. to 75s. Mocha, fine, 128s. to 130s., good, 11os to 115s., ordinary, 90s. to 98s. Fel-lichtry, 78s. to 85s. 5f. Downson, 69s. to 72s. The duty, 4f. per 10 and 1 per cent, 18, of course, not ma-childed in these quotations. The above list, taken with our statement respecting the unnual consumption of c fies in Britain, will enable the reader to form some ries of the extent of our trade in the produce of of a dark yellow colour, the Javan and Bast-Indian and larger and of a paler yellow, the Ceylon, West-Indian and Irazinan have a blush or greenish-grey time. Coffee owes its valuable properties chiefly to the presence of an alkaloid called cafferns, and a volatile oil.
It is remarkable that tea should contain precisely the It is remarkable that tea should contain precisely the same principle, theries and outfleine being identical. The sensible properties and effects of outfles, like those of tea, are the well known to require to be stated in deful. It calculated, accuses, and keeps arwive; it counteracts the stupor occasioned by disease, by istigue, or by opium, it allays hunger to a cartain extent, gives to the weary increased strength and viguur, and imparts a feeling of comfort and repose. Its physi logical effects upon the systems, so tar as they have been investigated, appear to be, that, while is much a the lumin more active, theoretical venehave been investigated, appear to be, that, while at makes the brain more active, itsoothes the body gene-rally, makes the change and waste of matter alower, and the demand for food in consequence less In Sumatra and some of the neighbouring islands an humatra and some of the neighbouring issance as infusion of the roasted leaf is used as a substitute for tea, and is called toffee tes. The leaf contains the same punciples as the seed, and therefore has analogous properties. Besides the real O arthoca, some other species are cultivated for their seeds, as, O bear other species are cultivated for their seeds, as, O bear of the contract of the co

a number of timber pies close one rows, according to the nature a depth of water. The distance as from four to ten feet, and the with puddled clay. In some cases is with only one row of piles, backed When the bottom consists of to any. When the pottom consists of connot be driven, they are generally the depth of water allows, of two stone her the depth of water allows, of two stone space hetween them being filled with clay of the substance. A very valuable invendants MKillop, the managing director of Sing-coating Company, has been tried and a successful. The object of the invention, semed the "Portable Cofferdam," is to prothe means of thoroughly examining or repairing at the ressel, from her keel to her water-line, submerged. The apparatus consists of a large when submerged. The apparatus consists of a large shapet of wiserproof carwas, at each end of which is a fainteer bag, which is filled with air on the carwas being handed taut under a vessel's side, when the whole is made air and-water-tight by the pressure on the outer surface. The volume of water contained in the interior of the carwas is then pumped out, and the carries being distended by a framework of iron, a dry

course with the containing the remember of iron, a dry space is kept clear to allow of men repairing any damage the ship in y have sustained.

Corrier, boy on (Gr. kophinos, a wicker basket), is a cheat or box for containing the remains of the dead. Coffine have been in use from very early times; and we are take that the body of Joseph was embalmed and placed in a coffin in Egypt. In that country coffine were usually made of pasteboard glued together, and covered with hieroglyphics; but sometimes these were also indicated in coffine of wood, stone, or eartherware. Among the appient Britons, stone coffins were sometimes employed for persons of distinction, and they are still constitution met with in barrows, together with Roman irms; and the kistvaen, or coffin composed of rough stone set edgewise, and overed with one or more flat stones, was common. We are told that, from more flat stones, was common. We are told that, from the 9th century to the reign of Henry III. and later, ne suffins were in general use for persons of the ever, were only wrapped in cloth, and so put into the ily in use among the Saxons. In some countries, as a Spain, the coffin merely serves the purpose of hold-ng the body while it is carried to the grave or tomb, d is then used to perform the same office for others. In the Bast the body of a deceased person is carried to the grave on a simple bier, without any coffin; and this custom prevails equally among Jews, Mohammediana, and Christians. This was also the practice among the encient Jews, as we know from the account of the widow of Nain's son.

Consolve, Kog-no'-vit (Lat., he acknowledges), is where a detendant acknowledges or confesses the plantaging accounts and are and at the land of the saint acknowledges and are and at the land of the saint acknowledges.

or number of confesses the tiff's cause against him to be just and true, and, at the cause before judgment, suffers judgment against him at come the intered against him at once, or conditions of the continuous o Thinks. It must be signed in the presence of the state of the state of the state of the state of the original cognomic forms. The Queen's Bench the original cognomic forms of the state of and in the courts of Common Free and acceptance of it, with an affidavit of its executed its disability of the countries of the being as it will be considered fraudulent and void as other are littless, and, in case of hankruptcy, and the plaintiff all moneys

stiged contact.

Conswarms. \*\*Contract (Ang.-Sar.).—The large ordered wheels used in machinery are termed our contact where the seath are made of wood. When the oth are of non, they are known as toothed wheels.

e which r would tend to separate them. joined with much more case; cohesion is entirely overcome, the part one another instead of attracting. The one another instead of attracting. The for sion is weakened or destroyed by two genies either by heat, or by the attraction while exerted by the particles of one body on the another. When these powers—heat and chief tion—are withdrawn, otherior resumes in with results that are different, according cumstances under which the withdrawal of body which has been melted is suddenly takes the form of an irregular solid. If, colesion is exerted more slowly, the particles a united in regular forms. (See Currentultation After the particles of a body have been separated, a force of cohesion will make them require if they pressed closely together. Cohesion is the attre exerted by homogeneous or like particles, and difference from adhesion, which is the attraction exerted by heterogeneous or unlike particles.

COHORT. (See LEGION.)

COINAGE. (See MINT.)
COINING-MACHINE, a very beautiful machine for stamping money has been invented by M. Thompelier, which combines economy with perfection of workman ship, durability of the machine, and safety to the operatives. The moving power applied to a rather a steam power, turns a fly-wheel, which gove it, and sums up all its powers the moment a stamped. To the axle of this fly-wheel a spiral curve is adapted to direct the movements of a connectingrod, which transmits to the moving parts the men nism of placing and taking off the metal between the stamps, and withdrawing it when the money is stamped. The power accumulated by the five wheel is transmitted through its axle to a winch, which note upon two arms joined to each other by a hinge at their extremities, and forming a very obtuse angle, which can be opened or closed a little. When this angle is opened, the two other extremities of the arms or levers become more distant, and as the superior meets a buttress, it is the inferior one which moves: It is perly a funicular lever or mechanical knee. Thus, lower part of the inferior lever is drawn towards a resisting plane, when the angle of the two true widens; but, on the contrary, it is carried away from the plane when the angle closes: the movements are produced by the connecting-rod and the winch and to the ily-wheel. The two stamps are placed, the cus at the movable end of the lever, above the metal to be at he movable end of the lever, shows the measure we coined; the other is situated beneath, the two planes being parallel. The pieces to be coined are piled up in an iron cylindrical vessel, and at every turn of the fly-wheel the nether piece is taken away, and prised under the press, being contained within a largely, which limits its circular diameter. When the lever rises, the coin spontaneously leaves the ferrule Cylinders. The principle of this press consists in Cylinders. The principle of this press consists cylinders, having their axes parallel and turn opposite directions. These cylinders have on outer surface engraved matrices, smooth and fur ferrules, as well as ferrules with inscriptions. Fig. Plate XXXVI., presents a transversal section of machine perpendicular to the axis of the ordinal Fig. 2. Plate XXXVI., is a vertical section made throrig. 2. Plate AAAVI., is a vertical section mades this axis. The cylinder A receives the moral the moving power: its axis has length enough the case to have cogs, B, engaged into the rince the axis C. This axis has a fly-wheel, C, and can to work by any moving power through the pulses. The second cylinder (A') is constructed almost it. The second cylinder (A') is constructed almost line the first, and of equal diameter, having the same nutries of matrices. Two wheels (E, E') are connected with one of the extremities of the cylinders, in probe the they may receive motion. In the swollen control the second cylinder (A'), and on its surface, there are executations to receive the matrices (a, Eg. 3, Plate XXXVI.); they are cylindrical. Retailer disher (a sup-

Codering

or from the measurement of the optimizer. In This governed. Butterned (i), heads to make high of the matrices, are inverted, the first interest of the matrices of the street the train out, which, when affected, the futterness are sent back to their original bettien by the spring of the central part of the agent surface of the cylinder A, groves are made to resirve the ferrule matrices of the form of which braisphanael (fig 3), so that they can oscillate, through the rotary motion of the evinders. The plane surface which terminates each matrix, and which is entraved, passes through the centre of the sphere, but the outer arounference of this surface should be somewhat eccentric to the surface of the subere somewhat eccentric to the surface of the sphere Pillius can be placed within the groove under the mattices they are of steel, and can be regulated by a matters they are of steel, and can be regularly sores. The matrices are by this means secured from the catilisators Steel springs (c, fig 1) act upon the slaped edges of the terrule matrices, to force these last to the place they should occupy, as soon as they are no more opposite the matrices a A tube (F) taining the pieces about to be coined furnishes them to the matrice. The circumference or the second eylinder (A) is surrounded with steel plates (f), which have at their centre a sylindrical hole of equal diameter with the matrices a these plates serve to stimp the circumference of the con When the cylinders are placed as represented in fig 1, the lowest piece in the tube I is in contact with the surface of the plate, as soon as the matrix comes to surince of the plate, as soon as the matrix comes to the orifice of the tube, the prece falls into the vacuum formed by the plate and comes in contact with the engraved surface of the matrix. The cylinder con tinuing its rotation, brings the metal within reach of the ferrule matrix, and the coin is stamped on both sides at once. It is then pushed out of the matrice by h, assisted by the s rayer q, which has a counterpoise. The turning pieces of the cylinders are received in pillows, which allow them no lengthwise displacement, and in order that the matrices may be retained in the same plane, perpendicular to the axis of the cylinders, these are exactly clamped between the two chuck process of the cases which contain their pillows Wedges pressed by acrews (A) hold the pillows firmly fixed. The contains as they fall receive no shock, and are received in a box enclosed within J, the framework of the machine Such a machine coms more than a hundled pieces per minute, or sixty thousand pieces in a day of ten hours continual labour. The moving The moving lower required is but slight. This press performs its power required is but shight this press personnel functions without noise and is not liable to be put out of order, its construction is simple, and it requires little room. The workman who attends it is perfectly little room safe during his labour Should any acci lent or obstacle doour, the machine is so arranged that it stops apon tansonsly, the fly-wheel (C') is maintained on the axle by a species of brake (fig 2), which allows it to turn back without turning the axle, when a greater resist abose than usual is experienced by the nistrices, so that the attendant is made aware of the accident. M Beguin has put forth a proposed new method of stamping money, medals, and jewellery This consists method of stamping money, medals, and jewellery. This consists a placing within the matrices a certain number of steel stamps. These matrices being piled one upon the other, are inclosed in a rectangular box and made to place between two cylinders. This pressing is performed rapidly and many pieces are worked in a short time. The stamps are placed within the matrices, and are of a slightly coincal shape. In order that they may be retained at the same level, a strong plate covers the matrices. A thin plate is interposed between the two matrices. A thin plate is interposed between the two matrices, and is pierced with a number of holes equal implifies, and is pierced with a number of holes equal to the stamps its use is to keep the pieces to be stamped in connection with the stamps. This plate is used of steel, having its surfaces even, and an equal band in all its points. The machinery is carefully fixed in a rectangular frame, which is of iton, and hadds the different parts so firmly fixed that they are such daranged shile between the rolling cylinders. We have proposed to furthers describe the points of the resulting in the proposed to the machine. is usage of steel, having its surfaces even, and an equal fashiness in all its points. The machinery is carefully fixed in a rectangular frame, which is of non, and inside the different parts so firmly fixed that they are more proposed to further describe the points of this part of our proposed to further describe the points of this basisful machines as figured on Plate XXXV. In I is a lateral alevation of the machine. A is the principal safe, turned by a window the view proposed to the lever C the movement of the winch.

joined to the lever by the in optinder b. If is a sliding d it is maintained by a double joined to the iork-shaped, bearing the two balls H. I against D. The supporter and the lever revolve round an axle in d. I, an iron is against D. The suppose. The iron letter, isseen revolve round an axle in d. I, an iron letter, isseen from another lever, concealed by the machine, an pulsion transmitted by the eccentric fixed to the pulsion transmitted by the eccentric fixed to the fixed to the pulsion of the lever I, and destinate the fixed the the machine comprises several pieces; wa, the plates of the ferrule, the ferrule, to. I do which receives the metal about to be compat; which receives the metal about to be school; M, a passage through which the companies of file, and the basket, N, fly-wheel, O, a cast-iron glast attached to the axie of the fly wheel, T, cast-iron glast attached to the frame of the machine (R), likewise saide of the machine, Q, Q, four cast iron columns giving support to the frame of the machine (R), likewise saide of cast iron. For a description of the methods of soming money at the Royal mint, see the article Mint.

Coln (See Numishatics)

Coln (See Cocol Nut First)

Coln, loke (Ang Sax ) is the dense character maintenance.

COAP, Aoka (Ang Sax), as the dense observed imministration of the retort after coal has been submitted to destructive distillation. It consists almost emission of carbon, with an admixture of mineral matter. As police contains so large an amount of carbonassous matter, it is particularly valuable where an intense seat without smoke as required. It is therefore much simply and for smelting furnaces, but its clef use is as is second-tive fucl, and it is made for this purpose in energous quantities by the different railway companies. quantities by the different railway companies. The simplest way of coking coal is to burn the inter material in large heaps in the open air, downing them with ashes and earth to prevent combustion taking place too rapidly, but this method was found to take up a great deal of space, and experiments proved that the resulting coke was not so dense or valuable as when a coking own was applied. a coking oven was employed. These ovens are generally ranged in rows of one hundred or more, a railway pany ranged in rows of one hundred or mayer, ranking being laid along their roofs for the entrepance of the coal and withdrawal of the coke. The heat has to be regulated carfully during the process, which takes to thirty or forty hours. When coking is properly conducted, a very small portion of unconsumed gas and soot escapes and the coal, if good, yields 30 per sent. of compact coke

of compact coke

Coi (HICUM kol take hum (after Colema, its native country), in Bot, a gen of plants belonging to the nat ord Melanthacee The most important species is C autumole, the common meadow-passron. This is an indigenous perennial, growing in themselves. This is an indigenous perennial, growing in themselves of Hiretordshire, Worcestershire, Gloucestershire, and other countries. It blessems during the months of August and September, its flowers being croous like, and of a purple colour. Take plant offers a strange contrast to most others in the mode of producing flowers and fruit. The flowers supposed furing flowers supposed furing a strange contrast to most others in the mode of pro-ducing flowers and fruit The flowers appear during the autumnal mouths named, rising from the ground without any leaves, and, when they fade, nothing further is seen of the plant until the following spring, when tuits of leaves make their appearance, inclosing the seed-vessel or capsule, which ripers about hay-havest. Both the seeds and corms of this plant are employed medicinelly in contracting.

ing the earth that surrounds them, so as to form an open oval space; others form a ind of occors or web round them; and some samme the perfect state without any sort of preparation. Although some of these meets may be murious to vegetation, taken as a whole, there can be no doubt that their existence is conductive to man's conductive, and in some cases to a much greater extent than he suspects. Thus, the ingrebecties (Corandala, the diving-bestics (Dytacrda), the lidy-birds (Corandala), the diving-bestics (Dytacrda), the lidy-birds (Corandala), and many others, do mankind great secrete by preying upon caterpility, plant lice, for while the many dung-bootles (Copriside, Huts-the, Sootsupada, &c.), do good work as removers of tarrion and as nearengers generally. Others there are same, Geograpsian, &c ), do good work as removers of married and as accuragers generally. Others there are which sublist on the various poisonous fungi, and where, again, which attack dead but still standing the standing are the ground. The cause them to cease the causer the ground. Court, kel'-ie (Gr. kelon, the colon), in Med, is a managiven to several diseases which are characterized if agrees pain of the howels, with distansing or flat-

but without looseness or diarrhea Medical nee, but without loogeness or constraint that so destruction no fewer than seven different kinds of this complaint; as, 1. Spasmodic, in which the principal symptoms are sharp and spasmodic pains about the el; 2. Stercoraceous, when the pun is accompanied with countypation of the bowels, d. Accidental, when result our consumption of the powers, o. Accidental, when no consumed by indigestible food, or by acide matter in the interines; it Bulous, when accompanied with remning of bile or with obstinate costveness, 5. Flatulent, when it arises from flatulence in the bowels 6. Inflammatory, when accompanied with heat and inflammation. 7. the Lead, Painter's, or Deconstitute inflammation . 7. the Lead, Painter's, or Deronskire solve, the dry bellvache which is attributed to the posson of lead. Among the most irequest causes of this discase may be named poisonous or unwholesome sub-stances, long-undigested food, redundancy of virtated late, intense cold, worms, &c The treatment will, in bile, intense cold, worms, ac each case, depend very much upon the cause, generally, the first object is to procure an evacuation of the howels by mild and untritating aperients Opisits may be resorted to in order to allay the spanes, and warm bath and fomentations are often of great nervice. It is usually necessary to persist in a course of mild aperients for some time, and all irritating substances in the food are to be avoided.

COLISEUM. (See AMI MITHBATES.) Coulaires, kol-lapse (Lat. collapsus, from collabor, I shruk down), is a wasting or shrinking of the body, or of a part of it, or a sudden and extreme depression

of its strength and energies of the neck), the part of Conlin, to the fur (Lat rollum, the neck), the part of a garment which surrounds the neck, or something worn round the neck, as a chain or ring of metal Among the smearts, collars were sometimes won as hadges of servitude. Several orders of knighthood are distinguished by the collars which they were These collars are made of gold, enamelled, and frequently set with ciphers or other designs the badge of the order is attached to the color, and less on the order is attached to the color, and less on the breast when worn. The color of the order of the Garter country of twenty are preces, each in the forms of a garter, commelled soure, and connected by gold baks. The Gronge, or figure of St George on with his. The George, or figure of St George on serial hole. The George or figure of St George on serial hole. The George of the precess which form the coller of the Gerter is the mette of the order,—"Hom see shi make pense."

active pulmant plense."

Colascensal, belditte-ril (Lat collateralis), that which hasps by the side, not direct; as cilateral assurance is that which is made over and above high primitipal deed itself, Collateral security is where a deed is made of other lands or property beside those principal seed itself. Conditions seeking which a deed is made of other lands or property is which a granted by the principal mortgage or other security; and if a man coremants with another, and enters into a bond for perferenance of his covenant, the bond as bond for perferenance of his covenant, the bond are collisional assurance, because it is external, and without the nature and secence of the covenant.

see manage and resence or the coverage.

Outherness Commandurants or Kindness —Callafood relations agree with mean in this, that they
descend from the same stock or ancester; but duffer in this, that they do not descend one from the other. Collecteral binsmen are such, there as incally spring from one and the same such, there as incally spring from one and the same such; who is the starts or

root,—the stopes, truth, or common stock whence these relations are branched out. (See Issum.) Collarion to a Brunsion, hel-led-sinu, is the sot of conferring or bestowing a benefice by the bishop, or other ordinary, where he has the right of paironage. It comprises both institution and presentation.

Collect, kell-lekt (Lat. con, together, and legs, i read), is applied to certain short prayers in the Lithney of the Church of England, as also in that of Roma. It is, as the name implies, a prayer read together with other parts of the service, either usually or on a particular occasion.

Collection with the left the cong in certified in Tit to

COLLECTANEA, kol-lek-tas'-ne-a, is applied in Lit to a book containing a selection of passages from various authors, usually for the matrix tion of youth; as the

Collectanea Graca.

COLLEGE, kol les (Test. collegeum, a collection or assemblage), primarily denoted an association or body of men united together by the same laws or customs. or in the same office or employment. Hence, among the Romans, we find the word applied not only to corpor ations enjoying certain rights, as the priests, augure, Ac , but to men in the same office, as consuls, questors, tribunes,—to any body of merchants or mechanics, or even to an assemblage of the means at citizens or slaves, In a more limited sense it was applied to a corporation or association of persons, of which there were many at Rome, and which required confirmation by specia ensetment. They possessed property as a corporate body, and had a common chest. In Lugland a college la a society of persons existing as a comporate body, either by prescription of by grant of the king, and as the colleges of physicians and surgeons A colleges; os me colleges of physicians and surgens. A college is also an academical institution, endowed with revenue, and subject to a private code of laws. Its particular form and constitution depend upon the terms of the foundation. The terms colors where versity are often confounded in modern times, and in Scotland and America the distinction has been very much lost sight of A college is an institution for the advancement of learning, a university is fit the con-ferring of degrees. At Oxind and Cambridge a college has a twofold character,—I as an endowed college has a twofold character,—I as an endowed society, composed of a his di, thlows, and scholars; and 2 as a place of education (See University, Cambridge University, Acc). The celeges of I nuce are very different from those of it security, being educational institutions established throughout the country, and bearing some re-emblance to the German grunnasis. There are about 320 in all, and they are under the control of the Line very of Entered. control of the Lniv raity of France

COLLEGE OF JUSTICE, in Scotlind, consists of the supreme civil court, or Court of Session, with all its members and officers, including advocates, clerks of session, clerks of the bills, writers to the signet.

collectors before the supreme courts, &c.

Colling Giarra Chunch, holder heart, &c.

Colling Chunch, holder heart, is so called from having a college or chapter of canons attached to the but no bishop, and thus differs from a cathedral, which is the see of a bishop. It is under the jurisdiction of the hishop of the diocese in which it is situated.

COLLEGIAMS, kol-le-je ānie, a religious sect formed among the Arminians and Baptists in Holland about the heginning of the 17th century. They received the name of Collegiants because they called their assembles colleges. They assemble twice a week, and any cone is allowed to avoiced the Suprementations. one is allowed to expound the Scriptures or offer up They hold sacred conventions twice a year sa Rhemsberg, near Leyden; whence they are sometimes culled libeinsberger

COLLODION, kol-lo'-de-on (from Gr. kella, glue), in COLCORION, action-news (from cr. seems, grows, and colon), to a solution of pyrrxy, but in a mixture of ether and alcohol evaporate, leaving habind a thing tough pellude. It is used exclusively in pharmany, for forming an artificial skin on excernited sarriages, and

Iorning an artificial sain on excursions sension, in photography. (See Photography.)

Coult ston. (See Constract)

Coult ston. (See Constract)

Coult sidn. (See

### Collyrium

to the Virgin, celebrating annually a colonia feast in her honour, at which they offered cales. COLLYRIUM, holding-tum (Gr. holderen), in Med.,

was formerly applied to any medicament employed restrain defautions; but it is now confined to topical remedies for disorders of the eyes;—an eye-salve, or eye-wash.

COLOGASIA, kol-o-kell-as-a, in Bot , a gen. of plants belonging to the nat. ord Ararea. The species C. esmuch used as food in Madeira and the West Indics, where they are known as coose, eddoes, or yams (See Dioscoura for the true yams) C himalents has also edible coims, which are used as food in the Himalayas C antiquorum in Fgypt, and C macrothiza in the South Sea Islands, yield corms which are easen

COLOGYNTH kol'-o-sinth (Gr kolokunthie), the bitter cuamber or bitter spple, a woll known custin hydra gogue cathartur. It is the fruit of the Catralius colorystaus, a plant belonging to the nat ord (uurbitueea, and supposed to be the "wild vine" of the Old Testand supposed to be the "wild vine" of the Old Testands und supposed to be the "wild vine" of the Old Testands und supposed to be the "wild vine" of the Old Testands und supposed to be the "wild vine" of the Old Testands under the old the old the old Testands under the old Two Linds of colocynth are known in commerce; namely, Turkey, or pecied volocynth, which is imported from the Levant, the north of Africa, and smpored from the Levant, the noth of Arica, and Spain, and Mojadore, or impected colocynth, which comes from Mogadore. The former is the best, and is generally employed in medicine, the latter being principally used by ohemists for their show bottles. The seeds possess the purgative property to a slight extent; but the pulp is by in the most active part of the fault. In large doses, colocynth is an initiat poson It owes its properties to a peoult a bitter prin caple, which has been named colocyuthan

COLOGNE EARTH, lo lone, an carthy mars of lighte, occurring in a large megular bed forly or lifty feet thick, near Cologne When hysgated, it forms a pigment of a brown colour. It is composed of wood

partially fossilized

COLON, ko-ton (Gr kolon, a member or linb), in Anat, is the largest of the intestines, or, rather, the largest division of the intestinal canal. This canal is divided into the small and great intestines, the former consisting of the duodenum jejunum, and if um, the latter of the cocum colon, and rectum Inc Lieut meter of the execute colon, and rectum in the true subsequences in the right it at losse, in a clustation of considerable size, called the execute it ascends through the right lumbar and hypochondrise regions to the under surface of the liver, passes transversely across the abdomen, on the emilies of the supgrature and umbinded regions, to the left hyp chondriae region descends through the left lumbar region descends through the left lumbar region. to the left that fossa, where it becomes convoluted, and forms the sigmoid florure, from which the rectum extends to the anus The colon is this divided into four parts—the ascending, transverse, descending, and the sigmoid flexure The colon, in man, as rage a from 4 to 5 feet in length, and about 2 inches in diameter, being about a furth part as long, and twice a wile, as the small intesting. The causi is not smoot than unsilorm, as in the small intestines, but bulges out between the bands of muscular fibre into various promanences, more or less regular in their form, in which lodge for a time, and become deprived of much of their moisture as they are relied onwards by the peristaltic action to the rectum and anus solon is enveloped in the serious membrane called the peritoneum, which folims the external covering of all the abdominal visions at (See External covering of all Coton, in Gram, is a point or character formed

thus (1), and 19 used to mark a pause loss than that
of a period, and greater than that of a semicolon,
errather it may be said to be used where the sense of a passage is complete, but the sentence is not concluded
It distinguished a member of a sentence which and a member of a sentence which would make a complete as ntence of steelf, but is followed by an additional part, making it more full and complete lu practice, even among the best writers of the present ded; and, indeed, the furmer is now going very

much out of uso.

COLOREL, Lur' nel (Fr), the designation of a field officer who has the command of a legiment or bat taken The colonely of a regiment is generally given to some meritorious general officer for distinguished services, and the office is a sincoure, the sotual com-

### Colony

mand of the regiment devolving on the lieuteness, calculd, who is responsible for the drill and disciplies of the corps. The term is not found in English miliof the corps. The term is not found an Anglesh mist-tary history prior to the regn of Queen Elizabeth, when colonels were appointed over regiments divided into ten companies, each commanded by a captain. It is supposed to be derived from the Latin cerosavins, which implies the act of installing an officer in the command of a corps of men, and thus teems probable, as coronal is the Spanish title for an officer of this rank

COLONIZATION. (See COLONY.)
COLONIZATION SOCIETY, kel-on s-seet-sheen, is a society in the United States of America, founded in 1816, with a view "to promote and execute a plan for colonization". nizing (with their consent) the free people of colour residing in that country, either in Africa or some other place, as Congress shall deem expedient." Shorten, place, as Congress shall deem expedient. Shormed, on the western coast of Africa, was selected as a substantial specific the colony, and in 1820 the first slap was more than 1,200 inhibitants; and subsequently it received the name of Liberia. In 1847 Liberia, with received the name of Liberia. In 1947 Liberia, with the full consent of the society, became an independent

the full consent of the society, became an undependent republic. From the foundation of the scenety down to 15 19 its receipts have been 1,390,939 dollars, and it has sent out no rely 10,000 emigrants. Colonnable, kell on-aid (Lat columns, a column), the name given in Arch to a row of columns which see pour a root projecting from the building, and sup-port a root projecting from the building itself, thus forming a portice. When a colonnade is continued round the whole of the arterior of a landding or the forming a portice. When a colonnade is continued round the whole of the exterior of a building, or the interior if it be a quadrangle with a court in the contra-tive called a persistle Colonnades are to be seen in int of the British Museum, the Italian Opena-House, Covent Garden, and round. Her Majoriy's

The stre in the Haymusket

The tre in the Haymai Ret Colonia, a possession in land, a furn, from colo I till or cultivate), originally arguilled a number of persons transferred from one country or place to another, where ha, ds were allotted to them. Dr Johnson defines to be "a body of people thawn from the mother-country to making some distinct place' It to this we add that they still retain a cortain political connection with the mother-country, t definition will be sufficiently correct. Four kinds of colonies are distinguishable—1 Such as serve to case the inhabitants of a ccurrry where the people have become too numerous to subsist conveniently together, 2 those established by vactors among a war-quished people, to keep them in awe and obedience; 3 those 1 rmed by emigrants driven by oppression from their native country to seek peace and subsidence in distant parts, 4 such as are formed solely for parposes of time. In the fast of these senses, colonization must have taken place at a very early period of the world a history, when the human race began to the world a history, when the human race the world a history, when the human race began to disperse, first though the various regions of the East, and afternaids through the more remote parts of the globe likese, however, were not strictly colonists, in the sense in which the word is now used, for the parent country had no control over the settlers, and afforded them no protection. The Phenmonia were the eathert people that we have an account of conding out coloures. In their commercial enterprises they established colours in Cyprus, Crete, Sieil, and other relands of the Mediterranean, and on the coast of Spain The Greeks were early prompted to colonisation by the narrow limits of their territory, and they established communities in Asia Minor and the islands and coasts of the Mediterranean Still, though these communities were in close connection with the parent states, they were not strictly colonies in the modern ecuse of the term. The Romans were the flist people to organize a system of colonization under which the colonists still remained subject to the central power. The earlier Roman colonies were formed by establishneg bodies of Roman colonies were formed by examin-ing bodies of Roman citzens in place taken in war, who exercised ambority over the vanquished, and kept them in subjection to the Roman power. Colo-mes were the outpost of the empire, the means by which the Latin language and civilization were unpressed on subject peoples According to Serving.

place, furnished with dwellings given to them under certain conditions and regulations." They are sent out by a decree of the state, or with the general consent of the people. "Those who lears without such a consent, but in consequence of civil dissensions, are not colonies." The Romans had two kinds of colonies, but in consequence of civil dissensions, are not colonies. The Romans had two kinds of colonies, but he Roman and the Latin. The inhabitants of the former had nearly all the rights of Roman cilizens, except suffrage, and observed the laws, religion, said feativals of Roma. The Latin colonists, on the other hand, though subject to the supremacy of Rome, formed a season at cousti-Rome, formed a separate state, and possessed a consti-tution of their own. They did not enjoy the rights of citizenship, and in war served not in the legions, but among the suxiliaries. There were also military colos which consisted of soldiers to whom land was given, Instead of pay and provisions, after their campaigns. In modern times the states of Genoa and Vonce were the first to turn their attention to colonization. The colonial establishments of the Genoese were commercial, similar to those of the ancient Phonicians. They were governed by consuls sent from Genoa, and the order and justice of their administration have been much extolled. The Venetian colonization was of a more military character, like that of Rome. They sought conquest and do-minion, and ruled over the earlier inhabitants of the minon, and ruled over the earlier innabitants of the countries. Portuguese colonization much resembled the Venetian, establishing military despotisms to centralize the native trade. As Portugal declined in colonial power, Spain rose into entinence,—mainly in consequence of the discovery of the New World. Their settlements were essentially military. Gold and silver were the main objects of their enterprise,—not as the legitimate proceeds of commerce, but as the spoils of force. At a later period, these settlements underwent modification toward a commercial character. The Dutch, after establishing their independence, soon turned their attention to extending their commercial relations in foreign parts. By the early part of the 17th century they had taken, one after another, all the Portuguese settlements in the East, with the exception of Gos; and by the middle of that century their power had reached its height: their possessions under the jurisdiction of the governor of Batavia had attained the extent of an empire; and these magnificent results were accomplished by a trading company, like the English East-India Company, and managed by a board of directors in Europe. The chief object of the Dutch in colonizing was to increase and to monopolize their French colonized Canada, and, on the whole, in a humane manner; but their establishments were too much of a military character, and the civil population increased very slowly. Louisians they bought from Spain, but made little progress in it, and sold it to the United States. Their recently-acquired colony of Algeria was obtained by conquest, and has had to be maintained at a great cost of blood. The English colonies have been acquired in almost every possible variety of way,—by settlement, by conquest, by treaty. They have generally local legislatures, elected by the people, and a governor and council named by the sovereign. "The Phonician colonies were factories; the Roman colonies were garrisons; the Spanish colo mies were gold-mines worked by slaves; France justly mes were gounded to the Algerian colony in our Exhibition under the heading Ministry of War. The Greek cities, in the hour of their greatness, founded new cities the counterparts of themselves. England has had the honour—an honour which no disaster can now rend from her—of becoming the parent of new now read from her—or pecoming the parent of new mations. To colonize in this, the highest sense, is the attribute of freedom."—(The Foundation of the American Colonize, by Goldwin Smith.) There are numerous theorism questions in politics connected with this leaf which our limits do not admit of our enterpoin. Colonization has been one of the most than the great of civilization. The portant means in the spread of civilization. stion that founds a colony in an unoccupied counary, or in a country occupied only by savages, ex-tends the empire of civilization, it may be to an indefinite degree. The commercial intercourse that springs up between a mother country and her colo- of this kind in modern times is the colossal statue of nies in necessarily of great advantage to the former; Bavaria, at Munich. It represents a Titanic Virgin, 532

but after a colony has been fully established, and such a footing as to be able to maintain itself, it comes to be an important question how far it is right or proper to the mother-country to retain it is subjection. It is rarely the case that a colony yields a greater revenue than is required for its government and defence, and the deficiency must necessarily fall upon the mother-country. The total expense of her various colonies to Britain is upwards of 24,000,000 monable. annually. "If our present relation with a colony such as Jameica or Canada entails any expense on the mother-country, we may ask whether all the com-mercial advantages that result from this relation would not be equally secured if only the free commercial relation existed, and that of administration were to cease. In support of this view, it is shown that the commerce of Great Britain with the United States, now free and independent, has increased most wonder fully since the separation, and probably more rapidly than it would have increased under the colonial system. This being the case, a similar increase might be anti-cipated in the trade with all those foreign possessions. whose trade is really of any importance. (Article Colony, in English Cyclopædia.) No colonies were ever reckoned half so valuable as those which now form the United States; and it was generally supposed that their emancipation would be decisive of the fate of Britain. On the contrary, however, our trade, our wealth, our power, have been greatly increased.

COLOPHON, kol'-o-fon (Gr.), in Ribl., is applied to the conclusion on the last page of an early-printed book, where the printer's name, place, date, &c., were inserted, before the introduction of title-pages. It is taken from the Greek proverly "to put a Colophon to famous cavalry of Colophon, an Ionian city of Asia, whose charge usually decided a battle.

COLOQUINTIDA. (See COLOCYNTH.)

Colossians, EPISTLE TO THE, ko-losk'-yanz, is one of the smaller canonical epistles of the New Testament, addressed by St. Paul to the Christiaus of Colosses, a city of Phrygia. The evidences in favour of the authenticity of this epistle are so strong, that few even of the extreme rationalists of the present day have ventured to deny it. It is generally believed to have been written by the apostle Paul from Rome about 2.D. 62. There is a very close connection between this They epistle and that addressed to the Ephesians. were both written about the same time, and the condi-tion of both churches was somewhat similar. The chief object of the apostle in this epistle was evidently to counteract certain philosophic or Judaistic doctrines that had crept into the Colossian church, and which he regarded as endangering the purity of the Christian religion. He exports them steadfastly to adhere to the doctrines which he taught, and to reject all such errors. From the allusions made to them in this epistic, we gather that in many respects they resem-bled the dreamy speculations of the Jewish Essens, moulded and extended by contact with the false philosophy which, under the form and name of Gnosticism. prevailed over the East.

prevailed over the East.

Colossus, ka-los'-sus (Lat.), a word used by the ancient Greeks and Romans to designate a statue of gigantic size. The most remarkable work of this kind was the Colossus of Rhodes, a statue of Apollo, or the Sun, which was so high that, it is said, ships in full sail could pass between its legs. It was considered one of the soven wonders of the world, and was the work of Chares, a pupil of Lysippus, who spent twelve years in making it. It was 105 Grecian feet in height; and stood with extended legs on the two moles which and stood with extended legs on the two moles which formed the entrance into the harbour. According to Pliny, it cost 300 talents, and few persons could embrace its thumb. Within was a spiral staircase, which led to the summit, whence, by means of a great mirror attached to the neck, Syria and the ships proceeding to Egypt might be seen. This famous statue was thrown down and shattered by an earthquake in B.C. 224, about iffly-six years after its erection. For 283 years the fragments lay about the base, when they were sold by the Saracens to a Jew of Enfess, who loaded 900 camels with the metal. One of the most remarkable works of this kind in modern times is the colossal statue of

majestic beauty, with a lion by her side, and et in height, standing on a granite padestal

is 54 thet in height, standing on a granite pedestal 50 feet high.

Colorya, issulting (Lat. color).—The source of all colors is light, as may readily be seen on salling to remembrance the colories and almost indistinguishments are to discuss in a toom from which the light has been mearly entirely excluded. When the light wholly shut out, all is dark, and we cannot distinguish anything in the recom; but as it is gradually re-admitted, we begin to recognize the forms of objects, all of which appear to be of a dark neutral tint, and at last, when the sun's rays, or rays of artificial light, are permitted to illumine the spartment, everything appears in its proper and neutlar colour. The pure white light of the sun can be separated by a simple experiment (see Dispersion, Raymanow, Paismario Colours) into tints which range in the following order:—red, orange, yellow, green, blue, violet, and indigo. These tints were supposed to be the primitive colours; but it is now known that light consists of rays of the three primitive colours, red, blue, and yellow, and that the others, which were originally ranked among the primitive colours, are in reality, secondary or complementary colours, formed by the union of any two of the primitive ities. Now, when the sunlight isle on any object, it either reflects or absorbs the whole of the rays of which light is composed, or it reflects some and absorbs the remainder. When the whole of the invidental light is light is composed, or it reflects some and absorbs the remainder. When the whole of the incidental light is reflected, the object, if it be unpolished, appears to be white; if all the rays are absorbed, it seems to be black; but if part of the rays are absorbed and part reflected, it appears to be of the colour of those rays that are reflected; thus, simply, if all the rays except red are absorbed, and the red rays only are reflected, the object will appear to be red; if all except the blue rays are absorbed, it will seem to be blue. All variations of colour are produced by the reflection of certain rays in combination: thus, if the surface of any object or material absorbs all the red rays, reflecting those of blue and yellow, these will form green by combination, and the article will reflect or scatter rays of a green tint, and appear of a green colour. When light, therefore, talk on any body, if it be polished, the rays are almost entirely reflected; but if its surface he without polish, and opaque, a part of the rays of which light is pouss, and opaque, a part of the rays of which light is composed are absorbed, and part reflected, which causes the surface to assume the apparent colour which it presents to our sense of sight. The perception of form, however, is caused by the endless variation of light and shadow falling ou the projecting and receding portions of any object; and when a painter represents portions of any object; and when a painter represents any person or thing on canvas or paper, he produces the appearance of roundness, angularity, and solidity, that belong to the form of the object he is gainting, by making the tint that he is using lighter for those portions on which the light falls, and darker for those that are in shadow. Thus, in representing a piece of armout formed of registed steal, the high lights which round. are in shadow. Thus, in representing a piece of armour formed of polished steel, the high lights which represent the prominent points and ridges, from which the light is reflected with the greatest brilliancy, are put in with opaque white colouring matter, while those parts which are removed from the light, or which, in parts when are removed from the ngm, or when, in other words, are in shadow, are represented by pignestis of a dark colour, or very dark shades of the normal sint which the entire surface of the object naturally exhibits. A further notice of colour connected with the fine arts will be found in the article databased to Painting (No. PINTING)

devoted to Painting. (See Painting.)
Conform Blindness is a curious defect of vision, from which the eye is incapable of distinguishing colours. It is of three kinds:—(1) An inability to colours. It is of three kinds:—(1) An inability to distinguish any colour, properly so called, the person being only able to distinguish white and black, light and shade. (2) An inability to distinguish between the primary colours, red, blue, and yellow, or between these and the secondary or tertiary hues, such as green, purple, orange, and brown. (3) Inability to distinguish nicer shades and hues, as greys and neutral tints. The first form is rare; the second and third are common. Dr. George Wilson found, that of 1,164 persons examined by him in Edinburgh, 65, or 1 in 177, were colour blind; of these 21 confounded red with green, 19 brown with green, and 25 blue with green. The colours most liable to be mistaken with

### Column

each other are,—(1) Red, fall and bright, including ormson, easylet, and the redder shades of orange, with full and bright green; (2) brown, including dull red, with dark or dull green; (3) purple, including pink, erimson, illac, lavender, and other mixtures of red and blue, with blue; (4) green with blue; (5) red, including crimson sand searlet, with black; (6) including crimson sand searlet, with black; (6) including crimson sand searlet, with the purple, of the control of all colours, such as straw-colour, &c., with white; (7) dark shades of all colours, such as sharet, purple, olive, blue, with black. Colour blindness is hereditary, and generally shows itself in more than one member of a family. The cause of it is not known, but it is generally referred to some peculiarity of structure in the retina or brain. The subject is of great practical importance, from the extent to which coloured signals are employed or railways and at sea.—Ref. Researches on Colour Blindness, by Dr. George Wilson—Edinburgh, 1855. Wilson-Edinburgh, 1855.

COLOUR PRINTING. (See POLYCHROME PRINTING.)
COLOURING MATTER, kull-ur-ing.—Most vegetable COLOURING MATTER, kww-nr-ing.—Most vegetable substances contain colouring matter that can be separated from them. Many of them are used as dystuffs. They are found in all the different organs of plants. In madder and turmeric they are found in the roots, in logwood and fustic in the wood, in quercitron in the bark, in safflow they are furnished by the authers, while in susatto and Persian berries they are obtained from the seeds. Many colouring matters are possessed of ne tintarkil. and retain nerries they are obtained from the seems.

Many colouring matters are possessed of ne tinctorial power as they exist in the plant, and it is not until they are brought into contact with some chamical agent, such as oxygen or ammonia, that they give evidence of any colorific property. Examples of these may be indicated in the cases of indigo and the lichens. colouring matters generally are destroyed by oxygen, chlorine, and sulphur, especially when these bodies act in conjunction with solar light. There are, however, exceptions to this, as some colouring matters require to be oxidized before developing any colour. Colouring matters which are capable of fixing themselves to fabrics without the intervention of any other substance, are called substantine colours; those which require a mordant are called adjective colours. The colouring matter of animal substances appears to be due in a great measure to iron. In minerals colour results from a variety of different elements,—iron, chromise, and copper appearing to play the largest part in painting the earth.

COLTSPOOT. (See TUESTLAGO.) COLUMBID E., kol-um'-bi-de (Lat. columba, a dove), a fam. of birds comprising the pigeons, doves, and turtledoves. The Columbids are chiefly remarkable for the way in which they feed their young. The bird's crop is furnished with numerous glands, which, in both sexes, become developed during incubation. These glands secrete a sort of milky substance, with which the food that present into the contract of the that passes into the crop is moistened. Saturated with this fluid, the food is regurgitated by the old birds

for the nourishment of the young. (See Pickon.).
COLUMELLIACEE, kol-u-mel-le-ai-se-e, in Bot, a small nat. ord. of dicetyledonous plants in the sub-class Corollifloræ. It consists of the single genus Columellia, which includes three species,—evergreen shruhs with opposite exstipulate leaves and unsymmetrical terminal vellow flowers. They are native of Mexico and Peru. Their properties and uses are unknown.

COLUMN, koll-um (Lat. columns, a column), in Arch., the name given to a pillar which is used to sup-nort a superincumbent weight in various ways. It port a superincumbent weight in various ways. consists of three parts, the base (see Base); the capital, which gives the distinctive character to the whole column in classic architecture (see CAPITAL); whole column in classic architecture (see CAPITAL): and the shaft, which forms the central part of the column between the capital and base. As the peculiar forms of the capitals of the five classic orders of architecture have been already noticed, it will merely be necessary here to treat of the shafts only. These were circular in form; but the external surface of columns of all orders except the Tuscan were fluted or orgamented with longitudinal grooves running from top to bottom. They are generally about twenty in unmbers and in Doric columns they are flat and shallow, and without fillets between the grooves, while columns of the remaining orders have fillets between the grooves.

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### Column

and the grouves themselves are much deeper, having their bornsontal section in the form of a semicircle or semi-slippe. Sometimes the fluting is filled up to one-third the height from the base with casing, either plain or organisated. The Greeks and Romass out their columns in such a manner as to make them swell out slightly at the ut one-third of the entire height from the base. This was called the estate of the column, and was effected by means of a sliding rule known as the rule of Kimmedea. The measurement and proportion of solumns were regulated by the diameter of the lower and of the shaft, which was divided into two parts selfed smodles, each module being subdivided into the strictly minutes. Peculiarities in the columns used in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods will be achieved in the architecture of different countries and periods and the architecture of different countries and periods will be achieved in the architecture of different countries and periods and the architecture of different countries and periods and the architecture of different countries and periods and the architecture of different countries and periods architecture of the achieve and periods will be noticed in the articles devoted to each style of

architecture respectively (see Plate XXXVII.).—Ref. Bir W. Chambers's Architecture; Stuart's Athens. Convers.—In Mil., when a body of troops are dispeed in such a manner as to present a narrow front, leg are said to be in column. The term "in column" is diametrically opposed to that of "in line," when properresent an extended front. A division or brigade be formed in column of battalions, and a regiment or battalion in column of companies, the regiments or companies, as the case may be, being generally moved to the rear of that on the right or left flauk. In manusuring a single company, it may be formed in rotumn of subdivisions or sections; in forming close column of sections, the formation is made on the second section, or left section of the right subdivision; the first section moving to the front of it, and the third and fourth to the rear. When sections, subdivisions, companies, or regiments, forming a column, are at such a distance from each other that they can wheel into an unbroken line, they are said to be in open column; when within one-fourth of the length of either of the divisions named, they are in quarter-distance column; and when within a few paces of each other, in close column.

Coma, ko-ma (Gr. koma, from keo, I lie down), in Path., is used to denote a diseased condition of the brain, manifesting itself in a state of insensibility resembling sleep, from which the patient cannot be aroused, or only in a very partial degree. Coma may result from congestion or hæmorrbage in the brain, or from any abnormal pressure on that organ; from the agency of narcotic poisons or alcohol; from exhaus-tion arising from the loss of blood, or from the action on the blood of various morbid products generated within the system. Slight come differs but little from within the system. Slight come differs but little from profound sleep; but in complete come the patient is entirely shut off from the external world, and is quite dead to all external impressions. Medical writers distinguish several varieties of come, the chief of which are the some vigil and the come somnolentum. The former is characterised by a constant disposition to sleep, without falling into a quiet, sound, or natural slumber, accompanied by delirium, muttering, and agitation; the latter is marked by profound sleep, without the power of awakening spontaneously, and, if roused, almost immediately sinking into the same state. Any of the forms of come may come on suddenly, and Any of the forms of come may come on gra-finally, and be of short duration; sense and voluntary motion as slowly returning. When its accession is motion as slowly returning. When its accession is slow, it often commences with drowsiness or headache. The causes and characteristics of this disease being so various, its treatment must also necessarily vary : generails, the object is by means of stimulants and counter-tritients to avouse the patient to consciousness. Communities, kom-bin-of-shun, in Pol. Econ., is defined to be "an agreement or union among work-

people to effect an increase of wages, or some modification of the terms of the terms. or of the terms or conditions under which they are engaged. This is the sense in which it is commonly used, but it may also be applied to a union among masters or employers to keep up prices or keep down waves. Formerly the government considered it its to interfers largely in contracts entered into the masters and servants. In particular, severe were loosted against workmen combining together

# Combretaces

appointed to impuire into and seport upon the terms of this report, so to Gose, IV. a. 95 (198) passed, repushing all the statute and commanded against one binding of masters or of working provided a summary mode of coveration and a provided a summary mode of coveration and a provide a summary mode of coveration and a provide a summary mode of coveration and a provide of the statute of the sta combinations for that purpose. This state been found defective, another was passed the year (6 Geo. IV. c. 129), which now regulates this subject. It legalizes all meetings or agreements, either yearly in which any property of the control of t subject. It legalizes all methings or agreements, extent verbal or written, for regulating the rate of stages or hours of work; but, at the same time, it imposes a penalty of not-more than three months imprisonment, with or without hard labour, for any one using violence or threats to make a workman leave his hiring or return work unfinished, or refuse to accept wor belong to any club or contribute to a common fund. or pay any line for not belonging to a club or con-tributing to a common fund, and for using violence to make any master alter his mode of carrying on his business. At present, therefore, combinations to wages or limit the hours of labour are perfectly le if unaccompanied by threats or violence; but any attempts at intimidating or preventing masters from employing other workmen, or other workmen from taking employment, at any wages they please, are illegal. Combination has its right side and its wrong: it is right when used as a means of protection, wrong when resorted to for oppression. Strength and skill are to the poor man what stock is to the capitalist, and to hinder him from employing this attength and skill in what manner he thinks proper, without injury to his neighbour, is a plain violation of the most sacred rights of man. "A hundred or a thousand capitalists may form themselves into a company or combination, take all their measures in common, and dispose of their pro perty as they may, in their collective capacity, judge most advantageous for their interests. And why should not a hundred or a thousand labourers be allowed to do the same by their stock? Of all the varieties of property which a man can possess, the faculties of his mind and the powers of his body are most particularly his own. And to fetter him in the mode in which he is to exercise or dispose of these faculties and powers, is a manifest encroachment on the most inviolable of all rights, and can be justified only by an overwhelming necessity."—(J. R. McCulloch.) These remarks, however, apply exclusively to voluntary combinations among workmen, and are not intended to countenance, in the slightest degree, the attempts that are sometimes made by combined workmen forcibly to prevent others from working, except on the terms and conditions they have fixed for their own conduct. The wages of any set of men who enter into combination for the purpose of men who exter anto combination for the purpose of raising them, must be either below the natural and proper rate, or equal to or above that rate. In the first case, then, it would be obviously unjust and oppressive to prevent them from adopting any measures, not injurious to the rights of others, to render their claim effectual. Few masters willingly consent to raise wages, and the claim of one or a few individuals likely to be disregarded, and therefore the second of the claim of is likely to be disregarded; and, therefore, it is only when a number of them combine and act simulta-neously, that their demands are likely to be regarded. The subject of illegal combinations will be further treated under the head of Conspiracy.—Bel. Engiclopædia Britannica.

COMBINATIONS. (See STRIKES.) COMBERTACEE, kom-bre-tail-se-s, in Bot., the Myro-balan fam., a nat. ord. of dicotyledonous plants, in the sub-class Caluciflora. There are 22 genera and about 2:00 species, which are exclusively natives of the tropical parts of America, Africa, and Asia. Trees or shrubs parts of America, Aircs, and Asia. Trees or structs with exstipulate entire leaves without dots, and flowers either perfect or unisexual. In the flower we may remark a superior calyx, with a 4-5-lobed desidaous limb; petals equal in number to, and alternate with, the lobes of the calyx; stamens inserted with the petals on the calyz, generally twice as munerous as the lebes of that part, though sometimes thrice as many, and sometimes equal to them in number. The order is sometimes equal to them in number. The order is remarkable for the presence of an astringent principle, better of these encoments became so apparent that which renders the barks of some species, and the fruits and flowers of others, useful for tanning and dysing. sometimes equal to them in number.

### Combustion

Some gield excellent timber: Conduction politic of Bouth-Rastern Africa, produc regetable wax, which is called dispute to who make use of it to dress their victual MINALIA.)

Countierion, hon-bust shim (Lat. combure, I burn), a term applied to the phenomenon that takes place when shemical action is sufficiently intent to produce light and heat. Gases are sometimes divided into ngue and ness. Cases are sufficiently and the decombination in the idea conversed by such a classification is an erroneous one. Air is, taken to be a supporter of combustion, and hydrogen gas burning in it as a combustible; but if the

nymoren gas burning in it as a combustible; but if the conditions are reversed, we are obliged to alter our classification; for a jet of atmospheric air may be burnt in an atmosphere of hydrogen.

Compusation, Stortambous Human, is a subject that has from time to time given rise to a considerable amount of discussion among its believers and disbellevers. Numerous apparently well-suthenticated cases are given of this nearonance, but the difficulties of are given of this phenomenon; but the difficulties of secounting for the chemical changes involved in such a case mave caused many cumment persons to reject the whole mixther, and contend that none of the cases have been sufficiently well authenticated. On a point where doctors differ so much, we may well refrain from giving an opinion. The cause to which it is usually traced is gross intemperance. The victim is almost invariably a woman, fat, and rarely under 60 years of age. The flame is described as of a bluish colour, obscure in the light, and extinguished with difficulty by water. Some times the body is said to have been consumed so as to crumble to pieces when moved, without the clothes being burned; in other cases the combustion has ex-tended to neighbouring objects. The ashes are always a fatty kind of soot; and a similar greasy matter, of feetid odour, is deposited on objects around.

COMPUTION TUBE, a tube of hard German glass drawn out to a point at one end, and used for calcining organic matter in organic analyses.

COMPUT, kom'e-de, (Gr. kome, a village, and ode, a song), is applied to one of the two kinds of dramatic rooters; and is an annual because analysis. a song, is applied to one of the two kinds of tramater poetry, and is so named because anciently sung at village festivals, by rustic actors. The object of comedy is to expose to censure and ridicule the follies and rices of mankind. It naturally divides itself into two kinds,—comedy of character and comedy of intrigue. In the former the display of some peculiar character is chiefly simed at; and the action is contrived with a view to this end, and is treated as subordinate to it. In the latter the plot or action of the play is made the principal object. The Freuch comedies are chiefly comedies of character, the English mostly comedies of latrigue. In good comedy both characteristics should be properly mixed together. In comedy, the incidents and language approach nearly to those of ordinary life, and the termination of its intrigue is happy. The ancient comedy consisted in direct and avoyed satire against particular known persons, who were brought upon the

Stage by name.

COURT, kom'et (Gr. kometes, from kome, hair), in
Astron., the name given to luminous celestial bodies which occasionally appear in the beavens, consisting of a round body, termed the head, to which a long stream a round hody, termed the head, to which a long stream of light is generally appended, called the tail, which stretches across the heavens for some considerable distance. The head consists, for the most part, of an ill-defined luminous haze, with a bright mass of light in the scatter, called the nucleus, which resembles a star or small planet in apparent size and appearance. The tail is a long train of light, streaming out like hair behind the head, whence the name comet. In some comets, the head is without any nucleus whatever, and others have the luminous head without any tail ap-

### Comet

iumitious tail, slightly curved in shape, which traffs behind the head. They were supposed by the assistent to progressionts some disastrons event, and they were considered to be within the region of the atmosphere that surrounds the sastit. Tycho Bruke proved, however, that they were storted beyond the meth sorbit, and Newton showed that they traveled in elliptical orbits of great eccentricity, the curvature of which did not differ much from that of a parabols. Considering this to be the case, and assuming the path of the comet of 1682 to be parabolic in form, the astronomer Halley calculated its orbit from Newton's observations, and predicted its reappearance about the end of 1755 or calculated its respectance about the end of 1758 are the early part of 1758, making allowances for the disturbing action of the planet Jupiter. Halley's pradiction was verified. When it reappeared, it was first observed on Christmas-day, 1758, by a German astronomer, and it passed its perihelion in Marck, 1758, thus adding to Halley's fame as an astronomer, and confirming the theory that Newton had advanced respecting the revolution of these bodies. This comet, now known as Halley's comet, which had been noticed in 1378, 1458, 1531, 1607, 1632, and 1759, appeared again in 1335, and, assuming seventy-six wars to be the mean in 1378, 1456, 1531, 1607, 1682, and 1759, appeared again in 1355, and, assuming seventy-six years to be the mean time that clapses between its successive appearance at its perihelion, it will be seen again in 1311. A description of the principal comets that are known to return to their perihelion at fixed periods, will be found closewhere (see Bittal's Court, Excest's Courts), as well as an account of the great counct of 1858. Well as an account of the great comet of 1858. [See DONAIT'S COMEN.] The comets of Faye, Because, and D'Arrest, discovered in 1843, 1846, and 1851, respectively, have also reappeared at the time calculated for their return to their perihelion. The large and brilliant comet of 1880, which is supposed to be the one that appeared in the year 44 B.C., just before the death of Julius Casar, and from which Newton derived the data which led him to assert that comets revolved from the sun in elliptic or parabolic orbits, was made round the sun in elliptic or parabolic orbits, was one of the most remarkable that has ever been observed. It presented an appearance of surpassing spleadour; its tail appeared to extend over an arc of 90°, and it approached nearer to the sun than any that have yet been noticed, except the comet of 1843, which is also considered to have surpassed it in magnificence and lustre. It is beyond the bounds of possibility to state how many comets there are revolving round the sup. which is the centre of our solar system; but it may be said that more than two hundred have been observed up to the present time, the orbits of which have been calculated. Of these, about fifty revolve in elliptic orbits, and six at least have been observed as neveral successive appearances at their perihelion. With respect to their dimensions, it was ascertained by micrometric measurement that the great comet of 1811. which is supposed to arrive at its perihelion about once in 3,000 years, had a head 1,270,000 miles in dismeter, with a nucleus in the centre, the diameter of which was about 2,640 miles, and a tail 100,000,000 miles in length. The nucleus of Donati's conset was 800 miles in diameter, while the diameter of the sur-rounding nebulous haze was about 100,000 miles, and the tail, 51,000,000 miles at its greatest length. It is not known of what substance comets consist: but it is evident that, whatever it may be, it must be ex-tremely thin, and without any sensible weight, as stars have been observed shining through comets with un-diminished lustre, which a slight fog would altogether hide from view. Newton considered the nucleus of a hide from view. Newton considered the nucleus of a comet to be a solid body; but no astronomer has ever yet observed the passage of the nucleus of any comet over a star, which would decide the question whether behind the head, whence the name comet. In some comets, the head is without any nucleus whatever, and others have the luminous head without any tail appended to it. The tail is often of great length; that of the comet of 1853, whence it is often of great length; that of the comet of 1852, called Donalt's comet, being about 50,000,000 miles in length, while that of the comet of 1853, one of the most brilliant ever observed, was quite three simes as long. These bodies travel round the sun it is supposed to be formed by a repulsive sun in the path of an ellipse, having the sun as one of the foci, or in a parabolic curve. They are only seem, when they are at their perihelion, and the tail is always the same as the sun. Comets diller considerably the sun as one of the comet of th

# Comfrey

COMPREY. (See STREETSTEE)

COMPREY, tom-ist go (Lat. se, one, or con, with, and see, to go).—Comitium is the piece of meeting, and comitie the people itself, or the assembled meeting. In the Roman constitution the comitie were the ordinary legal meetings or assemblies of the people, and statust from the concions and constitu. Comitie were those assemblies convened by a magistrate for the purpose of putting say, subject to their vote. There were various kinds of comitie:—the comitie calata, which meet on the Capitol in front of the Curia Calabra, where the people assembled acted only a passive part, where the people assembled acted only a passive part. where the people assembled acted only a passive part, historical to what was appounced, and witnessed what was peformed. The comitia curinta, where the people present had to decide by their votes whether the measures brought before them should be adopted or re-jected. The main points to be decided were the elec-tion of the magistrates, including the king himself, the jected. possing of laws, peace and war, and the capital punishment of Roman citizens.—The comitia centuriata, which endeavoured to unite the various elements of which the Roman people consisted into one great political body, in which power and influence were to be deter-mined by property and age. For this purpose Servius Tullius divided the whole body of Roman citizens into x property classes and 193 centuris or votes; from which the assemblies in which the people gave their rotes were called comitia centuriata.—The comitia tributa, which were also called into existence by the constitution of Servius Tullius, who dividence the Roman territory into thirty local tribes. These divisions, which were originally a purely topographical arrange-ment, became in course of time a formidable political power.—Ref. Smith's Dictionary of Greek and Roman Antiquities.

COMITY OF NATIONS, kom'e-te (Lat. comitas gentium, courtes of nations), is a phrase expressing the true toundation of the recognition and effect sometimes given to the laws and institutions of one country within the territories of another. It is derived altogether from the voluntary consent of the latter, and is inadmissible when contrary to its known policy or prejudicial to its interests. In the silence of any positive rule, affirming, denying, or restraining the operation of foreign laws, courts of justice presume the tacit adoption of them by their own government, unless they are repugnant to its policy or prejudicial to its interests.—Ref. Story's Conflict of Lusse.

COMMA, kom-mi, in Punctuation, is a mark thus ()

used to separate those parts of a sentence which, though very closely connected in sense and construction, require a pause between them. It represents the shortest pause in a sentence. (See Punctuation.)

COMMANDER, kom-man'-der (Fr.), the term employed

to designate an officer in the royal navy who holds

COMMANDER-IN-CHIEF, the designation of the generai officer who has the control of the entire military force of Great Britain and Ireland. He generally holds the rank of field-marshal. His head-quarters, whence all orders emanate, are at the Horse Guards, Whitehall. The office is held at present (1862) by H.R.H. the duke of Cambridge.

COMMANDERY, kom-man'-der-e, in the Middle Ages, was a kind of benefice or fixed revenue attached to certain orders of chivalry, and conferred upon aged knights who had rendered worthy services to the order or the state. Commanderies were of different kinds mong the different orders; and, after the system of nefices was abolished, the title was still retained, and conferred as an honorary dignity, as in the present day the second rank of the order of knights of the Bath are termed knights commanders. At the time of the suppression of the religious houses under Henry VIII, there were at least filty commanderies, or preceptories, as they were often called, in England.

Commander (Rr.) is a kind of commercial society or partnership, in which one or more of the members constribute a pertnership, in which one or more of the members constribute a pertain amount of capital without taking constrouse a corcast amount or capital without taking any part is the management, becoming what we call eleping partners. Such partners are called in France commandates; or partners in commandite, and are held liable for lossed only to the extent of the funds or capital farmished by them. 536

# Commerce

COMMENTACER, com-mel-s not-se-s (after J G. Commelin, colebrated Dutch betweensts), in to Commelin, celebrated Dutch betenists), in 18st, the Spider-wort fam., a nat. ord. of monocotyledonous plants, in the sub-cise Petuloiden. There are sixteen geners, which include 260 species, chiefly natives of India, Africa, Australia, and the West Indias. They have flattesed, narrow, and usually sheathing leaves. The perianth is inferior, more or less irregular, in six parts, arranged in two whorls; the outer parts being green, persistent, and opposite to the carnels. The green, persistent, and opposite to the carpels; the inner petaloid. There are six or three stamens by: gynous, some being generally abortive: their proper-ties are unimportant. The rhizomes of some species, as Commetyna tuberosa, angustifolia, and striato, con-tuin much starch, and in a cooked state are edible. Some species have been reputed astringent and rulnerary, and others emmenagogue.

COMMENDAM, kom-men'-dam (Lat.), in Eccl. Law, was originally applied to a benefice which, during voidance, was committed to the care of a person who discharged the spiritual duties, but had nothing to do with the emoluments. Such a person was said to hold it in commendam. In time, however, the restriction as to interfering with the profits came to be evaded; and this came to be adopted as a mode of enjoying pluralities. By the law of England no benefice could be held in commendam without a license from the crown; and sometimes elergymen promoted to bishopries wan an-sulficient revenues were allowed in this way to retain their benefices; but by 6 & 7 Will, IV. c. 77, it is pro-vided that no ecclesiasteal dignity, office, or benefice shall be held in commendam by any bishop unless he shall have held the same when the act passed. sometimes clergymen promoted to bishoprics with in-

COMMENTARY, kom'-men-tur-e (Lat. comminiscor, I call to mind), is a term used in literature in various significations. Originally it was applied to remarks or memoranda made on events and occurrences as they happened; as the Commentaries of Casar. At present it is usually applied to a series of critical notes and observations upon a book, either in the form of detached notes, or as a connected series of remarks, other-

wise called a running commentary.

COMMERCE, kom'-mers, is derived from the Lat. commutatio mercium, and, in its most general sense, denotes the exchange of articles of any kind for money or other articles. The origin of commerce is coeval with the articles. The origin of commerce is coveral with the termation of society, and at first must necessarily have been carried on by barter. Individuals having more of any article than they required would endeavour to find out others in want of it, and, at the same time, possessing something which they would like to have. As the population of a place increased, commerce necessarily became more extended, and various facilities for currying it on would be introduced. In the transaction between Abraham and Enheron, we read transaction between Abraham and Ephron, we read that the former paid to the latter "four hundred shekels of silver current money with the merchant" for the cave of Machpelah; and Joseph was sold to a company of Ishmacitish merchantmen travelling to Egypt with spices and myrrh, for twenty pieces of silver. These are the earliest written notices that we possess of commercial infercourse, and they show that, even at that early period, it was in an advanced state. The Phoe nicians were, however, the first nation of antiquity that seem to have devoted themselves in any great degree to commercial pursuits, and they were the first that made any great progress in navigation. They are mentioned as great traders in Genesis and in Homer; and in the 6th century n.c. their commerce embraced the entire known world, from India and Eastern Africa, on the one side, to Western Africa and Northern Europe on the other. The city of Tree was than the defining of Tree was then the defining of the city of Tree was then the defining of the city of Tree was then the defining of the city of Tree was then the defining of the city of Tree was then the defining of the city of Tree was then the defining of the city of the cit on the other. The city of Tyre was then the com-mercial mart of the world. The Carthaginians were nerval mart of the world. The Cartangians were Phoenicians by origin, and their commerce was of the most wide-spread character, especially after the destruction of Tyre. The Greeks, too, at an early period, showed considerable skill in commerce, and some of their states found in it the source of much opulence. their states found in it the source of mass optilence.
Athens was the chief commercial city of Greece, and
was as distinguished for trade as it was for art and
letters. In navigation the Romans at no time were
remarkable; but after the fall of the Roman empire
there sprang up in the north of Italy certain cities
that for several centuries kept in their bands the commerce of the world. The chief of these were Venice,

Pice, and Genos, though several others rose to son-siderable importance. In the latter part of the 15th century, Venetian commerce was co-extensive with the then known world. About the middle of the 18th century there was formed in the north of Europe an association of commercial towns that occupies an important place in commercial history. This was what is termed the Hanscatio League, and it originated at Lubeck. At first it consisted of Lubeck, Hamburg, and Brunswick; but afterwards came to include up-wards of sixty towns; among which were Dantzic, wards of sixty towns; among which were Dantzle, Stettin, Königsberg, Riga, Amsterdam, Cologue, &c. This body continued in a state of union for three centuries, after which it was gradually dissolved, the only remains of it that still exist being Hamburg, Dubeck, and Bremen. The maritime enterprises of Portugal began about the commencement of the 15th centery; while the discovery of America, at a later period, placed Spain in the first rank among maritime In the 16th and 17th centuries the lead in nations. commerce was taken in a remarkable degree by the Dutch, and in the 18th by the English. The trade and navigation of England, unexampled as it now is for extent, did not by any means make an early figure in the commercial history of Europe. This is principally to be attributed to the political struggles in which she was from time to time engaged; and it was not till after the close of the 17th century, when the country had become settled, that she began to make those great strides in commercial progress that speedily brought her to the first place. Her home industry has fed her commerce, and each has contributed to raise her to her present state of greatness. Our limits do not admit of our considering in detail this remarkable progress; but we shall attempt to give some of the more prominent features. In the beginning of the 18th century the mercantile navy of England amounted to 270,000 tons; in the middle it exceeded 600,000; and in the end it approached 1,600,000 tons; while, in 1860, the total number of vessels belonging to Great Britain and her colonies was 38,501, and their tonnage amounted to 5,710,908 tons, of which 2,337 vessels and 500,144 tons were steam. A like surprising increase hus taken place in our manufactures since the middle of the last century, occasioned in great measure by the discoveries of Arkwright, Watt, and others. The war with America, which terminated in the peace of 1783, exercised for the time an injurious effect upon our commerce; but after the peace it rapidly increased. In 1786 a commercial treaty with France was concluded, which, however, was put an end to by the war of 1793. For the first few years of the war, its injurious effects upon our trade were very manifest; but the extended circulation of bank paper in 1797 seemed for the time to bring a yearly addition to our national wealth, and this bring a yearly addition to curnational weatin, and this delusive state of matters continued during the greater part of the war. Its effects, however, began to be felt as soon as peace was concluded, and the sufferings of the succeeding twenty years were mainly owing to this circumstance. The year 1816 was among the most gloomy in our commercial history. In 1817 and 1818 a slight revival took place, but it was succeeded by a long depression. In 1822 various relaxations were made in our navigation laws, and, in 1823, trade again resived. Since that time our commercial becomes in Since that time our commercial prosperity has rapidly increased, notwithstanding several inter-ruptions that have taken place, as in 1825, 1847, and 1858. In 1845 Sir Robert Peel abolished the customs duties on 420 different articles, a measure which was followed shortly after by the total repeal of the corn laws. These measures were followed by the repeal of laws. These measures were followed by the repeal of the navigation laws in 1850. Since that time the policy pursued by the government has been more and more to withdraw the restrictions on commerce, particularly in the way of simplifying the tariff, and cutting of a number of articles that produced little revenue to the state. (See TRIFF.) The recent commercial treaty with France will doubtless have a very beneficial state of the transport of the product of the state o treaty with France will doubtless have a very beneficial active matters.

a time in operation to enable one to judge, with any dagree of accuracy, as to its results. There are three tinds of commerce:—I. Home trude, or that carried on between individuals of the same country; 2. foreign trade, or that carried on parchiment, and addressed to the officer who have that carried on between the inhabitants of the same countries; and 3. colonial trade, or that farried countries; and 3. colonial trade, or that carried to the said commission," which he is called on to dis-

carried on between the inhabitants of any particular country, and its colonists. It is impossible to form an estimate of that amount or value of the form trade of this country; but in 1886 the real value of the exports to foreign countries, of British foreign, and colonial produce, was £238,806,809.14 British possessions, £198,927,785: and the imports in the same year, into the United Kingdom from foreign countries was £298,093,503, and from British possessions, £72,206,838. It would be difficult to overstimate the advantages of commerce to the individual estimate the advantages of commerce to the individual or to society. Without commerce, man could in few or to society. Without commerce, man could in few positions supply himself with more than a few of the necessaries of life; by means of it, all parts of the world come to minister to his enjoyment; and he beworld come to minister to his enjoyment; and he be-comes in reality a "citizen of the world." In the worlds of Addison, by means of commerce, "our tables are stored with spices, and oils, and wines; our rooms are filled with pyramids of China, and adorned with the workmanship of Japan; our morning's draught comes to us from the remotest corners of the earth; wo repair our bodies by the drugs of America, and repose ourselves under Indian canopies." "The vineyards of France are our gardens, the Spice Islands our hotbeds, the Persians our silk-weavers, and the Chinese our potters." Commerce distributes the gifts of nature, potters." balancing the deficiencies of one country with what is balancing the denciencies of one country what is superfluous in another; creates a demand for labour; finds employment for wealth; and multiplies end cheapens the productions of every country. In a commercial point of view, the whole world is, or ought to be, regarded as one people,—one nation, and their intercourse as free and unrestricted as possible. The loss of a trade with one nation is so much of the trade of the wealt greening and both. of the world rescinded and lost.

COMMINATION, kom-min-ai'-shun (Lat. comminatio), is a threat or denunciation of vengeance. In the Liturgy of the Church of England it is an office appointed to be read on the first day of Lent, or Ash-Wednesday, in room of the ceremony in the Church of Bone of apprinking ashes on the head on that day. It is ensured the control of the ceremony in the Church of Bone of the Church of the Church of Bone of the Church of sprinking askes on the head on that day. Its en-titled "A commination or denouncing of God's anger and judgment against sinners;" and may be used "at other times, as the ordinary shall direct." COMMISSAHAT, kom-mis-sail-rad, a term taken from an old French word, and applied to a body of men

under the immediate command of a commissary-general or assistant commissary-general, who are at-tached to an army in the field, for the purpose of providing the necessary stores and provisions for the

soldiers. COMMISSARY, kom'-mis-nir-e (Fr. commissaire), one who is appointed or commissioned to execute some duty on behalf of another. The commissary of a bishop is an officer delegated by him to hold an inquiry or commissarial court in some distant part of the chooses; his powers are similar to those of the chancellor of the diocese, who sits in the consisterial court. In Mil. the term is applied to officers holding various positions, and oxercising different offices. There is a commissary general, who is the chief of the commissariat depart. ment, and commissaries, who inspect the muster-rolls returned by the commanding officers of regiments, and make periodical reports of the numerical strength of the army; there are also others who have to inspect the horses used by the cavalry and artillery, and who have charge of the stores under the control of the

Roard of Ordnance. COMMISSARY COURT, in Scotland, was a court estab-lished in Edinburgh, at the time of the Reformation, for the trial of such cases as had formerly come within ior the trial of such cases as had formerly come within the jurisdiction of the bishops. Its powers were from time to time diminished, until it was entirely abelished in 1836, and its powers transferred to the Court of Session. At present there is what is called a commissary court in each county, of which the sheriff is commissary; but its jurisdiction is limited to decreaing and confirming executors to deceased persons and

# Commission

charge, in virtue of the rank he holds in the regiment or corps to which he is appointed. Commissions of efficiers in the army are signed by the queen; those of officers in the army are signed by the queen; those of officers in the rary, by the first lord of the Admiralty; and those of volunteer officers, by the lord-lieutenant of the county in which the corps to which they belong have been raised. In the taxy, engineers, artillery, and marines, officers obtain their commissions without purchase; but in the cavalry and infantry, gentlemen obtain commissions as ensigns and cornets by purchase, and ries to higher grades successively, by paying the difference between the price of the commission of the rank they are about to enter, and that of the rank they are about to enter, and that of the rank they are about to enter, and that of the rank they are about to enter, and that of the rank they are about to enter, and that of the rank they are adout to enter, and that of the rank they are about to leave. Commissions are sometimes given as rewards to meritorious officers, and considerable time, with honour and distinction. Cadets who have studied and passed at Sandhurst also obtain commissions without purchase, and the commander-in-chief can grant the same to some of deceased officers, or in any case which appears to him to require it. Of the undermentioned commissioned officers in the army, the colonel, lieutenant, engineerial officers; and the chaplain, adjutant, quartermaster, and surgeon, staff officers. The prices of commissions in various branches of the army are as follows:—

Rank. Foot-Grds.	Life (1) & H. Guards (2).	Drags.	Inf.
Lieut Colonel £9,000	£7,250	£6,175	£4,500
Major 8,300	5,350	4,575	3,200
Captain 4,800	3,500	3,225	1,800
Lieutenant 2,050	$\{1,785 (1) \}$ $\{1,600 (2) \}$	1,190	1,100
Cornet, or 1,200	$\{ \substack{1,269\ (1)\ 1,200\ (2)} \}$	840	450

Every particular with regard to the full-pay and halfpay of officers of all grades in the army, navy, and marines, will be found in Hart's Army List, and Marray's Navy List.

Conjussion, the warrant or letters patent which all men exercising jurisdiction, either ordinary or extraordinary, have to authorize them to inquire into, hear, or determine any cause, action, or matter; as the consistion of the judges, justices of the peace, &c.—Commission of the judges, justices of the peace, &c.—Commission of Lunacy, a commission issued out of Chancery to inquire whether a person represented to be a lunatic be so or not.—Commission of the Peace. Justices of the peace are appointed by the queen's special commission under the great seal, the form of which was settled by all the judges in 1590: this appoints them all jointly and separately to keep the peace, and any two or more of them to inquire of and determine felonies and other misdemeanours. Stipendiary magistrates, specially appointed for the metropolitan and other districts, have the power to act singly, and with the same jurisdiction and power as two or more justices of the neace.

Convisionable, kom-mis-thun-air' (Fr. commistionsire, one who is appointed to execute some office),
the name given to the members of a corps who have
been enrolled since the termination of the Crimean
was, to furnish the public with trustworthy messengers
who will execute any commission on receipt of a cortain sum fixed as a remuneration for their services.
Most of them have served in the army, and are incapacitated, for other employment by the loss of an arm
or a legisThey wear a military dress of dark green,
with a black leather waist-belt, cross-belt, and ponch.
The corps possesses an excellent band. Their barracks
are in Exchange-court, Strand, but there are stations
in many of the great thoroughfares, where they may be
found waiting for employment.

Cormissues for mish'-are (Lat. commissura, a joining

Correspond to temporal the commission as joining together; is a joint or seam, the place where two hodies or parts of a body meet and unite. (See

Committee, kom-mil'-te (Fr. comité), a certain number of persons elected or appointed from a more numerous body to perform some special act or investiration. Although a committee does not usually consist of less than three members, it may be formed of one and member only. On the other hand, the whole of 538

### Common

the members of a body may be resolved into a committee; as, for instance, when all the members of the House of Commons form themselves into a "committee of the whole house." When this latter proceeding takes place, the speaker vacates the chair, being superseded by a paid official, denominated the chairman of committee. In a similar way the chancellor of the House of Lords leaves the chair, which is then occupied by the chairman of committee of the upper house of the legislature. (See Parliament)

house of the legislature. (See Parliament.)
Committee or Public Safety (Fr. Comité de Malus publique) was the term applied to a number of members of the National Convention during the reign of terror, 1793-4, who acted as the dictators of Frayes. The committee arose out of that section of the Convention called the "Mountain," which had gained the victory over the Gironde party; and at length its power came to be concentrated in three of its members.—Robespierre, the real chief, though half-concealed from view, Couthon, and St. Just. Among these men there was perfect equanimity down to the moment of their fall; and there is reason to believe that they had resolved to perpetuate their power by that they had resolved to perpetuate their power by establishing a supreme council of three consuls, in which Robespierre would have had the perpotual presidency, with the departments of justice, exterior, and finance; Couthon that of the interior, and St. Just the war department. The career of this sanguinary tribunal was brought to a termination by some of their former associates unpeaching its members before the Convention; and a reaction having taken place in the public mind, Robespierre, Couthon, and St. Just were executed on the 5th Thermidor (July 28, 1794).—

Ref. Cartyle's French Revolution.

COMMITMENT, kom-mit'-ment (Lat. committo, I commit). is the ordering into custody an offender, or supposed offender, in order that he may be committed to prison to answer the offence. For criminal offences he may be arrested by,—1. warrant; 2. by an officer without warrant; 3. by a private person, also without warrant; 4. by hue and cry. In either case he must be taken before a magistrate to be dealt with, who, upon sufficient cause, issues his warrant of committal. A committal may also be made by a court of record for contempt for not obeying its order (in cases where a judgment cannot be entered) to pay costs, a fine, or other moneys, or otherwise in disobeying its mandate, Or it may be by the court ordering a person into the court, in the body of the court or its precincts, abasing its process and otherwise, or for not patting in bail in cases where bail is requisite. And cach of the houses of parliament may, by warrant, commit a person for contempt of its power or authority, or a breach of its privileges.

COMNUDER, kom-mo-dore' (Span. commendador, a commander), the designation of an officer in the navy who has the command of a small number of ships separated from the fleet for any special service. The office is held by a captain, who ranks with a brigadier-general in the army. There are two classes of commodores in our navy: those of the first class carry a red pendant, broad and swallow-tailed, at the mast-head; those of the second, a blue pendant. Commodores rank in the navy next to a rear-admiral.

COMMON, kom'-mon (Lat. communis, Fr. commun), or right of common, is an incorporeal hereditament, and a profit which a man has in the land of another; as, to feed his beasts, to catch fish, to dig turf, to cut wood, or the like. It derives its name from the community of interest which thence arises between the claimant and the owner of the soil, or between the claimant and other commoners entitled to the same right, all which persons are entitled to bring actions for injuries done to their respective interests; and both as against strangers and against each other. Common is chiefly of four sorts:—A. Common of pasture.—This is the right of feeding one's beasts in another's land, and it is either appendant, appurtenant, because of vicinage, or is gross. Common of pasture appendant is the privilege belonging to the owners or occupiers of arable land held of a manor, to put upon the wastes of the manor (thence called commons) their commonsible beasts; that is, such beasts as are necessary either for the ploughing of land or for its manuring; viz, horses and ozen, cows and

### Commonalty

b. It can be claimed only in respect of arable though it may be claimed by that name as appendant to a farm in fact containing pasture at the present day, for the land shall be presumed (where there is usage to sustain the claim) to have been all originally arable. Common appartenant (which is all to be frequently confounded with common appendant) so be frequency contounded with common appendent) arises from no connection of tenure, nor from any absolute necessity, but may be annexed to lands in other lordships, or extend to other beasts besides such as are concraity commonable: as hogs, goats, geese, or the like. It can only be claimed by grant, or by the long usage of particular persons to enjoy the same; which latter title is commonly called a title by prescription, and is supposed by the law to be founded on a special grant or a greement originally made for this purpose, Common because of vicinage, or neighbourhood, is where the inhabitants of two townships which lie contiguous to each other have usually intercommoned th one another, the beasts of the one straying naturally into the others' fields without any molestation from either. Common in gross, or at large, is such as is neither appendant nor appurtenant to land, but is annexed to a mansion, being granted to a man and his heirs by deed; or it may be claimed by prescriptive right, as by a parson of a church, or the like corporation sole. This is a separate inheritance, entirely distinct from any other landed property vested in the person to whom the common right belongs. 2, 3. Common of piscary is a liberty of fishing in another man's water, as common of turbary is a liberty of digging turf upon another man's ground. There is also a common of digging for coals, minerals, stones, or the like. Common of turbary may be by grant or prescription, and may be either appurement or in gross. A common of turbary cannot be claimed as appurement to land, but only to a house, and does not authorize the taking of turf, except for the purpose of using it as feel in the particular house to which the claim of the control of the purpose of the pu right is anuexed. Common of estovers or estouviers, that is, necessaries (from esloffer, to furnish), is a liberty of taking necessary wood, for the use or fur-niture of a house or farm, from oil another man's estate. (See BOTH.)

COMMONALTY, kom'-mon-al-te, is the lower of the two divisions of the civil state, the nobility being the other. Like the latter, it includes several degrees of rank and

condition.

condition.

Common Bench. (See Court.)

Common Council, is the council of a city or corporate town, empowered to make bylaws for the government of the citizens. The common council of London consists of two houses,—the upper house, composed of the lord mayor and aldermen; and the lower house, of the common conneilmen, elected by the several wards. The members of the common council are elected annually by the ratepayers of the different

COMMONER, kom'-mon-er, is a student of the second rank at the universities of Oxford and Cambridge.

COMMON LAW.—The common law is grounded on the general customs of the realm, and includes in it the law of nature, the law of God, the principles and maxims of the law, and the decisions of the superior courts, which are founded thereon; and is said to be the perfection of reason, acquired by long study, observation, and experience, and refined by learned men in all ages. It overrides the canon and civil law, where all ages. It overrides the canon and civil law, where they go beyond, or are inconsistent with it, as we have ady noted in considering those subject

already noted in considering those subjects.

Common-Place Book, is a book in which are recorded and arranged under general heads such things
as may occur in the course of reading or study, in such
a way as that they may be easily found again. The
advantage of such a book to the student or man of letters is very great. It not only trains him to read with accuracy and attention, but leads him insensibly to think for himself, and to watch over his own thoughts, To most reflective men there occur at times valuable thoughts, which, without some such way of preserving them, are generally lost. The method of arrangement adopted in a common-place book is of some importance, and various plans have been proposed, each having its dvantages. The best is, perhaps, that which is given by Mr. Locke, and which, from twenty years' experi-

# Common-place Book

ence, he found of the greatest advantage. The method recommended by him is briefly as follows:—The first page, or, for more room, the first two pages that fronteach other, are to be made to serve as an index to the book, and to contain references to every pince or matter therein. These are divided by parallel lines into twenty-five equal parts, whereof every fifth line is to be distinguished by its colour, or some other circumstance. These lines are to be out perpendicularly by others drawn from top to bottom, and in the several spaces thereof the several letters of the aiphabet, botta capital and minuscule, are to be written. The manner capital and minuscule, are to be written. The manner in which this is done may be best seen from the following example of the first four letters :

A	a	О	a
	•		e
	i		<b>i</b> (1)
	0		0
	и		u
в	а		æ
	в		в
	i	D	<b>i</b>
	0		0
	u		u

Having fixed upon the head to which the thing to be entered may be most naturally referred, we regard first the initial letter, and then the first vowel that follows it. For instance, in Beauty, B is the initial letter and e the first vowel; we look in the index for the partition B and the line e, which is the place for all words whose first letter is B and first vowel e; and finding no numbers already down to direct us to any page of the book. we turn forward to the first blank page, which, in the case of a new book, will be page 2, and there write what we have occasion for on the head of heauty; beginning the head in the margin and indenting all the other sub sequent lines, that the head may stand out. This done, we cuter the page in which it is written, viz. 2, in the index, in the space B e, from which time all subjects under the head Be come into the second and third pages. The Index Rerum of the Rev. Dr. Todd differs from the common-place book of Locke, in being intended rather as an index to subjects that occur in the course of one's reading than a common-place book. Instead of the passage being copied out in full, the substance of it is given, and the book and page referred to. instructions that he lays down are-1. To have the index constantly at hand when you read; and when you meet with anything of interest, just note it down,the subject, the book, and the page, and any word designating its qualities. 2. Make your index according to the subjects as much as possible, selecting that word which best conveys the idea of the subject. wide margin is to contain the word selected as a guide to the subject, and noted down on the corners of the page are the letters of the alphabet (capitals), and in the centre the first five vowels, a, e, i, a, u; each letter of the alphabet having two pages to each of the vowels, and consequently each letter having ten pages. when you read anything which you may hereafter need, place the principal word in the margin under the first letter in that word and the first wowel in it. For students and literary men, this system is preferable to that of Looke. The following are a few of the examples given :-

Atheism.

Bradford.

V. z. p. 108.
Governor, notice of. Am. Quart. Bet.
v. 3, p. 487.
Graphic and powerful description of. Bert.
Rhet. Reader, p. 487. Brougham.

America.

Supposed to be known in the time of Homer. Thomas Hist. Print. v. 1, p. 21, of France, picture of. Schlegel's Lect. v. 2, p. 199.

# Common Pleas

COMMON PLEAS. (See Count.)
COMMON PRAYER. (See LITTERY.)
COMMON SERSE PRILOSOFHY is a term employed to
designate a certain system of philosophy which professes to accept the testimony of our faculties as trustworthy within their respective spheres. The results of Bishop Berkeley's philosophical speculations led him to the conclusion that there was no such thing as a material world—nothing in nature but spirits and ideas; material world—nothing in nature but spirits and ideas; and that the belief in material substances and of abstract ideas is the chief cause of all our errors in philosophy, and of all infidelity and heresy in religion. Hume proceeded upon the same principles, but carried them to their full length, and as the bishop undid the whole material world, Hume, upon the same grounds, undid the world of spirits, and left nothing in nature libit ideas and impressions, without any subject on which but ideas and impressions, without any subject on which they might be impressed. Then appeared Dr. Thomas Reid with his philosophy of common sense. "I observe," he says, "that as the Peripatetic system has a serve," he says, "that as the reripatent system has a tendency to materialize the mind and its operations, so the Cartesian has a tendency to spiritualize body and its qualities. One error, common to both systems, leads to the first of these extremes in the way of analogy, and to the last in the way of reflection. The error I and to the last in the way of reflection. The error I mean is that we can know nothing about body or its qualities but as far as we have sensations which resemble those qualities. Both systems agreed in this; but, according to their different methods of reasoning, they drew very different conclusions from it; the Peripatetic drawing his notions of sensation from the qualities of body, the Cartesian, on the contrary, drawing his notions of the qualities of body from his sensations. The way to avoid both these extremes is to admit the existence of what we see and feel as a first principle, as existence of what we see and feel as a first principle, as well as the existence of things whereof we are conscious; and to take our notions of the qualities of body from the testimony of our senses with the Peripatetics, and our notions of our sensations from the testimony of consciousness with the Cartesians." The philosophy of common sense has been ably vindicated by the late Sir William Hamilton, in one of his notes appended to his edition of Reid's works. He maintains that his edition of Reid's works. He maintains that the end of all philosophy is truth, and consciousness is the instrument and criterion of its acquisition; that philosophy is thus wholly dependent upon consciousness; that consciousness is to be presumed trustworthy until proved mendacious; that no attempt to show that the data of consciousness are (either in themselves or their necessary consequences) mutually contradictory has yet succeeded; and the presumption in favour of the truth of consciousness, and the possibility of philosophy, has therefore never been redargued. "Nature is not gratuitously to be assumed to work not only is not gratuitously to be assumed to work not only in vain, but in contradiction of herself; our faculty of knowledge is not without ground to be supposed an instrument of illusion; man, unless the melancholy fact be proved, is not to be held organized for the attainment, and actuated by the love of truth, only to become the dupe and victim of a perfidious creator."

become the dupe and victim of a perfidious creator."

—Sir W. Hamilton.
COMMON TIME, in Mus. (See TIME.)
COMMONS, HOUSE OF. (See PARLIAMENT.)

—NOMMONWEALTH OF ENGLAND, kom'-mon-welth, was that form of government established in England on the death of Charles I. in 1649, and which existed during the protectorate of Oliver Cromwell and his new Richam with the abdication of the Inter and the restoration. Immonarchy again in the person of Charles II. 11459.

COMMUNIX, kom'-mune, in France, is a subordinate

COMMUNE, komi-mune, in France, is a subordinate territorial subdivision of the country, less than a canton, and corresponding in some measure to an English parish. A commune includes sometimes a single town,

# Company

hence a person is said to be in communiou with a church who declares his acquiescence in its doctrines and participates in its worship. Different churches, too, are said to be in communion when they are maked in doctrine and discipline. Communion is applied in m nourme and discipline. Communion is applied; in a more limited sense, to participation in the secrement of the Eucharist or Lord's Supper. (See Euchalize Communion denotes that all who have been baptized, either in infancy or adult age, may, on a credible profession of their faith, sit down at the Lord's table with others of different denominations. Strict communion, on the contrary is confined as Strict communion, on the contrary, is confined to a particular denomination. Communion service is the office in the Liturgy of the Church of England for the administration of the Eucharist. Communion clements are the bread and wine employed in the Eucharist.

COMMUNISM. (See SOCIALISM.)
COMMUNISM. (See SITHES.)
COMMUNISM. kom-pan'-yan (Fr. compagnon), a kind of wooden porch placed over the entrance to the master's cabin in merchant-vessels.

COMPANION-LADDER, a ladder used in men-of-war, by means of which the officers ascend to or descend

from the quarter-deck.

COMPANY, kum'-pane (Fr. compagnie), an association of merchants, mechanics, or other traders, joined together for one common interest. In all municipal corporations the mechanics are united into companies, with privileges and large immunities bestowed on them by royal charter. Their original object was the pro-tection and advancement of trade. Their powers have been considerably restricted in late years. The term company is more particularly appropriated to those large associations set on foot for the purpose of carrying on some industrious or commercial undertaking. ing on some industrious or commercial undertaking. Companies, in this seuse, are generally divided into two great classes,—regulated companies and joint-stock companies. In open or regulated companies, the affairs are managed by directors appointed by the members; but there is no joint stock. Any person properly qualified can be admitted as a member if he pays a fine and agrees to submit to the regulations of the company, and each member trades upon his own stock and at his own risk. The regulated companies formerly existing in this country resembled the corponormerly existing in this country resembled the corporations of trades, and were a sort of enlarged monopolies. They now exist only in name, and do not maintain a monopoly in any branch of trade. Exclusive, or joint-stock companies, differ not only from regulated companies, but from private copartnerabips. An institution of this sert is a company, having a certain amount of capital divided into a small or great number of transferable shares, manged, for the common advantage of the shareholders, he a hody of directors advantage of the shareholders, by a body of directors chosen by and responsible to them. The South-Sea Company and the East-India Company are two of the largest institutions of this kind which have been organized in Great Britain. The former arose out of the inability of the government to pay the sailors of the royal navy during the long war with France in the royal navy during the long war with france in the reign of Queen Anne. The tickets with which the sailors were paid fell into the hands of usurers, and the nation found itself indebted £9,471,321, and no means provided for paying it by parliament. The chancellor of the Exchequer, Harley, afterwards earl of Oxford, proposed a scheme by which he allowed the proprietors proposed a scene by which he showed the proposedra of these debts 6 per cent. per snuum, and incorporated them for the purpose of carrying on a trade to the South Sen. The fatal South-Ses bubble scheme was projected in 1720, and was executed upon the statute 6 George I., wherein it was declared that the company wight redeem all or now of the redeemable neticual might redeem all or any of the redeemable national debts. Its pretence was that of raising a fund for carrying on a trade to the South Sea, and purchasing carrying on a trade to the South Sea, and purchasing and sometimes several villages, and each has a mayor annotation and a communal municipality. There are upwards of 37,980 communes in France.

Communicating, kom-mu'-ne-kai-ting, in Theol., is the act of receiving the sacrament of the Eucharist. (See Eugarist.)

Communion, kom-mu'-ne-on (Lat. communto, mutual participation), in a general sense, denotes fellowship or intercourse between two or more persons. In sold for £300. In three months' time it fell to £150, Theol. it is fellowship with an particular church; and sold for £300. In three months' time it fell to £150, Theol. it is fellowship with an particular church; and

ful scenes of wretchedness and distress resulted, and all the directors were severely fined, and many lost their untire property. This did not, however, interfere with the Seuth-Sea Company, which, in the year 1722, had a capital of £33,800,000. In 1748 the whole of their trading stock was converted into an annuity stock, and the company ceased in every respect to be a trading community. The East-India Company was formed under a charter granted for fifteen years by Queen Elizabeth, in 1600, under the title of "The Governor and Company of Merchants of London trading to the East Indies." The charter was exclusive, prohibiting the rest of the community from trading within the the directors were severely fined, and many lost their East Indies." The charter was exclusive, prohibiting the rest of the community from tracing within the limits of the company, which comprised the whole space, including both land and sea, between Cape Hora and the Cape of Good Hope. Ships were soon sent out by the company to Sumatra and Java, which returned with cargoes of calico, silk, indigo, &c.; and about 1612 they obtained leave from the native rulers to establish factories at Surat, Ahmedabad, Cambay, and Care. The two of Surat was considered the The town of Surat was considered the principal British station in the west of India, till the was frequently renewed, and their stations and fac-tories increased in number. The station and fac-tories increased in number. The station at Madras was established in 1640, that of Calcutta in 1645, and that of Bombay in 1665. By a statute of Charles II. they were empowered to make war and peace on the native princes, and for nearly two hundred years they native princes, and for nearly two hundred years they took advantage of this privilege. A new East-India Company was formed in 1698, to whom the crown granted a charter, because they offered a loan of 22,000,000 to the state. The two companies could not agree, so they amalgamated, and formed one company, under an act of parliament passed in 1702. As long as the company existed, the constitution, as then formed, remained almost the same. Every shareholder who held £500 of the company's stock became a member of the Court of Proprietors. This court chose from their number twenty-four directors, each of whom held not less than £2,000 of the stock. The Board of Control, which was afterwards formed, had reference to the affairs of Indian government. The members of the East-India Company were, properly speaking, merchants exporting home produce and importing silk, calico, diamonds, spices, &c., from thence. Gradually, they began to interfere in the quarrels of native princes, and, in time, began to gain an influence which amounted to sovereign power over vast portions of territory. From this period they over vast portions of territory. From this period they could not obtain a renewal of their charter without a loan to government, and in 1835 their trading privi-leges were taken away. Their dividends had to be paid by means of taxes levied on the people of India. The wars that have occurred since that time have been waged by this country as a nation, and not by the company. The last charter would have remained in company. The last charter would have remained in force until 1873, had it not been for the Sepoy rebelion in 1857. Notwithstanding a vigorous resistance, the company were then compelled to give up their powers, and it was resolved that the management of India should be concentrated in the hands of the British government. In 1858, the whole of the company's powers were transferred to the crown. The East-India Company is still in existence, but solely for the purpose of receiving and paying dividends. The Hudson's Bay Company is another institution of the same kind, but smaller. They received their charter in 1670, for the exclusive right to trade in the vast territories which surround Hudson's Bay. They erected several forts on the western side of the bay, which were taken and destroyed by the French in bay, which were taken and destroyed by the French in 1782. For a considerable period, this company carried on a lucrative trade in the skins and furs of animals, which were found in great abundance in these districts, and were of much finer quality than those found it less and were of much nner quality than those found these bortherly countries. On the formation of the North-West Company, they met with serious rivals; and when Lord Selkirk became a partner in the Hudson's Bay Company, many scenes of violent and sanguiarry contest took place between the servants of the two parties. In 1821 these disputes were settled by a conlition of the two companies, and the extensive fur trade was carried on with their united capital. At the

to large institutions, such as the Bank of England, railway companies, &c., where the operations are quaducted by means of agents acting under the orders of a board of directors.

COMPANY, in Mil., is the ordinary term given to a body of men in the guards, the line, or the marines, under the command of a captain. In the cavalry a captain's command is called a troop; in the artillery, a battery. The strength of a troop of cavalry and of a company in the line is eighty men of all ranks; of a battery of artillery, 120. In the volunteers, the minimum strength of a company is sixty men of all ranks, and the maximum, 100. A company is divided into subdivisions, and each subdivision into two sections. subdivisions, and each subdivision into two sections.

A sergeant and corporal are allowed to each section, and a fifth sergeant acts as captain's covering sergeant.
The first mention made in history of the division of
an English regiment into companies under a captain, lieutenant, and ensign, is at the battle of St. Quentin in 1557, when the French were defeated by the allied Spanish and English forces. The crew of a vessel is

often called the ship's company. COMPARISON, kom-par-e-sun (Fr. comparaison), in Phil., is the act of carrying the mind from one object to another, in order to discover some relationship subsisting between them. The result of comparison

is a judgment.

COMPARISON, in Rhet., is a figure of speech frequently employed for the ornament of composition; and, when properly introduced, it adds much to the beauty of style. It consists in viewing two things with beauty of style. regard to a third, which is common to them both. Comparisons are of various kinds; but they may be all arranged into one or other of two clauses, according us they are addressed to the understanding, with a view to instruct, or to the heart, with a view to please. The latter of these purposes is accomplished in various latter of these purposes is accomposited in various ways:—(1) By suggesting some unusual reasonblance or contrast; (2) by setting an object in the strongest light; (3) by associating an object with others that are agreeable; (4) by elevating an object; and (5) by depressing it. The great pleasure in the art of agraparison lies in discovering likenesses between things of the contraction and where was result and at at 15 feet. different species, and where we would not, at first glance, expect a resemblance. Hence the objects compared should not bear too near and obvious a re-semblance to each other. Neither ought comparisons to be founded on likenesses that are too faint orremote.

to be founded on likenesses that are too faint or remote, nor to be carried beyond certain bounds.

Comparison, in Gram, is the means by which is denoted the degree in which the quality expressed by an adjective is possessed by the substantive with which it is coupled. There are three degrees of comparison,—the positive, comparative, and superlative. The positive expresses the quality simply, without any comparison; as good, wise, prudent; and, hence, some do not consider this as a degree of comparison. The comparative expresses that the quality is possessed in a higher degree by that object than another; as, John is taller than James. The superlative expresses the possession of the quality in the highest degree, or in a higher degree than it is possessed by a number of in a higher degree than it is possessed by a number of others; as, Solomon was the wisest man; James is the best scholar in his class. In English, there are two ways of expressing these degrees; either by an inflection or change on the word itself, as wise, wiser, wisest; or by the addition of a word, as prudent, more prudent, most prudent. In many cases, either form may be adopted; but where the former would produce a harsh word, or one difficult to be pronounced, the latter mode is adopted. Adverbs are compared in the same way as adjectives.

COMPASS, kum'-pas (Fr. compas) .- This instrument, generally known as the mariner's compass, consists, in its simplest form, of a small box, in the bottom of which is placed a card with a diagram printed on it, similar to that in the accompanying illustration. Ex-actly in the centre of the card a fine steel pin is inacty in the centre of the card a nue steel pin a inserted, and upon this a light bar of steel, called the needle, is balanced. This needle, when magnetized and suspended on the point of the pin, has the property of turning its ends towards the north and south, varying slightly from a line drawn due north and south by a declination either towards the east or west, which present time, the name of company is expressly given differs in extent at different times, and to such a degree

### Compass

that it is not uniform even for the space of twenty-four hours at any place on the earth spurface. (3ce DECLEARING). In the diagram on the card, the circle represents the horizon, and the person using the compass must imagine himself to be standing within it. The entire circumference is divided into thirty-two squal portions by lines diverging from the centre, called points or rhumbs. The points marked N. S. E. W. are called the cardinal points. (See CARDINAL PRINTED.) The north point is distinguished by a fauras-lie. It will be readily seen, on an inspection of the diagram, how the notation of the points between any two of the cardinal points is managed; thus the point makesy between N. and W. is called N.W., or north-west,—a combination of the letters of the cardinal points between which it lies being used to denote it; that between N.W., and N. is called N.N.W., or north-west,—a case; and that between N. and N.N.W., N.-W.,



MARINER'S COMPASS.

or B. b. W. as it is usually written; meaning north by It may be remarked that whonever a hyphen or connecting mark is used between any two letters in the diagram, the word "by" must be expressed when congram, the word oy must be expressed when reading the points of the compass; and it will be seen that the points which lie on either side of the cardinal that the points which he on either side of the cardinal points, and the points that are midway between these, must be read in this way. The angular distance between any two points is 11° 16°, as the horizon is divided into 360°, and each space between the rhumbs is consequently represented by 360° divided by 32. Different shapes have been adopted for the needle at various shapes have been adopted for the needle at various that it is some to be now submovindered that it. ; but it seems to be now acknowledged that it abould be as light as possible, and in the shape of a very thin prism, placed in such a manner that its narrow sides are turned upwards and downwards, one towards the eye of the spectator and the other towards the card. It was formerly the custom to make a hole in the centre of the flat bar that was used as the needle for the reception of an agate cap, to work on the point of the pin on which the needle is balanced; but it is now considered better that the needle should have no perferation through its centre, but that a hole of little depth should be drilled into the lower side of the prism, that it may be suspended on the pin at a point a little below its centre of gravity, which causes it to possess greater sensibility, with as much freedom of action as before. When the compass is placed on board ship, it is suspended by gimbals (see Gimbals), so that it may always be horizontal, whatever may be the position of It is inclosed in a box called the binnacle the ship. It is inclosed in a box called the binnacic (see BINNACLE). The great requisites in a good compass are, that the motion of its needle should be steady, as well as active and sensible, without oscillation, and that it should be so contrived that it may be easily corrected when deviation is caused by any local attraction. Many attempts have been made to correct distributions as and in the construction of reasels, chiefly from the iron used in the construction of vessels, by surrounding the compass with bars of soft iron or magnets, that will attract the needle in a contrary direction to that in which it is drawn by the metal on heard, and so counteract and neutralize its effects. The methods suggested by Professor Airey, the Astronomer Royal, scribin and Mr. Gray of Liverpool, are considered the best; maps. 512

# Compasses

but the correction of local attraction seems, under any circumstances, to be attended with considerable difficulty and uncertainty. In the royal navy, when compasses have been placed on board a vessel, they are corrected, for the influence of local attraction, by what is termed "swinging" the ship. The ship's head is brought round to every point of the compass successively, and the differences in the bearings, indicated by the compass on board and an azimuth compass on shore, under the charge of an intelligent officer, are carefully noted and registered. The results thus obtained form what is called a correcting card for the vessel in question. The Chinese assert that the mariner's compass was invented by the emperor Houangti, about 2834 n.c., and that it was then used to enable them to direct their course to any distant point on land. The sailors who navigated the Indian Ocean and Eastern seas were well acquainted with its use in the 3rd century after the Christian era, when it was quits unknown in Europe, where it is said to have been introduced by Marco Polo on his return from his travels in the East, about 1260. Flavio Gioja, a Neapolitan sailor, effected considerable improvements in it, and brought it into the form in which we now have it about 1300. Columbus is said to have discovered the variation of the compass in 1492; but this is considered to be doubtful. The inclination or dip of the needle (zee Needle, Dipping, in 1576.

COMPASS, in Mus., a term used to express the extent of notes or sounds comprehended by any voice or instrument.

COMPASS, AZIMUTH.—This instrument is a compass used at sea to find the magnetic azimuth (see AZIMUTH) of the sun or any other heavenly body. It resembles the ordinary mariner's compass in form and general principles; but the circumference of the exterior circle of the diagram on the card is divided into degrees, and a ring is fitted to the top of the box, on which two sights are fixed in a vertical position, exactly opposite to each other, with a longitudinal slit in each, through which an observation of any object can be taken. The needle shows the bearing of the object towards which the sights are directed, with regard to the magnetic pole, and the angular distance thus obtained is its azimuth.

Compass of Voices in Choreses.—Voices are of different kinds; viz. the soprano, or trible, the contralto, the trnor, and the beas. The first of these is in extence, equal with the tenor, but is in pitch an octave higher. The soprano parts are often written in the C clef, on the bottom line of the staff. The extent of the contralto is about the same as the bass, but an octave higher; that of the tenor the same as the soprano, but an octave lower; and that of the bass the same as the contralto, also an octave lower. Voices, if compelled to sing above their medium note, so no become fatigued, and fluish by screaming; again, if required to sing below the medium of the voice, they are deficient in power, and render the harmony feeble and indistinct.

Compasses, kum-pit-ses, mathematical instruments principally used for drawing circles, arcs of circles, ellipses, &c., and for measuring and transferring distances. There are many kinds of these instruments, known as common compasses or dividers, hair compasses, triangular compasses, proportional compasses, beam compasses, and calliper compasses (Née Caterre, Care Caterre, Care Caterre, Caterre,

COMPETERION, home po-tish un (Lat. competitio, from competo, I strive after something in company or together), is the act of seeking or endeavouring to gain genery, is the act of seeking or endeavouring to gain what snother is seeking or endeavouring to gain at the same time. In Pol. Boon, it is that struggle after wealth that is constantly going on in the world, and that leads the purchaser to seek the best article he can at the leads the purchaser to seek the best article he can at the lowest price, and the producer to furnish the best article at the lowest price. Socialists, and others ignorant of the principles of political economy, have declaimed vehemently against competition, and charged npon it all the economical evils that at present exist. There are, doubtless, evils connected with competition; but it is not the less certain that it prevents evils that are much greater. "Instead of looking," says J. S. Mill, "upon competition as the baneful and anti-social mail, "upon competition as the baneful and anti-social principle which it is held to be by the generality of socialists, I conceive that, even in the present state of society and industry, every restriction of it is an evil, and every extension of it, even if for the time injuriously affecting some class of labourers, is always an ultimate good. To be predeted exists computer to the control of juriously arreading some class of natural states are ultimate good. To be protected against competition, is to be protected in idleness, in mental dulness; to be saved the necessity of being as active and as intelligent as other people."—"It is the common error of socialists to overlook the natural indolence of mankind,—their tendency to be passive, to be the slaves of habit, to persist indefinitely in a course once chosen. Let them once attain any state of existence which they consider tolerable, and the danger to be apprehended is that they will thenceforth stagnate,—will not exert themselves to improve, and, by letting their faculties rest, will lose even the energy required to preserve them from deterioration."—(Principles of Political Economy.) Wherever competition is not, monopoly exists, and monopoly in all life forms is the traction. Economy.) Wherever competition is not, monopoly exists, and monopoly, in all its forms, is the taxation of the industrious for the support of indolence; if not of the industrious for the support of indolence; if not frapacity. With the exception of competition among labourers, all other competition is for the benefit of the labourers, by cheapening the articles they consume; and even in the labour-market, it is a source, not of low, but of high wages, wherever the competition for labour exceeds the competition of labour exceeds the competition of labour the never could be a cause of low wages, save by the overstocking of the labour-market. On the establishment of the Branch coverigned concernment of 1848. ment of the French provisional government of 1848 an attempt was made to do away with the natural system of competition among workmen, and to re-munerate a number of workmen alike. A special experiment was tried at the Hôtel Clichy with a govern-ment order for the uniforms of the National Guard, Fifteen hundred tailors were assembled, and were allowed two frances a day as subsistence-money while they worked, and the balance between the sum paid and what the work would have cost had it been executed by an army contractor, was to have been equally di-vided among them afterwards. It was found, how-ever, when the day of reckening came, that not only there no balance to be paid, but that there was an actual loss, and that the two frances a day of subsistence-money, the lowest rate of wages paid to tailors under the competitive system, had overpaid them for the work actually done. Their energies, unexcited by the spirit of competition, relaxed when each man found that the proceeds of his increased exertions were not to be received by himself alone, but to be disretained to be received by binusell alone, but to be dis-tributed over the whole body of his fellow-workmen; and even the thought of "liberty, equality, and fra-ternity," was insufficient to incite them. (See So-CIALISM.)

COMPLEXION, com-plek'-shun (Lat. complecto, I comprise), a term employed to signify the colour of the face and skin, although properly it means the temperament, and natural disposition of the body. Formerly, the human skin was supposed to consist of only two parts,—the cuticle, or epidermis, and the cutis, omy two pares, the cuttlets or challengths, and the cuttle, or real skin; but Malpighi showed that between these two was a soft gelatinous cellular texture, which he distinguished by the title rets mucosum. On this discovery that anatomist offered a suggestion as to the colour very that anatomist outer a suggestion as to the colour of negroes. The rete success is of very different colour in different nations; and the difference of its colour corresponds so exactly with the difference of their complexions, that there can be little doubt that it is the principal seat of the colour of the human com-

plexion. Of the different colours observed amongst mankind, Dr. Hunter gives the following view:—Black,—Africans under the line, and the inhabitants of New Guinea and New Holland. Swarthy,—the Moors in the northern parts of Africa, and the Hottentots in the southern parts. Copper-coloured,—the East-Indians. Red-coloured,—the American Indians. Brown-coloured,—the Tartars, Persians, Arabs, Africans on the Mediteranean coast, and Chinese. Brownish,—the inhabitants of Southern Europe, Sicilians, Spaniarde, and also the Abyssinians in Airica. The Turks, Samoides, and Laplanders, are also brownish. White,—most of the European nations, including the Swedes, Danes, English, Germans, Poles, &c., together with the inhabitants of the islands in the Pacific Ocean.

COMPLUTENSIAN POLYGIOT, kon-plu-tensk-gon, is

COMPLUTERSIAN POLYGLOT, kom-plutensk-gan, is the name given to an edition of the Holy Scriptures published in 1522 at Alcals de Heunres (the ancient Complutum) at the expense of Cardinal Ximenes. The first four volumes comprise the Old Testament, in Hebrew, Latin, and Greek, in three distinct columns, the Chaldee paraphrase being at the bottom of the page, with a Latin interpretation; the fifth volume page, with a Latin interpretation; the latin volume contains the New Testament in Greek, with the Latin Vulgate and interpretations of the Hebrew, Chaldee, and Greek names. The sixth volume is filled with various critical tracts. Only six hundred copies of this edition were thrown off, and the work is scarce and

expensive.

COMPOS OF NON COMPOS, MENTIS. (See INNANITY.)

COMPOSER, kom-po'-zer, literally, a practical musical author, or, in other words, one who invents or composes new music according to the established rules of science, and who studies harmony and melody as connected with effect in composition, independently of the laws of acoustics, or the philosophy of sound. As poser must not be confounded with a theoretical mu A.oom. author, whose business it is to speculate in acoustics, and write on the laws of harmony and melody, but not to interfere with their practical application in composition.

COMPOSITE, kom-poz'-e-fe (Lat. compone, composition, I put together), in Bot., a nat. ord. of dicotyledonous plants, in the sub-class Corolliform. It is one of the largest and most important orders in the vegetable kingdom, and its members are to be met with in all parts of the world. In northern regions the plants are generally herbaceous, but in warm climates they sometimes become shrubby, or even arborescent. The following botanical characters clearly define this great following botanical characters clearly denne the great order:—The leaves are alternate, or opposite, and without stipules; usually simple, but often much divided. The flowers, which are termed flores, are hermaphrodite, or unisexual, are collected in dense heads or eapitula, each collection of florest being on a common receptacle, and surrounded by an international collection of florests. involucre. The separate florets are also frequently furnished with scale-like bractlets, termed pales of the number with scale-like oracticis, termed patter of the everytable. The callyx is superior, closely adhering to the ovary, its limb being entirely abortive, or membranous, or pappose. The corolla is monopetalous, tubular, superior, and usually deciduous; it is ligulate (strap-shaped), bilabiate (two-lipped), or fannel-shaped; in the latter case, four or five-toothed. The shaped; in the latter case, four or five-toothed. The stamens are five in number, rarely four, and are inserted upon the corolla; the filaments are either distinct or monadelphous, and the anthers are united into a tube. The ovary is interior and one-celled, with a single crect ovule. The etyle is simple, undivided below and bifid above; the stigmas are placed upon the inner surfaces of the two divisions. The fruit, termed a cypsela, is dry, indehiscent, one-celled, and crowned with the limb of the calyx, which is often pappose. The seed is solitary, erect, and exabuminous. The order has been subdivided by De Candolle into the following sub-orders:—1. Twalkilara.—Porets tubular. or order has been subdivided by De Candolle into the following sub-orders:—1. Thoughtfora,—florets tubular or ligulate, either perfect, unisexual, or neuter; when perfect they are tubular, with five, or rarely four, equal teeth. 2. Labiatifora,—hermaphrodite florets, or at least the unisexual ones divided into two line. or at reast the uniserial ones divided into which Liquifform.—florets all ligulate and perfect. The first of these sub-orders includes the sections Corymbifers and Cysarocephola, proposed by Jussieu: the last corresponds to the Chicoracea of the same writer. Plants belonging to the sub-order Tublifform abound.

# Composite Candles

principally in hot climates. They are remarkable for their bitter, tonic, and aromatic properties. (See ANTHEMIS, ARTEMISIA, ARMICA.) A few are used for ATTEMES, ARTEMISIA, ARMSOA.) A few are used for dysing. (See Carthauts.) Some are cultivated as esculent vegetables, as the artichols and cardoon. (See these words.) The Labiatiflora are almost confined to the extra-tropical parts of South America. They do not furnish many affectul products. The Liquififora are most abundant in cold and temperate climates. Their chief characteristic is the presence of a milky, hitter matterior or narrotic nine, which possesses bitter, astringent, or narcotic juice, which possesses ulterative, diuretic, aperient, or narcotic properties. The roots of some are esculent, and others, by cultivation with diminished light, become edible as salads. (See Cichorium, Lactuca, Taraxacum.)
Composite Candles, kom'-pos-ite, a name applied

COMPOSITE CANDLES, kom'-pos-ife, a name applied to candles made of different mixtures of ordinary tallow and stearine. They are less hard according to the amount of tallow they contain.

"COMPOSITE NUMBER, in Arith., is one which can be divided by some other number greater than 1, in opposition to a prime number, which cannot be thus divided. Thus 12, 15, and 27 are composite numbers; whilst 11, 47, 59 are not composite. 47, 89, are not composite.

COMPOSITE ORDER. (See ABCHITECTURE.)

COMPOSITION, kom-po-zish'-zum (Lat. compositio), in a general sense, is the act of forming a whole or integral of various dissimilar parts, and is also applied to the body or compound thus formed. In Lit. it is the art of forming and combining deas, and clothing them with language suitable to the nature of the sub-ject. In Log. it is a method of reasoning in which we proceed by gathering together a number of ideas, and combine them into one system, otherwise called syn-thesis. In Gram, it is the joining of two words to-gether, or prefixing a particle to a word, to augment, diminish, or change its signification.

COMPOSITION denotes the art of producing new music according to the established rules of harmony and modulation, and of arranging musical sounds into airs and songs, &c., either for the voice or instruments. airs and songs, &c., either for the roice or instruments. Composition includes melody, or the art of making a single part, and harmony, or that of disposing and concerting several single parts together, so that they may form one agreeable whole. As the musical scale consists only of twelve sounds, a careless observer might imagine that all the possible combinations of those twelve sounds would in time be exhausted, and thus bring composition to an end. It is not so, however, for these targles counds will admit by were combined. for these twelve sounds will admit, by mere combins tion, of 144 different successions, and each of these combinations may be again varied by length, rapidity, force, leguto, and staccato, so as to admit of the construction of many million of tones ; thus, no end can be found to composition, or any excuse made for wearisome monotony.

COMPOSITOR. (See PRINTING.)

COMPOSITOR. (See PRINTING.)
COMPOSIT. (See MANURES.)
COMPOUND INDEREST. (See INTREST.)
COMPOUND RADICLES, kom'-pownd (Lat. compono),
Chem., certain combinations of elements which behave towards acids and bases in the same manner as the elementary bodies. Cyanogen, for instance, which is a compound of carbon and nitrogen, forms compounds with the metals in the same manner as oxygen or chlorine; and ethyl, which is a compound of carbon and hydrogen, acts towards the acids in a similar. manner to iron or lead, forming salts in a precisely parallel way. (See ORGANIC RADICLES.)

Coirpensus way. (see Ones in the light of the compre-density), in Phil, is that act of the mind whereby it apprehends or knows any object presented to it on all the sides on which it is capable of being apprehended

or known.

COMPRENENSION, in English Church Hist., is the name of a scheme proposed on several occusions for relaxing the terms of conformity, and admitting dissenters into community with the Church. It was proposed by Bridgman and Sir Matthew Hale, but without success; and subsequently Tillotson and Stillingfleet attempted it; but the bishops refused their assent. The scheme was revived again after the Revo-Intion, but without success, and at length the Act of Teleration was passed. (See TOLERATION.)
COMPTROLLER, (See CONTROLLER.)

# Conchold

Oon, kon, is a Latin inseparable preposition, which, at the beginning of words, signifies union; as concernse, a running together. In Mus., it signifies with; as, con affetto, with tenderness.

CONCATENATION, kon-kdf-s-naf-shun (Let.), in Phili-denotes the connection that exists between a number of things linked together or dependent on each other.

CONCAVE, kon'-kato (Lat. concavus). — A curve or surface is said to be concave on the side on which straight lines drawn from point to point in it fall straigue mes grawn from point to point in it fail between the curve or surface and the spectator; that side is convex on which the curve or surface falls be-tween the lines and the spectator. Thus the inner surface of a hollow sphere is concave, while the outer (See LRNS.) surface is convex.

CONCAVO-CONCAVE, OF DOUBLE CONCAVE.-Terms applied to lenses which are concare on both sides; when one side is plane and the other concave, the lens

is said to be plano-concave.

Concavo-Convex, or Meniscus, a lens having one side concave and the other convex. When one side is plane and the other convex, the lens is said to be planoconvex; and if both sides are convex, it is a double convex.

CONCEALMENT OF BIRTH. (See INFANTICIDE.) CONCEPTION, kon-sep'-shun (Lat. conceptio), in Phil., is the simple apprehension or perception that we have of any object, without proceeding to affirm or deny anything regarding it.

CONCEPTION, IMMACULATE. (See IMMACULATE

CONCEPTION.)

CONCEPTION OF OUR LADY, NUNS OF THE ORDER OF, a religious order of nuns, founded by Bestrix de Sylva, sister of James, first count of Portalegro, in Portagal. Pope Innocent VIII. confirmed the order in 1439, and granted them permission to follow the rule of the Cistercians. After the death of Beatrix, they were placed under the direction of the Franciscans, as the most zealous defenders of the immaculate conception, and, at the same time, they were required to follow the rule of St. Clara. Their dress consists of a white gown, blue mantle, and scapulary, on which is an image of the Virgin.

CONCERT, kon'-sert (Ital. concertare), a musical entertainment, in which a number of rausicians, both vocal and instrumental, unite in the exercise of their various talents. Concerts sometimes consist of vocal music only. These are distinguished by the name

of vocal concerts.

CONCERTINA, kon-ser-tel-na, a kind of musical wind instrument, patented by Professor Wheatstone in 1829, which is said to bear a greater resemblance to the human voice than any other yet invented. A bad opinion has been formed of this instrument by many people in consequence of their having mistaken for it the so-called German concertina, which is indeed only an improved accordion, shaped like a concertina. real, or, as it is called, the English concertins, is both constructed and fingered in a totally different manner, and although the sounds are produced on the same principle as those of the accordion, there is no more similarity between them in performance than there is between a common whistle and a German flute. instrument has a compass of three octaves and a half, and possesses not only a chromatic, but an enharmonic scale, it having two separate tones. From this fact, as well as from the flexibility of the bellows, the chords are better in tune than in most other instruments of a fixed sound. Its capabilities are such that the most complex harmonies, as well as the most difficult violin complex narmonics, as were as the most dimental violin or flute music, can be played upon it. It also possesses the great advantage of being learnt in a very short time. The best instruction-books for this instrument are, perhaps, those by Giulio Regondi, Professor Wheatstone, and C. Coule.

CONCHIFERA, kon-kif'-e-ra (Lat. concha, a shell: fcro, I bear), the scientific name given to cortain bavalve shells, whose inhabitants are susceptible of no other impressions save those of immediate confact.
The three orders into which this family is divided are

the Brachiopoda, Dimyaria, and Mohamyaria.

Concholo, kon'-koid Gr. konchos, a shell), the name of a curve invented by Nicomedes. It was much used by the ancients in the construction of solid pro-blems. It had for its objects the trisection of an angle,

# Conchoidal

the construction of two geometrical means between two given lines, and the doubling of the cube. Me chanically the curve may be easily described, and is often used in architecture as a boundary-line of the vertical section of columns.

CONCENTIAL ken-key'dil (Lat. concha, shell; Gr. cidos, form), in Min., a term applied to that peculiar fracture of stones and minerals which exhibits convex and conceve surfaces. Flint, cannel coal, and glass, are examples of substances possessing a conchoidal fracture. fracture.

CONCHOLOGY. (See MOLLUSCA.)
CONCHOLOGY. (See MOLLUSCA.)
CONCLAVE, kon'-klaiv (Lat., a private room), is the
name given to the assembly of cardinals, met together
for the purpose of electing a pope, and it is also applied
to the place in which they meet for that purpose. The concleve is usually laid in the Vatican, where on the day after the funeral of the deceased pontiff, they all assemble, and, after the regulations that relate to the conclave have been read, they are locked up in separate apartments, and kept under strict surveillance until the alection has taken place. separate spartments, and kept under strict shrenshine until the election has taken place. They meet once a day in the chapel of the palace, when a scrutiny is made of their votes, and this is repeated every day until at least two-thirds of the votes are in favour of one individual, who is then considered as duly elected to the pontifical chair. Conclusist is a spiritual or secular attendant on a cardinal during a concluse. Each cardinal has one such attendant, who has to take a vow of inviolable silence, and is not allowed to leave till the business is over, except on the ground of dangerous illness.

CONCLUSION, kon-klu'-zhun (Lat. conclusio), in Log. is that proposition which is inferred from certain preceding propositions, called the premises of an argument.

CONCORD, kon'-kord (Lat. concordia, Fr. concorde), in Mus., is the union of one or more musical sounds, which, by harmonizing and agreeing together, produce an agreeable effect upon the ear. When any two single sounds bear so much relation to one another that, on being sounded together, they make a compound sound, that relation is called concord. Concords are of two kinds, perfect and imperfect. Perfect concords consist of the fifth and eighth, and imperfect concords of the third and sixth. These last have another distinction,-that of the reater and lesser third and sixth. Concords are again divided into consonant and dissonant. The consonant concords are the perfect concords and their derivatives; every other is dissonant. This term is also often applied to voices or instruments, with respect to their tuning; as, for instance, we say, "That instrument is not in concord," or not "in tune." "Those voices do not harmonize and agree."

CONCORDANCE, kon-kor'-dons (Lat.), "is a dictionary or index of all the important words in the Bible alphabetically arranged, for the purpose of finding passages, and of comparing the various significations of words."

The importance of a work of this kind was early perceived; and the first work of the kind in any language was the concordance of Hugo de St, Caro, about the middle of the 13th century. By far the most complete and valuable concordance to the English Bible is that and valuable concerdance to the English Bible is that by Alexander Cruden, the first edition of which was published in \$\int\_{\text{tot}}\$ to, 1737, and which has since passed through numerous editions. Perhaps the best concordance to the Hobrow text is that of J. Fürst, entitled "Concordantiae Librorum Sacrorum Veteris Testamenti Hebraicæ et Chaldaicæ" (Leipsic, 1837-40). menti Hebraicæ et Chaldaicæ" (Leipsic, 1837-40). The most recent concordance to the Greek New Testa-The most recent concordance to the Greek New Testa-nient is that of C. H. Bruder, "Omnium Vocum Novi Testamenti Græci," 4to (Leipsic, 1843). The term has also come to be applied to works of a similar nature, of other books; as the "Concordance to Shak-spenre," by Mrs. Cowden Clarke (London, 1847).—For further information on this subject see Watts's Bibliotheca Britannica; Orme's Bibliotheca Biblica; Dar-ling's Cyclopædia Bibliographica; the English Cyclo-

padia, art. Concordance.

CONCORDAT, kon-kor'-did (Lat.), is the name given to a formal agreement entered into between the pope, as head of the Roman Outholic church, and the tem-

# Concubinage

taining certain immunities for the clergy; as exemption from taxation, secular jurisdiction, &c. These have formed subjects of frequent dispute between the popular and the several states of Europe, and have given occasion to concordate settling the rights of each party in any particular state. Most of the concordats have been extorted from the popes, and have been, more or less, concessions of what the Church claims as her rights to the civil power. One of the most important of the earlier concordats was that of Worms, made in 1122, between Pope Calixtus II. and the emperor Henry V. of Germany, which has since been considered as a fundamental law as regards the relations between the fundamental law as regards the relations between the Church and the State in Germany. Sometimes, however, the popes succeeded in concluding concordats to their advantage; but since the middle of the 18th century, the Church has been obliged to resign by concordats many important privileges. One of the most remarkable of the later of these was that extorted by Napoleon, in 1801, from Pope Pius VII. By it the French government obtained the right to appoint the clergy; the clergy became subject, in civil matters, to the temporal power, and all immunities were abolished. But the most remarkable concordat of modern times But the most remarkable concordat of modern times is that which was entered into between the pope and the emperor of Austria in 1855. By it the papal power was widely extended over all the Austrian dominious, and greater privileges conceded to it than had ever before been granted by any German sovereign. By it not only has the Church sole power in ecclesiastical matters, independent of the State, but all institutions for educational purposes are under its control, and it has the power of preventing the dissemination of works of a dancetors. tion of works of a dangerous character.

tion of works of a dangerous character.

CONCRETE, kon'-krete (Lat. concrescere, to grow together), an artificial conglomerate (see CONGLOMERATE), formed by mixing hydraulic lime, water, sand, and shingle, or screened ballast, together. Hydraulic lime is made from argillaceous limestone, which, when burnt, absorbs water very slowly, without swelling, and throws out much heat. (See Lime.) In making concrete, about one part of lime is used to nine parts of shingle, and, as hydraulic mortar hardens very quickly when the lime has alsorbed as when weters. quickly when the lime has absorbed as much water as is necessary for its crystallization, these materials are mixed together before the water is added. When the whole has been thoroughly mingled, it is put, while it is still soft, in the position in which it is required for the artificial foundations of houses, the piers of bridges, &c., and allowed to harden. Concrete is quite impervious to damp, and is therefore well calculated for the foundations and floorings of the basements of buildings built on a damp subsoil, the moisture of which would soon penetrate through brickwork or flagstones.

CONCRETE, in Log., is a term employed in opposition to abstract, and is applied to a notion of an object as it exists in nature, invested with all its qualities and properties. Abstract, on the other hand, is applied to a notion of a particular property or quality, or an object thought of independently and apart from the object itself. ject itself. Thus, a just man is a concrete notion, but iustice is an abstract idea.

CONCRETIONS, kon-kre'-shuns, in Med., are hard sub-CONCLETIONS, kon-kre-anima, in Med., are nard sup-stances that occasionally make their appearance in different parts of the human body. (See Calculus.) Concumnage, kon-ku'-bin-aij (Lat.), is the cohabi-tation of a man with a woman to whom he is not legally

united by marriage. In early times this was a common practice; and men of means had frequently, hesides several wives, a number of concubines, as we read of in the Old Testament. The latter did not enjoy the same rights as a wife, and could be repudiated and dismissed at any time. Both among the Greeks and Romans concubinage was allowed; but it was not legally sanctioned amongst the latter until the time of Augustus. By the Lex Julia and the Lex Papia Popprea concubinage was legally permitted to unmarried men; but not more than one concubine was allowed, Concomance.
Concom

there exists in Germany a peculiar kind of institution under the name of half-marriage, or lest-hand mar-riage, in allusion to the manner of its being contracted. riage, mailusion to the manner of its being contracted, the man giving the woman his left hand instead of his right. It is a real marriage so far as the parties are bound to each other for life; but the woman cannot bear the husband's name or title, neither can her children succeed to his property. The common law of Germany permits this kind of marriage to princes and the nobility.

Concussion, kon-kus'-shun (Lat. concutio, a shaking together), in Med., is applied to a violent commotion or shock communicated to the brain, or the whole or shock communicated to the brain, or the whole nervous system, by collision of the body with some external object. In its slightest form, as tunning sensation is merely communicated, which passes away in a few minutes; in its severest form, death rapidly ensures. In the severer cases the patient becomes immediately pale and insensible; the breathing sometimes matural, but frequently slow and feeble; the pupil rather contracted; the puise usually slow and weak. rather contracted; the pulse usually slow and weak, but sometimes natural; the extremities become cold, the secretions are suspended, and there is frequently names and vomiting. In the treatment of concussion great caution is necessary. The patient at first should be kept warm in bed till consciousness is restored, when when or other stimulants may be cautiously administered. If he seem to be sinking, stimulants should be at once had recourse to; but so long as he remains stationary, no active means should be employed. Here, as in all other serious cases, our object is not to supersede the employment of a medical man, but merely to point out the best course to be followed till such a one can be called.

CONDENSATION, kon-den-sai'-shun (Lat. con, together; densus, close), the rendering of a body more compact, denser, or of more specific gravity, by causing its par-ticles to come into closer contact. The term is usually spplied to the process of converting a vapour into a fluid by distillation or some other method.

Condenser, kon-den'-ser (Lat. condenso, I make thick), a term used to denote any apparatus used for cooling heated vapours and reducing them to a liquid form. In ordinary distillation, the wormtub is the condenser most generally adopted. It consists of a spiral table, which passes through a tub constantly filled with sold water. The vapour enters the tube at the top, and being condensed in its passage, runs out as liquid at the bottom. The condenser of a steam-engine is that the bottom. The condenser of a steam-engine is that part attached to the cylinder where the steam is condensed. The pneumatic condenser is a syringe worked on the same principle as the force-pump, by which a large quantity of air can be forced into a given space.

CONDENSING STEAM-ENGINE. (See STEAM-ENGINE.) CONDENSIA STRAM-LAGINE. (SECTION AND ADDRESS OF THE uncertain whether it shall take effect or not; also it is defined to be what is referred to an uncertain chance which may happen or not happen. There are conditions of divers kinds; viz. conditions in deed and in law, conditions precedent and subsequent, conditions in-kerent and collateral, &c. A condition in deed is that which is joined by express words in a lease or other grant; as, if a man makes a lease of lands to another, grant; as, it a man makes a lease of lands to another, reserving a rent to be paid at a certain day, with a provise or condition that, in default of payment, the keeper of renter.—Condition in law, or implied, is when a person grants another an office; as that of keeper of a park, steward, &c., for term of life. Here, although there be no condition expressed in the grant, yet the law makes one, which is, if the grantee do not putly execute all things belonging to the office, it shall be lawful for the grantor to enter and discharge him of his office.—Condition precedent is when a lease or estate is granted to one for life, upon condition, that if the lease pay to the lessor a certain sum at such a day, then he shall have the fee-simple. In this case,

dale in fee, upon condition that the grantee shall pay to him at such a day such a certain sum, or that his estate shall cease. Here the condition is subsequent and following the estate, and upon the performance thereof continues the estate by the performance of the thereof continues the estate by the performance of the condition.—Inherent conditions are such as descend to the heir, with the land granted, &c.—A collateral condition is that which is annexed to any collateral act. Conditions are likewise affirmatics, which consist of doing; negative, and consist of not doing. Some are forther said to be restrictive, for not doing a thing; and some computery; as that the lessee shall pay rent, &c. Also some are single, to do one thing only; some computing, to do divers things; and others disjunctive. ALE. ALEO SOME are single, to do one thing only; some copulative, to do divers things; and others disjunctive, where one thing of several is required to be done.

CONDITIONAL FRE. (See FRE.)

CONDITIONAL PRE. (See FRE.)

CONDITIONAL PRE. (See FRE.)

a phrase introduced by Sir William Hamilton to denote the limited region of knowledge open or accessible to the human mind. "The conditioned," he ways, "is that which is alone conceivable or cogitable; the unconditioned, that which is inconceivable or incogitable. The conditioned, or thinkable, lies between two extremes, or poles; and these extremes, or poles, are each of them unconditioned, each of them inconceivable, each of them exclusive or contradictory of the Of these two repugnant opposites, the one is that of unconditional or absolute limitation; the other, that of unconditional or infinite illimitation." infinite and the absolute, properly so called, he holds to be equally inconceivable to us. "We must believe in the infinity of God; but the infinite God cannot by us, in the present limitation of our faculties, be comprehended or conceived. A Deity understood would be no Deity at all; and it is blasphemy to say that God only is as we are able to think him to be. We know God according to the finitude of our faculties; but we believe much that we are incompetent to know."—Ref. Hamilton's Lectures and Discussions; Mansel's Bampton Lectures.

CONDOR, kon'-dor (Sarcoramphus gryphus), a large bird of the Vulture species. It is almost strictly confined to the immense chain of the Andes, as is called the vast mountain-range that runs along the whole west coast of South America. Humboldt, who, with his companion Bonpland, passed a considerable period in these regions, and lost no opportunity of observing the condor and making the strictest inquiries concerning its habits, was cuabled to clear away much of the mystery that had hitherto attached to the bird. Premystery that had hitherto attached to the bird. Previously it was regarded as a bird of such monstrous proportions, that in its flight it cast a shadow on the earth like a big cloud, and as so feroclous as to snatch up and bear off infants, kids, and lambs in an instant. Humboldt, however, found the listle children of the Indians sleeping in the open air, while their parents were away gathering snow to sell in the neighbouring towns; and at least half a dozen condors were in sight, hovering sloit and perched on the neighbouring heights. To all his inquiries on the subject, he was answered that a single case of child-stealing by bouring heights. To all his inquiries on the subject, he was answered that a single case of child-stealing by these big birds was unknown. Yet that this arises from no lack of courage on the part of the condor is certain, for, as Humboldt was informed, two of them will even attack a heifer, pursuing it for miles, and wounding it with their beaks and talons. Gradually the poor animal will relax its speed, and from sheer exhaustion and thirst loll its tongue. Now is the condor's time. In an instant it darts at the tongue, and maintains so cruel a grip, that by and-by the heifer sinks to the ground at the mercy of its ene-mies. The above-named renowned traveller also mentions an astonishing instance of vitality displayed

by a condor which some Indians at Riobomba had taken alive. They first strangled it with a lasso and be lawful for the grantor to enter and discharge him off his office.—Condition precedent is when a lease or several minutes; yet scarcely was the lasso removed the lessee pay to the lessor a certain sum at such a day, then he shall have the fee-simple. In this case, then condition precedes the estate in fee, and on performance thereof gains the fee-simple. The same rule, the condition precedes the estate in fee, and on performance thereof gains the fee-simple. The same rule, the condition precedes the estate in fee, and on performance thereof gains the fee-simple. The same rule and the entered its body, and wounded it in the neck, the condition of the condition subsequent is when a man grants to another his manor of the ground, it did not die of its wounds for half an another lis when a man grants to another his manor of the condition on the same rule is the property of the ground, it did not die of its wounds for half an another lis when a man grants to another his manor of the condition of the condition of the ground, it did not die of its wounds for half an another list when a man grants to another list manor of the condition of the conditio

### Condottieri

its eggs, which are three or four inches in length, and use eggs, which are three or four indices in length, and parfectly white, on the bare rocks. Broderip relates that he saw an egg laid by one of the pair confined in the Zoological Cardens. It was on the bare naked door of the prison. There was no appearance of a nest of any kind. The hen condor does not appear to have exhibited any inclination to sit on her egg, so the next one that was laid was put under a Dorking fowl. The result was successful; but the issue, a male condor, only lived three weeks.

The result was auccessin; but one issue, a marcolardor, only lived three weeks.

Condottient, kon dot-te-air'-e, an Italian word, signifying captains, chiefs, or leaders, but generally endoyed to designate soldiers of fortune, who raised troops of cavalry and infantry at their own expense, and engaged their services as mercenaries with govern-ments or princes. They were numerous in the 14th and 15th centuries in the Italian wars. Sir John Hawkwood, an Englishman, was one of the earliest and most famous in Italy about the reign of Edward III. The troops under the command of the conduttieri were well armed and equipped. In many cases the leaders had considerable military skill, but as their bands only fought for hire, the chief endeavour was not to slaughter but to take prisoners and obtain ransoms. The invasion of Italy by the French, under Charles VIII., put an end to these bloodless fights, by bringing more serious warfare on the field. Although many conductioni obtained great honour and wealth, only one attained high rank,—Francesco Sforza, ori-ginally a peasant. In 1451 he constituted himself duke of Milan, and transmitted the sovereignty to his descendants.

CONDUCTOR (from Sp. conducir, to lead), in Mus. one who superintends everything connected with a concert, and who also directs the performance of s hand or orchestra. His duties are extremely operous. hand or orchestra. His dutics are extremely operous, as they do not consist only (as some people imagine) in the use of his bâton, or in his performance, either as a soloist or necompanist. Indeed, any person who wishes to become a good conductor must possess such a variety of qualities that are rarely found in one man. Some of these qualities we have enumerated below:—1. It is absolutely necessary that he who wishes to succeed as a conductor must be a composer in the full acceptation of the term. 2. He must possess a knowledge of the world as well as of music, and unite great firmness with a strong determination of purpose. 3. He must have a theoretical us well as a practical knowledge of every piece performed.

4. He must have a quick ear, rendered in the highest degree acute by culture, in order to enable him to detect the slightest error at rehearsal. 5. He must be endowed with a most delicate perception of the measure of time and the play of rhythms, so that he may indicate the tampos with accurate division and decision; he must not beat time like a machine, nor yet in so extravagant or violent a manner as to divert the attention of the audience from the music to the eccentric gyrations of his spasmodic below. 6. He must slee be able to accompany, at the shortest notice, on the pianoforte, all kinds of pieces in all kinds of keys, in order to suit the different singers. All this, and much more, is required of a person who aspires to the important office of musical conductor.

CONDUCTORS AND NON-CONDUCTORS OF ELECTRI-CITY, kon-dukt'-ors, terms applied to substances according to whether they receive and communicate electricity readily or not. When a rod of metal is made to touch the prime conductor of an electric machine after it has been charged, all the electricity passes through the rod and through the body of the passes through the rod and through the body of the experimenter into the ground. The metal in this case is said to be a conductor. If, however, a rod composed of glass or shell-lie is used, the electricity will not be carried off. In this case the glass or shell-lie is said to be a non-conductor. All substances conduct electricity in the same manner from metals to lac and gases, but in different degrees; and the term non-conductor only signifies that the substance has a very low power of conducting. In frictional electricity, the best conductors are the metals; after which come graphite, \*\*See-water, spring-water, and rain-water. Ice is a worse conductor than fluid water. Alcohol, ether, paper, dry wood, and atraw are also inferior conductors. Among the substances reckoned as non-conductors. Cone

ductors are shell-lac, amber, resin, sulphur, glass, silk. wool, hair, feathers, &c. In galvenic electricity tricity in a feeble manner are almost, if not altogether, non-conductors; and the metals which are nearly alike in conveying frictional electricity differ widely in their powers of cenveying that obtained from the galvanic battery. When heated, the conducting power of metals is weakened; but in nearly all other substances the effect of heat is to increase the power of conduction. Shell-lac, wax, amber, and sulphur become conductors when fused; and glass conducts readily at a red heat. A conductor is said to be insulated when it rests upon non-conducting supports. In electrical apparatus glass is the non-conductor most employed. It requires to be kept very dry, as any moisture on its surface weakens its insulating power. The discovery of the identity of lightning and electricity has not been without its practical results; amongst which may be reckoned the application of lightning conductors to reckoned the application of tighting conductors to buildings and ships. For buildings, Franklin's original proposition is that generally adopted. It consists in erecting a continuous metallic rod by the side of any building. The rod is pointed at each end, and extended above the highest part of the place to be protected at one extremity, the other penetrating deep into the one extremity, the other penetrating deep into the earth, or in contact with water. The highest point of the rod is generally made of copper, which does not rust. Iron points are very liable to acquire a coating of rust, which is a non-conductor, and diminishes their efficacy. The best conductors for ships are the fixed conductors recommended by Sir W. Snow

CONDUIT, kon'-dit (Fr. conduit; Lat. conducere, to lead along), the name more especially given to any small artificial channel or watercourse, by which water is led along from one place to another. When the conduit is large enough to allow the passage of barges conduit is large enough to allow the passage of barges throughout its length, it is called a canal. (Rec Caral.) The name was also formerly given to plain or ornamental buildings, similar to the drinking fountains of the present day, and provided with any or open pipes, whence water could always be procured. Conduits may be open or closed, when open, they are often called "leats," and the mode of structure adopted is the form used for cutting canals. When closed, they are canarily make of brickwork and circular in above are generally made of brickwork, and circular in shape, or flat at the bottom, with an arched covering above In constructing a close conduit for the conveyance of water for drinking, care should be taken to make the brickwork impermeable to water, that no impurities

may make their way through, and affect the water.

CONDYLURA, kon-di-lu-ra (Condylura cristata), a small insectivorous animal of mole-like appearance, found in North America. It is about four inches and a half long from nose to rump, and has a bushy tail more than three inches long. Its head is remarkably large, body thick and short, and nose rather thick, and the control of the and projecting beyond the mouth. At the end of the nose is a flat star-like process composed of seventeen cartilaginous points. These animals do not make such hills as the European moles, but only little subterraneous walks in the fields, forming banks about four inches broad by two inches thick, and which give way when trod on.

CONE, koun (Fr. cone, Gr. konos), in Bot., a collec-

tive more or less clongated fruit, composed of a number of indurated scales, each of which bears one or more naked seeds. The fruit is seen in the fir, larch, spruce, araucaria, and many other plants of the nat. ord. Conifera. A peculiar modification of the cone is seen in the cypress and in the juniper, and is termed the



CONE AND GALBULUS.

Gulbulus. It differs from the true cone in being more or less rounded in form, and in having the heads of the scales greatly

5/7

Cone

enlarged. In the galbulue of the juniper the scales are fleshy, and are united together into one mass, so that it resembles at first sight a berry. The figures represent the fruits of the Scotch fir (Pinus sylvestris) and the oppress (Cupressus semperatures).

Cors., in Geom., denotes a solid body, which terminates in a point and has a circle for its base. The axis of a cone is a straight line drawn from the apex to the centre of the circle forming the base. When the axis is prepared in the player of the hase the cone is is perpendicular to the plane of the base, the cone is said to be right; and when the axis is inclined to the plane of the base, the cone is said to be oblique. A transacted cone is the lower part of a cone cut by a plane parallel to the base. The area or surface of a plane parallel to the base. The area or surface of a right cone, exclusive of the base, is equal to a triangle, the base of which is the periphery, and its height the alant side of the cone, or equal to the sector of a circle whose radius is the slant side, and its are equal to the circumference of the base of the cone. Every cone, whether right or oblique, is equal to one-third part of a cylinder of equal base and altitude: the solid contents are therefore found by multiplying the base by the altitude, and taking one-third of the product. The centre of gravity of a cone is in the axis, at a distance from the centre of the base equal to one fourth the distance from the vertex. (See Conic Sections.)

COMEDERACY, kon-fed'-er-d-se (Lat. con, together;

fadus, a league), a term in politics signifying an alliance of independent states for a common object. It is sometimes employed, but less properly, to the alliance of individuals. (See Constituent)

CONFEDERATION OF THE RHINE, kon-fed-er-ai'-shun. -During the war between France and Austria, in 1805, several German princes, feeling that they were too weak to remain neutral, were compelled to ally themselves with France. The next year the arch-chancellor announced at the diet that Cardinal Fesch, the uncle of Napoleon, had been appointed as his coadjutor. This proceeding was entirely at variance with the German constitution; but the same year sixteen German princes formally signed an act of confederation, in which they declared that their connection with the Germanic empire was dissolved, and that henceforth they were allied with France. They at the same time tried to justify the course they had taken by pointing out the evils and weaknesses of the Germanic government. Bacher, the French ambassador, at the same time declared that Napoleon no longer recognized the German empire. Several other princes recognized the German empire. Several other princes joined the Confederation of the Rhine, as it was called, during the next two years; and at the close of 1808, a territory, with an area of 122,236 square miles, was under the protectorate of the French emperor. The terrible reverses sustained by the army of France lifted a heavy burden from the German nation, and in the year 1913 they rose and threw off the degrading yoke which they had been compelled to bear. This league terminated with the fall of Napoleon in 1814,

league terminated with the fall of Napoleon in 1813, and was succeeded by the Germanic Confederation.

CONFEDERATION, THE GREMANIC, kon-fed-er-ai-shun, the federal union of the sovereign princes and the free towns of Germany. It was formed at the congress of Vienna in 1815, and was framed to supply the want of the ancient imperial government dissolved. in 1808. As originally settled, Germany was divided into forty sovereign states, or portions of states, but the number is now reduced to thirty-five. The diet is the number is now reduced to thirty-five. The diet is fifteenth or sixteenth year. The person confirmed formed by plenipotentiaries, and is permanent; it reforms the representative body of the league, and six at Frankfort-on-the-Maine. When the confederation meets as a general assembly, six of the states—Austria, Frussia, Bayaria, Saxony, Hanover, and Wurtenburg—have four votes each; five other states, three seach; four, two; and the rest one. In the formation of fundamental laws, admission of new members into the confederacy, and on religious questions, unanimity is required. The votes in the ordinary assembly are so importioned as only to make seventeen in all, as it would be manifestly unfair if the votes of the smaller states were of equal force with those of the greater. The ordinary diet manages the general affisirs of the confederation. Austria presides in both diets; but each states are offer its propositions, and the president in ordinary diet manages the general affisirs of the confederation. Austria presides in both diets; but each state or its plant or sixteenth year. The person confirmed in fifteenth or sixteenth year. The person chairs and work in their place.

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### Confiscation

federal act, a large army, the peace establishment of which consists of 120,000 men. In case of war, the states are bound to furnish troops to the field in the proportion of one in the hundred of the population.

CONFERVOIDE, kon-fer'-toy-de, in Bot., a sub-ord. of

the Alga (which see).

Confession, kon-fee'-shun (Lat. confileor, I acknowledge), in Theol., is the verbal acknowledgment which a penitent makes of his sins to God or to a fellowcreature. Among the Jews, it was the custom on the annual feast of expistion for the high priest to make confession of sine to God, in the name of the whole people. Besides this general confession, the Jews were enjoined, if their sins were a breach of the first table of the law, to make confession of them to God; but violations of the second table were to be acknowledged to their brethren. Confession seems to have been to their Deterrent. Concession seems to have been early introduced into the Christian church; but at first it took place openly, and was chiefly in the case of such as had apostatized themselves or been guilty of any flagrant offence, and were desirous of being readmitted into the Church. The practice of private or aumicular confession seems to have gradually crept in about the 5th century; and Innocent III., in the fourth Lateran council (1215), made it obligatory on every adult person to confess his sins to a priest at least once a year. The person confessing is allowed to conceal no sin,—at least no mortal sin,—that he remembers to have committed and not to have already confessed, and the father confessor is bound to perpetual secrecy. Confession obtains also in the Lutheran church, but with this difference, that while in the former case it is obligatory, it is here only recommended as a means by which a contrite sinner may obtain advice and consolation.

Confussion, in Law, is where a prisoner indicted of an offence, and brought to the bar to be arraigned, upon the indictment being read to him, and the court demanding what he can say thereto, he confesses the offence and the indictment to be true. fession, in civil cases, is where the defendant confesses the plaintiff's right, or, in prosecutions under penal statutes, by which confession there may be a mitigation of a fine against the penalty of a statute, though

not after a verdiet.

CONFESSION OF FAITH, is a formulary detailing the articles of faith held by any particular church, most ancient of these are what are known as the Apos tles', Niceue, and Athanasian creeds. The Church of Rome, while receiving these, had no fixed and authoritative confession till the council of Trent. A summary of the doctrines contained in the canons of that council is given in the creed published by Pius IV. (1564) in the form of a bull. The numerous other confessions will be found coticed under their respective heads, or under the names of the different sects to which they belong, in other parts of this work.

CONFIRMATION, kon-fir-mai'-shun (Lat. confirmatio, strengthening), in an ecclesiastical sense, denotes the ceremony of laying on of hands in the admission of baptized persons to the enjoyment of church privileges. In the early Church, this ceremony appears to have been performed immediately after baptism; but afterwards a delay of about seven years came to be interposed after infant baptism. The present practice in the Church of England is to delay it until about the fifteenth or sixteenth year. The person confirmed fifteenth or sixteenth year. The person confirmed releases his godfather and godmother of their obliga-

# Conge d'Elire

offence,—are bone configurate, so we say of those which are forfeited to our crown, or the queen's exchequer, for any offence which causes or works a forfeiture.

Cones n'Eller, koan (a) jhay de(r) leer (Fr., leave to choose), is the king's license or permission sent to a dean and chapter to choose or elect a new bishop

when a bishopric becomes vacant.

Congriation, kon-jel-ai-shun (Lat. congelo, Ifreeze), the process of passing from a fluid to a solid state, whether through the effect of pressure or the lowering of the temperature. Until lately, the latter cause was held to be the chief reason of congelation. It is now very apparent that temperature is only one element.

very apparent that temperature is only one element. Water may be cooled many degrees below 32° Fahr., and yet retain its liquid state. (See ICE.)

CONGER EEL, kong'-qur (lat. anguilla conger).—This fish may easily be distinguished from the fresh-water species by the upper jaw being the longest, and the dorsal fin commencing much nearer the head. On account of this difference, Cuvier separated them from the rest as a sub-gen. It is durker on the upper parts than the common cel, and brighter beneath. It attains a very large size, weighing occasionally from seventy to a hundred pounds, and measuring six and eight feet in length. The principal conger-fishery is on the Cornish coast. The fishing takes place at night (the darker nish coast. The fishing takes place at night (the darker the more chance of success), and the ordinary bait is a pilohard. "It is dreadfully voracious," says Mr. Couch; "it spares not even its own species. From the stomach savs Mr. Couch : of a specimen weighing twenty-five pounds I took three common dabs, and a young conger of three feet in length. The power of jaw in this fish is very great; in the stomach of small specimens examined on the coast I have found the young testaceous coverings of our shell-lish comminuted into fragments. They are often tempted by the crustacea entrapped in the lobsterpots to enter these decoys in order to feed on them,

and are thus frequently captured."

CONGESTION, kon-jest'-shun (Lat. congestio, from congero, I amass), is a term employed in Med. to denote an unnatural accumulation of blood in the capillary vessels of any part, accompanied with dis-ordered function of the organ in which such accumulation takes place. The organs most liable to congestion are the brain, lungs, and liver; but other parts are also subject to it. It is usual to distinguish two kinds of congestion,—a passive and an active. In passive or simple congestion there is merely an accumulation of blood arising from distension and diminished vitai energy in the capillaries; in active congestion, on the other hand, the blood-vessels are in a state of inordinate activity, and a preternatural quantity of blood is determined to them. Anything may be the cause of concertion which diminishes the vital energy of the capillaries, or which increases the quantity of blood which they contain. (See INFLAMMATION.)

CONGLOMERATE, kon-glom'-e-rait (Lat. con, together glomerare, to gather in round heaps), in Geol., a rock composed of rounded and water-worn fragments of stone, bound or cemented together by silicious, ferruginous, or calcarcous matter. The component frag-ments may vary from pebbles the size of a pea to boulders half a ton in weight. Some conglomerates are commonly known as pudding-stones, from the resem-blance of the pebbles in the mass to the fruit in a plum-midding.

plum-pudding.

kon-gre-gai'-shun (Lat. con, CONGREGATION, grex, a flock), commonly signifies an assembly of persons met together for the purpose of religious worship. In the Roman Catholic church it is applied to certain boards of cardinals, prelates, and others intrusted with the management of particular branches of the affairs of the Church. There are twenty-one of these congregations, fifteen for spiritual and six for temporal purposes; the chief of them being the Congregation de Propaganda Fide, for consulting as to the advance-ment of the Catholic religion throughout the world; the ment of the Cashole religion throughout the world; the Congregation of the Index, for examining books, and deciding upon their fitness for general perusal; the Congregation of Sacred Rites, for regulating all matters relating to ceremonies and rites in worship; the

# Conifere

Discipline; and the Consistorial Congregation. These congregations act as a check to the power of the pope; for, though their proceedings are usually sanctioned by him. he cannot put a veto upon them without weighty reasons. A company of monks or religious persons, forming a subdivision of an order, is also called in the Church of Rome a congregation. If The called in the Church of Rome a congregation. "The Congregation of the Lord" was a title assumed by the first Scotch Presbyterian reformers, in contradistinc-tion to the Church of England, which they called the "Congregation of Satan." They appeared first in 1557 under the duke of Argyle, and at a later period were led by John Knox.

CONGERGATIONALISTS. (See INDEPENDENTS.)
CONGERSS, kon'-gress (Lat. congresses), a meeting of
the rulers or representatives of different states, for the purpose of considering matters of international interest. Although the term is not used in this sense at the present time in America, it originally had this significa-tion. The first congress held in America was a meettion. The first congress held in America was a meeting of the delegates of the various British colonies, to consider their grievances, in 1765. Before a treaty of peace is signed, there is usually a meeting of plenipotentiaries, which is called a congress. The term is, however, more strictly applied to those great diplomatic conferences where extensive schemes of future policy are determined upon. The congress of Vienna, held in are determined upon. The congress of Vienna, held in 1815, at the conclusion of the great war, is one of the most famous, and also the congress of Carlabad, held in 1819, for regulating the affairs of Germany; the congress of Paris, held in the year 1856, at the conclusion of the Crimean war, had for its purpose the consideration of the relations between Russia and It is the most important congress of the day. The national legislature of the North Turkey. present day. American states is called the Congress in the constitu-tion of the general government. It consists of a Senate and a House of Representatives, each constituting a distinct and separate branch. The term congress a distinct and separate branch. The term congress has also been applied in late years to any philanthropical meeting on a large scale, in which the representatives of different nations have appeared; such as the Peace Congress, the Social Science Congress.

Congruity, koing-rai-cele (Chat. congruo, I come together, correspond, or agree), denotes a suitableness or relation of agreement between different things. Congruity, wherever it is perceived, is agreeable, agreeable, and is so nearly allied to beauty as to be commonly regarded. as a species of it. It is difficult to define what the nature of this relationship is, or to ascertain what are the particular objects which, taken in conjunction, manifest congruity; for there are many objects that suggest neither congruity nor incongruity. Incongruity, on the other hand, is an unsuitableness between

gruity, on the other hand, is an unsuitableness between different things, and is disagreeable.

Conic Sections, kon'-ik sek'-shuns, the curves formed by the intersection of a right or oblique cone and a plane. If the cone is cut by a plane parallel to the base, the section is a circle; if the section is made obliquely, that is, nearer to the base at one end than the curve of the control of the large of the control of the large of the control of the large o the other, a curve is obtained which is called an ellipse; if the section is made parallel with the axis, perpendicular from the vertex, or so as to make a greater angle with the base than is made by the side of the cone, the curve obtained is called a hyperbola; and if the section is made parallel with one side of the cone, the curve is called a parabola. The ancient Greeks investigated the properties of conic sections with great acuteness; and a work on them is still extant, written by Apollonius of Perge.

CONIFER, ko-nif'-e-re (Gr. konos, a cone; Lat. fero, I bear), in Bot., the Pine fam., a nat ord. of dicotyledonous plants, in the division Gymnosperma,—resinous trees, or overgreen shrubs, with branched continuous stems. The leaves are needlebranched continuous stems. The leaves are needle-shaped or lancolate, parallel-veined, fascicled, or imbricate. The flowers are naked (without floral envelopes), and monecious or discous, the male flowers being arranged in deciduous amenta, and the female flowers in cones. The fruit is either a cone or ters relating to ceremonies and rites in worship; the a galbulus. The seeds are naked, hard externally, and Congregation of Relics, for inquiring into the genuine- ness of sacred relics; the Congregation of the Holy Office, or Inquisition, for taking cognizance of heresies occur in cold and tropical regions. There are about and all novel opinions; the Congregation of Religious 30 genera, which inquide about 120 known species.

#### Contain

They possess very important properties; many supply valuable timber, and mast of the species contain an elec-resinous juice, or turpentine, which is composed of a relatile oil and resin. (See Arks, Pinus, Just-PREUS, CEDRUS.)

CONIUM, ko'-ne-um, in Bot., the Hemlock, a gen. plants belonging to the nat. ord. Umbellifera. I most important species is C. maculatum, an indigenous plant, which is extensively employed in medicine to retirev pain, relax spasm, and compose general nervous irritation. It owes its properties chiefly to the presence of a colourless oily liquid, with a penetrating mouse-like odour, to which the name of Conic has been given. In improper doses hemlock is a powerful poison, and many latal accidents have arisen from the having been mistaken for humiless umbelliferous claste; it may, however, he readily distinguished by the botamical characters. The stem is large, round, its botanical characters. The stem is large, round, and smooth, with spots upon it of a purplish-black colour; the leaves are dark green, and shining; the general involucre consists of from three to seven leaflets, the partial involucre of three leaflets; the fruit has undulated, crenated primary ridges, and contains no sitts; and the whole herb, when bruised, evolves a disagreeable smell, which has been likened by some to that of mice, and by others to that of cat's urine. No chemical antidote is known for hemlock.

CONJUGAL RIGHTS, kon'-ju-gal (Lat. con, and jugo, I yoke) .- A suit for restitution of conjugal rights is a species of matrimonial causes, and is brought in the Court of Divorce whenever either the husband or wife is guilty of the injury of subtraction, or lives separate

from the other without any sufficient reason.

CONJUGATION, kon-ju-gai'-shun, in Gram., is a regular distribution of the several inflections of verbs into their different voices, moods, tenses, numbers, and persons. (See Veeb and Grammar.)

CONJUNCTION, kon-junk'-shun (Lat. conjungere, to join together), in Astron., when two heavenly bodies have the same longitude or right ascension (see ASONNSON, KIGHT), they are said to be in conjunction. If they also had the same declination, or latitude, north body would apparently cover the disk of that which is more remote. When any heavenly body is in a line between the earth and the sun, it is said to be in conjunction with the latter; but it is said to be in opposition to it when the earth comes between the body in question and the sun. Geocentric conjunction is the conjunction of two heavenly bodies as viewed from the earth; but when heliocentric conjunction is spoken of, the conjunction is understood to be considered as if viewed from the sun. True conjunction is the observation at the earth's surface reduced to what it would be if witnessed from the centre of the earth.

CONJUNCTION, in Gram., is an indeclinable word or particle which serves to unite words, sentences, or clauses of a sentence, and to show their relationship or dependence upon one another. There are two kinds -the conjunctive and the disjunctive; of ocujunctions,—the conjunctive and as, Peter and John, James or Robert.

CONJUBATION, kon-ju-rai'-shun (Lat. con, and juro, I swear), is the act of using certain words or ceremonies to obtain the aid of a superior being, more particularly applied to the magical words, characters, or ceremonies, by means of which evil spirits, tempests, &s., are said to be raised or driven away. The Romish priests formerly affirmed that they could exper devel by hely water prepared in a particular manner, and aprinkled over the postessed person, with a number of conjurations and exorcisms. According to some authors, the difference between conjuration and witcheraft is, that in the former case the effect is accom-plished by prayers and invocation of God's name; whereas in the latter it is brought about by supplicating the aid of the devil.

CALIBY THE BIG OF THE GEVIL.

CONNOISEEUR, kom-noy-sure' (Fr. connoiseeur, from Lat. cognoscere, to know), a person who is skilled in any subject, and particularly one who is well fitted to judge of the merits of paintings and soulpture, from possessing a critical knowledge of works of art.

### Conscience

given to the invasion of England by William of Normandy, who, having overcome Harold II. at the battle of Hastings (15th Oct. 1086), obtained the crown of England, and became the founder of the Norman dynasty.

CONSANGUINITY, or KINDRED, kon-san-guin's-te (Lat. consanguinitas), is the connection or relation of persons descended from the same stock or common (See COLLATERAL CONSANGUINITY, and ancestor. LINEAL.

CONSCIENCE, kon'-shens (Gr. suneidesis, Lat. con scientia, Fr. conscience, Ger. gewissen), is a term applied to the moral nature of man in general. According to its ancient usage among the Latins, the word conscientia was primarily applied to being privy to, together with another; and in its secondary meaning it bore a moral signification, or knowledge of one's own conduct, whether right or wrong. The modern use of the word is more extensive in its sense, denoting not only what the Latin moralists signified by it, not only the sense of the difference between right and wrong in our own and others' conduct, but containing likewise the important element of the feeling of human responsibility. Thus conscience, as it is at present accepted, is not only applied to the moral judgment which accompanies all moral actions, as to whether they are right or wrong, but it denotes, besides, that feeling of approbation or disapprobation, of rectitude or contrition, which invariably accompanies all moral actions. Thus a judgment and an emotion lie at the root of what is known as the conscience; for not only are men accustomed to say, "My conscience cannot approve of such and such conduct," but they likewise own to being disturbed by certain "qualms of conscience" on occasion of any violation of rectitude either in their own or in others' experience. Thus conscience and the moral faculty mean almost the same thing; although the former, as it is unques-tionably the more ancient term, so it seems to be the one which is ordinarily employed in common conversation instead of its heavier and more learned rivals of the moral sense, the moral nature, and so forth. Nearly all writers are agreed as to the existence of some sort of a conscience in human nature, whether or not they are prepared to subscribe to the moral faculties, and moral senses, and moral natures of other writers. Thus Adam Smith, who is a strong advocate for sympathy, as the ultimate explanation of our moral nature, is loud in his proclamation of the existence of conscience Sympathy, indeed, is with him the ultimate resolution which he gives to the popular conscience. And Dugald Stewart deplores the employment of such metaphorical language as "this man in the breast," of Adam Smith, instead of what he considers as the more appropriate terms of conscience and reason. (See Stewart's Collected Writings, Active and Moral Powers, vol. i. p. 333.) Smith, in his Theory of Moral Sentiments (part vis. 2., c. 3), says that the conscience "properly signifies our consciousness of having acted agreeably or contrary to the directions of some moral familts." And Dureald the directions of some moral faculty. And Duvald Stewart (l. c.) adds, "The truth I take to be this, that the word conscience coincides exactly with the moral faculty; with this difference only, that the former refers to our own conduct alone, whereas the latter is meant to express also the power by which we approve or disapprove of the conduct of others." But this seems a somewhat arbitrary limitation of the term conscience; and in this article it is made throughout to apply both to our own moral conduct and to that of others. ethical philosopher, of course, is bound to inquire into the nature of the distinction between right and wrong in human conduct, and into the complexion and character of those feelings with which right and wrong are contemplated by man; but conscience, in so far as it is a portion either of ethics or of the practical conduct of man, merely requires to ascertain that there is such a principle as right and wrong in human nature, and that there are such feelings as those of responsibility to judge of the merits of paintings and sculpture, and of remores, which approve or disapprove of human from possessing a critical knowledge of works of art. It may be considered as equivalent to the vulgar term "knowing one" used on the turf. In the Italian, entering the most substitution of morality which may be held, the inquirer anch a person is termed cognoscente.

Conquest, The, kong-kwest in Hist., is the name little trouble. Suffice it to say, that this principle in

### Consciousness

human nature has been analyzed into a judgment and an emotion; one gives himself little anxiety as to the ultimate origin of this judgment, or as to the fine elements of which this affection may be composed. The unrepented pleasure, accordingly, of Socrates; the variously modified views of human happiness of Plato and Aristotle; the mere reverence for morality or bare acts of duty of the Stoics; the pleasure theory of Epicurus and his school; the human will and the of Epicurus and his school; the human will and the divine will of the schoolmen; the greatest happiness principle of Bishop Cumberland, of Jeremy Bentham, and of the two Mills; the rational views of Cudworth and of Price; the eternal fitness of Clarke; the moral sense of Shaftesbury and Hutcheson; the refined view of the selfish system of Leibnitz; that love to being in general of Edwards; the principle of reflection or conscience of Batler; and a class of desires and affections having disregations and volitions for their affections, having dispositions and volitions for their object, of Mackintosh: these, we say, are all views more or less precise, more or less closely allied to the truth of the real theory of our moral nature, be it what it may. We may remark in general, that of all speculators, Bishop Butler was undoubtedly the first to point out the supreme authority of conscience in the moral constitution of man. Although the ancient moralists had beautifully described the result of such a state of matters as Butler pointed out as the abiding law of our nature, and while Lord Shaftesbury and Francis Hutcheson laid much too little stress on this unquestionably the first to point out an important dis-tinction, which has, since his time, been adopted by all moralists. It accordingly appears that this moral faculty or conscience is the supremely regulative principle in our constitution. Give the laws which govern its activity free scope, the most beautiful harmony and propriety of conduct will ensue; violate those laws, and the direct confusion in character and in conduct is the result. (See Stewart's Active Powers and Mackintosh's Ethical Philosophy, and the other writers

Mackintosh's Ethical Philosophy, and the other writers alluded to in this article.)

Consciousness, kon'-shus-ness (Gr. suneidesis, Lat. conscientia, Fr. conscience, Ger. becausetseyn), is the recognition by the mind of its own acts. While it is thus a comprehensive term for the complement of all our mental energies, it nevertheless, from its high generality, cannot at all be defined. It is so elementary, that it is impossible to resolve it into any notion more simple than itself. But while consciousness cannot logically be defined, it may still be philosophically analyzed. The forms under which this condition of all The forms under which this condition of all thinking operates, are—I know that I know, I know that I feel, and I know that I desire; or, in other words I am conscious that I know, feel, and desire. And while this is so, the act necessarily involves, (1) a knowing mind, (2) a know object, (3) a recognition by the mind of its object. It accordingly appears that consciousness and knowledge mutually involve each contact they are not opposed as really diverse. It is somewhat remarkable, that a term in all ways so important and convenient should have escaped the subtle Greeks and the rhetorical Latins, and that it should have been reserved for Descartes, a Frenchman, to introduce the term conscientia, or consciousness, in its modern signification. An instance or two of the modern use of the word may, no doubt, be found in Quintilian and the Latin fathers; but no consistent adoption of it is to be met with before the time just specified. Among the Romans, if two individuals or more had a common knowledge of some circumstance. such a knowledge was called conscientia, or (con-scio) knowledge together with; but, except this, the term was always employed in a moral sense, as equivalent to our word conscience. The general conditions that attach to consciousness, in its modern acceptation, are obvious and palpatle:—1. That the knowledge which it obvious and palpable:—1. That the knowledge which it implies is actual, and not merely potential. For example, if I say of my friend that he knows the shape of the reading-room in the British Museum, that it is round, and not square, I mean that he is not conscious of the fact at the present moment, but that he may be rendered conscious of it by having his attention drawn to the circumstance. We are, in truth, conscious only of the present. 2. The knowledge which it implies is immediate, and not distant. Thus, while I am con-

# Conscription

scions of the dome of St. Paul's while I look at it, I am unconscious of it when it is out of my mind, having to ransack the arcans of memory to bring it up into consciousness as often as I wish to recall it. Again the 3rd place, I am only conscious in so far as I Aguin, in conscious of some definite object, as contrasted either with no object, or with another object different from the present one in its qualities and modifications.
Thus, suppuse I am conscious of the desk at which I write, I am only so as taking the present desk in contrast with some other supposable desk, such as the one at the British Muscum, at which many men ar accustomed to write at the same time. In the 4th place, there is always judgment in every act of con-sciousness, or the affirmation or negation of one thing being or not being, having or wanting the qualities of another. We cannot, in truth, discriminate without judging; so that this fourth condition might stand as a corollary to the third. Every act of mind, in fruth, implies a judgment, as every act of consciousness implies an act of affirmation or negation. The 5th undeniable act of consciousness is memory; for I can-not be conscious of an object without discriminating it from another state of mind to which the present one was only a successive phenomenon. I must distinguish all the separate acts of consciousness, and I can only distinguish them by the aid of memory, as I can only discriminate them by the help of judgment. As the fourth condition of consciousness, this one holds the position of being a second corollary to the third. Hutcheson, Reid, and Stewart, expose themselves to criticism by affirming this faculty to be special in its operation, and not general. They affirm, in short, that it is possible to read a book, and to know that we have read it, without being conscious at the same time of some portion of its contents; nay, that it is possible to be conscious of the perception of a book without being aware that it is a book that we perceive. There can only be a system of philosophy in so far as the veracity of consciousness is implicitly or explicitly affirmed by it. Philosophy, accordingly, in asserting affirmed by it. Philosophy, accordingly, in asserting its own possibility, asserts, in the same breath, the truthfulness of consciousness. Leibnitz truly has remarked, in his Nouveaux Essais (lib. ii. c. 27, s. 13), that "if our immediate internal experience is not certain, there can be no truth of fact of which we can be assured. All speculators agree in this, both sceptical and dogmatical. But not only is consciousness the evidence and authority of all legitimate speculation, it is likewise the source and spring from which it flows. As the criterion of philosophy, it must be clear and unadulterated; and hence there emerge three great laws that regulate its legitimate development. These are,—lst, that it be charged with no fact but what is simple and ultimate; 2nd, that all the facts ascribed to consciousness be taken without reserve in coming to any conclusion; and 3rd, that nothing but the facts, or what these data imply, be accepted as legitimate in any process of inquiry. As one illustration of the fertility of accepting or of rejecting these leading laws, may be mentioned the circumstance, that on the duality or unity of the first fact of consciousness hangs altogether the entire system of speculation which any inquirer may adopt. If, in saying that I perceive a stone, I do not recognize that there are two independent objects in this act, my perceiving mind, and the stone which I perceive, as two separate independent existences, but maintain with Berkeley and Fichte and Ferrier, that what seems a stone is not really a stone, but only a mode of my mind or of some other mind, then I deny the duality of the substances and assert their unity. And if I do so, I deny the doctrines of realism and accept those of idealism, and, possibly, of partheism. We have only spoken of the partial rejection of the veracity and integrity of the facts of consciousness; something might also be said on the total rejection of those facts, which leads to the specu-lative dootrines of nihilism at the first remove.—(For further illustration on this point, see Reid's Works, by Sir William Hamilton, p. 748.)
CONSCRIPTION, kon-krip'skun (Lat. conscribere, ta

enrol), the name given to the compulsory system of enlishment of soldiers for the army, practised in France. and other foreign countries. Every Frenchman, as soon as he attains the age of 20, is liable to be drawn

### Consecration

Consols

by lot to serve in the ranks for seven years, unless he be incapacitated by any bodily or mental infirmity, or exempt, from being the only sen of a widow, or the eldest son of a family that are left without parents. Pupils at college, and those who are studying for the church, are also exempt, as well as those who have a brother already in the army; and no man is taken at present who is under 5 feet 2 inches in height, although during the Penineular war, the standard height in the French army was only 4 feet 11 inches. In France about 200,000 yearly attain the age of 20, and become hable for service. Those who are exempt from any liable for service.

cause are not reckoned in this calculation.

CONSECRATION, kon-se-krai'-shun (Lat.), the solemn act of dedicating any person or thing to a divine service or use. In modern times the consecration of men is usually called ordination, and that of temples, churches, attars, &c., is called dedication. Consecration was one of the most universal religious ceremonies of the ancients. It was practised in India, Egypt, Judea, Chaldra, Greece, Rome, among the Celtic Druids of Britain, and in Europe generally. At the commencement of the Mosaic dispensation, all the first-born of man and beast were consecrated to the Lord. Subsequently the whole tribe of Levi were consecrated, and Asron and his sons were especially consecrated to the priest's office. In the Old Testament there is a depriest's office. In the Old Testament there is a description of the consecration of the tabernacle and altar, of the first or Solomon's temple, and also of the consecration of men, beasts, houses, fields, and the walls of Jerusalem. It was not until the commencement of the 4th century, when Christianity, under Constantine, became the religion of the Roman state, that churches were publicly consecrated. The ceremony was then attended with great pomp and splendour.

The practice of consecrating buildings for religious purposes is still continued in the Church of England as well as in the Church of Rome. In the Euglish church the burial-ground is also consecrated.

CONSECRATION OF A BISHOP, is the separating of a person for the holy office of a bishop, by imposition of person for the nony office of a bishop, by imposition of hands and prayer. According to a cannon of the Niceue council, there must be four, or at least three, bishops present at the consecration of a bishop. The ceremony used in the Church of England will be found in the Book of Common Prayer: it was prepared in the reign of Edward VI. It is stated in the preface, that "no none shall be accounted or taken to be a bishop, or suffered to execute the same function, unless he be called, tried, and admitted thereunto, according to that form, or hath had formerly episcopal consecration." The Church of Rome denies the validity of the English rae church of home denies the validity of the rights orders generally, as derived from heretical and improperly-consecrated bishops. An old story, refuted by Lingard, a Roman Catholic historian, is known by the name of "the Nag's Head Consecration." It is asserted that Archbishop Parker was consecrated at the Nag's Head the Nag's have of the Particle Parker was consecrated at the Nag's the Nag's the Particle Parker was consecrated at the Nag's the Na head tarendshop ranker was consecrated at the Mag s. Head tavern, Cheapside, by one of the Protestant bishops laying a Bible on his head, and saying, "Take thou authority," &c. According to Lingard, the whole story was false, as Parker was consecrated by the bishops of Bath, Chichester, and Exeter, at the chapel at Lambeth. The bishop of Bath had been consecrated according to the Roman Catholic pontifical, in the reign of Henry VIII. The story probably arose from the fact that the commissioners who ratified Parker's election dined at the Nag's Head, a tavern much occu-

pied by country clergymen. Consecuation of Churches.--All churches in this zountry must be consecrated, as the law recognizes no place as a church till it has been consecrated by the bishop. The ceremony was formerly one of great bishop. The ceremony was formerly one of great solemnity and grandeur. During the sitting of the Long Parliament, Alderman Pennington presented a petition, in which the consecration of churches was included among "the manifold cvils, pressures, and included among "the manifold evils, pressures, and grievances caused, practised, and occasioned by the prelates and their dependents." At the Restoration, the practice of consecrating churches, which had been abolished, was resumed, and since that time each bishop has adopted any form he thought best; though, the first of consecrating churches, changles perhaps, the form of conscorating churches, chapels, and burying-places, which was sent down by the bishops to the lower houses of convocation (1712), and altered by a committee of the whole house, is the one

-not that it is enjoined by any competent authority now most generally used.

CONSECRATION OF THE ELEMENTS. (See EUCHA-RIST.)

CONSEQUENCE, kon'-se-quens (Lat. con, and sequor, I follow), is that which follows or results from any cause, act, or principle.—In Log., it is applied to the conclusion of a syllogism, or that which results from the premises.

CONSERVATIVE, kon-serv'-a-tiv (Lat. con, and serve, I keep or guard), in a political sense, is one whose sim it is to preserve from innovation or radical change the existing institutions of the country, both civil and ecclesiustical; and hence he is opposed to such measures and changes as he believes to tend in that

direction. (See TORY.)

CONSERVATORY, kon-ser'-va-tor-e (Lat. conservare, to preserve), a glass house for the reception of tender plants that require protection from the wind, frost, and rain. A conservatory requires a little artificial heat from a stove placed within it in winter only; and this constitutes the chief point of difference between the conservatory and hothouse, which is heated by pipes, and an apparatus for the transmission of hot air, throughout the year, as well as by a bark bed. Con-servatories are often rendered an ornamental feature in a building when attached to it and connected with one of the principal apartments, or forming the entrance.—Ref. Beeton's Book of Garden Management.

CONSIDERATION, kon-sid-e-rai-shun (Lat. consideratio), in Law, is the material cause of a contract, without which it cannot bind the party. The consideration is either expressed or implied. The latter is when the law itself enforces a consideration; as, if a man goes into a common inu, and, staying there some time. takes meat or lodging either for himself or his horse, the law presumes he intends to pay for both, notwithstanding there is no actual bargain or contract between him and his host. Also there is a consideration of nature and blood, and a valuable consideration; and therefore, if a man be indebted to divers others, and, in consideration of natural affection, gives his goods or estate to his son, this is a fraudulent gift us against the creditors (unless it be upon, or in consideration of, his marriage), because this act intends a valuable conaideration.

CONSISTORY, kon-sis'-tor-e (Lat. consistorium), was CONSISTORY, Kon-sur-ore than consistent, coriginally applied, under the later Roman emperors, to the place in which their privy council met, and afterwards to the covacil itself. When the Roman church was established, this form of court was adopted by the ecclesiastical power, and, down to the present time, the highest council of state in the Roman govern-ment is called the consistory. The ordinary consistory, which is composed only of cardinals, and over which the pope himself presides, meets once a week in the papal palace, for the transaction of general business connected with the Church, the election of cardinals, bishops, and the like. Extraordinary consistories, or, as they are called, secret consistories, may be summoned at any time by the pope, as occasion may require. The Protestant churches on the continent have also their consistories, which manage the affairs of the Church. In England the consistory is a spiritual court formerly held in the nave of the cathedral church, or some chapel or aisle belonging to it, in which the bishop presided, and had some of his clergy which the disapp presided, and had some of his clerry for assessors and assistants. This court is now held by the bishop's chancellor or commissary, either in the cathedral church or other convenient place in the diocese for hearing and determining ecclesiastical causes.

CONSOLE, kon'-soal (Fr. console), in Arch., a richlyornamented bracket in the form of a corbel (see Corbert), fastened to a wall to form a support for busts, statuettes, candelabra, &c., or used to support a cornice as a modilion. The name console-table is applied to a semicircular table projecting from the applied to a semicircular table projecting from the wall, and supported on brackets terminating in a solid foot, or fixed to the wall. There are other forms of console-tables, but this is the most common. Consols, kon-sols, a Sontraction of the term Consolidated Annuities. The British government, during the process of borrowing the money which now forms the patient debt in the patient debt in the patient debt.

the national debt, laid themselves under certain special

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# Consonant

conditions; these conditions generally consisted in an undertaking to pay an annuity of so much per cent. On account of the complication and confusion which on account of the complession and contract which were consecuted in 1737 the Consolidated Annuities Act was passed. By this statute an average of the value of the different stocks was struck, and the whole consolidated into one fund, kept in one account at the Bank of England

CONSONANT, kon'-son-ant (Lat. con, and sono, I sound), in Gram., is a letter which cannot be sounded by itself without the aid of a vowel placed either before or after it.

CONSORT, kon'-sort (Lat. consors, from con and sors, lot), is literally one who throws in his lot with another; a companion or partner in an undertaking; a husband or wife. By the law of England, the queen consort, the wife of the reigning king, is, in all legal proceedings, looked upon as a single, not as a married woman She may purchase and convey lands, grant leases, and do other acts of ownership without the intervention of the king. She may also sue and be sued in her separate person, and possesses courts and officers distinct from those of the king. She pays no toll, and is free from any fine which a court could impose upon women in general; but in other respects she is on a similar footing with the other subjects of the king. In her life and person, however, she enjoys the same protection as the king, it being high treason to design the death of either. The husband of a queen regnant is not endowed by the constitution with any distinctive rights or privileges. All his privileges and honours, therefore, must emanate from the crown under the form of warrant, grant, patent, &c., or else be con-ferred by act of parliament introduced after a royal message on the subject. Up to 1857, when the title of Prince Consort was bestowed upon him by letters patent, the late Prince Albert possessed no distinctive title and no place in court ceremonial but such as was accorded to him by courtesy.

Secorded to him by courtesy.

CONSTABLE, Expl-skli-bl (Old Fr. connestable; Sax.

cuning or cying, and staple, the stay or hold of the king;

Lat.comes stabult, literally, head of the stables), an officer

who supports the queen by the maintenance of her

peace. The office of lord high constable has been disused

in England, except only upon great and solemn occa
sions. Such as the coronation and the like, ever since sions, such as the coronation and the like, ever since the attainder of Stafford, duke of Buckingham, under King Henry VIII.; as in France it was suppressed about a century after, by an edict of Louis XIII. The office of high or chief constable was established in England by Edward 1. (stat. Winch, 13 Edw. I.). He appointed two in every hundred to view the armour of every person within the same, to present all such defaults before the justices; to present the defaults of tourns, of highways, and of such as lodged strangers in uplandish towns for whom they would not answer. Their powers were, by several acts of parliament, enlarged, and they are now conservators of the public peace in their hundreds, as the petty constables are in parishes; and they serve precepts or warrants on certain occasions, and return the list of jurors. They are appointed at the courts leet of the franchise or hundred over which they preside, or, in default of that, by the justices at their special sessions. Petty constables, or parish constables, seem to have been first appointed about the beginning of the reign of Edward III., to alleviate the burthen of the chief constable. They are now appointed by the justices under 5 & 6 Vict. c. 109; and by that act it is declared that the leet shall appoint no constable except for the performance of duties unconnected with the public peace. Their principal duty is the preservation of the peace and the service of the summonses and the execution of the warrants of the justices of the peace, to them directed, relative to the apprehension and commitment of offenders. Special constables are persons appointed on particular occasions by the magistrates, who have

# Constitution

the grand ducky of Baden, Germany, between 1414 and 1418. It was summoned at the request of the emperor Signature of the second of the great schem in the Church arising from the contest between John XXIII., Gregory XII., and Benedict XIII. for the papal chair: and also to prevent the spread of the doctrines of John Huss. There were assembled, besides the emperor and Pope John XXIII., twenty-six princes, one himdred and forty counts, twenty cardinals, seven patriarchs, twenty archbishops, ninety-one bishops, six hundred prelates and doctors, and about 4,000 priests This council deposed the three rival popes, and elected. Martin V. as head of the Church, and tried and condemned to the stake both John Huss and Jerome of

CONSTANTINOPOLITAN HISTORY. (See BYZANTINE

EMPIRE.)

CONSTELLATION, kon-stel-lai'-shun (Lat. con, to-gether; stella, a stur), in Astron, the name given to large clusters of stars which occupy a considerable space in the field of the heavens, and are distinguished by names and grouped within fanciful outlines of men, animals, and things, principally derived from persons and incidents mentioned in the mythology of the Greeks and mondents mentioned in the mythology of the treess, and Romans. Aratus and Ptolemy among the ancients, and Bayer, Helvetins, and Lacaille, in more modern times, are the principal astronomers who have grouped the stars into constellations. Tycho Brahe, Lemonnier, Bezobut, and Halley, have added five more, which are recognized. Many more have been named by these and other astronomers, which are not admitted into the list of acknowledged constellations. Bayer commenced the notation of the stars in the various constellations by the Greek alphabet, marking the brightest star by the first letter, and so on; and when there were more stars than Greek letters, he denoted the rest by small italics. The stars were numbered in each constellation by Flamsteed, in the order of their right ascension, and this is the plan smally adopted in the catalogues of Bradley, Lacaille, and others. There are forty-eight constellations given by Aratus and Ptolemy, which are depicted on the by Aratis and Trotein, which are depleted on the celestial globe and in star maps; but as many more have been added since the time of Ptolemy, some of which are rejected; so that the acknowledged number is about ninety. The principal constellations are noticed under their respective titles.

Constitution, kon-stip-at-shun (Lat. constitution constitution, 1 crowd together), in Med., is a torpitude or sluggishness of the howels, occasioned by an excessive action of the absorbents of the bowels, or defective secretion of the juices of the intestines, by which the frees become hardened, or by an impaired peristaltic action of the intestines. (See Digestion.) It arises most frequently from a deficiency or vitiated secretion of the bile, which is the natural stimulus of the bowels. Sedentary habits predispose to constipa-tion, as does also the use of certain kinds of food. When severe and obstinate, it gives rise to inflammation of the bowels, and may soon prove fatal. The treatment consists in moving the bowels by means of purgatives, and then restoring the natural state of the system by means of active exercise in the open air, seabathing and the use of food of a laxative nature; as

brown bread, green vegetables, &c.
CONSTITUENT ASSEMBLY, in French Hist. (See

ASSEMBLY, NATIONAL.)

CONSTITUTION (Lat. constitutio, from con, and statue, I set, fix, or appoint), in a general sense is an ordinance, regulation, or law, made by authority of a superior, either civil or ecclesiastical. The decrees and decisions of the Roman emperors were called constitutions, and in the Roman church this name is

given to a decree of the pope in matters of doctrine.

Constitution in a political sense is the established warrants of the justices of the peace, to them directed, relative to the apprehension and commitment of offenders. Special constables are persons appointed on particular occasions by the magistrates, who have power to appoint and swear in as many householders or others as they may think fit, who have no legal exemption from the office of constable. County and district constables are appointed by the justices under the 2 & 3 Vict. c. 93, and 3 & 4 Vict. E. 89. (See Policia.)

Constance, Council of, kon-sidins, a celebrated ecclesiastical council held at the city of that name in 553. been divided into three kinds:—(1) those established by the sovereign power; (2) those springing out of rights enjoyed by the people, or certain classes of them, and which form conditions in the contract between the sovereign and the people; and (3) those founded on compact between different sovereign powers. The first class may again be divided into those established by a free sovereign people for their own regulation, and those that are granted by monarchs to their subjects. In regard to political principles, constitutions are—(1) democratic, where the sovereign power is vested in the body of the people; sovereign power is vested in the body of the people; (2) aristecratic, when the government is chiefly or entirely in the bands of certain privileged classes; (3) monarchical, when in the hands of one person; and (4) of a mixed character, as in Britain, where the sovereign power is distributed over the king, lords, and commons. Constitution always implies a sovereign power, whether that be vested in one or many, in one supreme ruler, or in all the male population above a certain age.

CONSTITUTION, kon-stit-tu'-shun in Med., is used to denote the general condition of the body, as evinced by the peculiarities in the performance of its evanced by the peculiar predisposition to certain diseases, the liability of particular organs to disease, varieties in digestion, in muscular power and motion, in aleep, in the appetites, &c. Some marked peculiarities of constitution are observed to be accompanied with certain external characters, such as a particular colour and texture of the skin and huir, and also with a peculiarity of form and disposition of mind. These have been observed from the earliest times, and have been divided into classes. (See TEMPERAMENT.)

CONSTITUTIONS AND CANONS. (See CANONS OF THE CHURCH OF ENGLAND.)

CONSTITUTIONS APOSTOLICAL. (See APOSTOLICAL CONSTITUTIONS.)

CONSTITUTIONS OF CLARENDON. (See CLARENDON,

THE CONSTITUTIONS OF.)
CONSUBSTANTIAL, kon-sub-stün'-shül (Lat. con, and substantia, substance), a term used in Theol. to denote something co-essential, or of the same substance, with sometiming co-essential, or of the same substance, with another. It is generally employed to designate the belief that the Son of God is of the same essence with the Father, and was first adopted by the council of Nice to express the orthodox doctrine, and to serve as a barrier against the errors and subtilities of the Arians, who denied this doctrine. The Greek term is homoousios.

Consubstantiation, or Impanation, kon-sub-stan-she-ai-shun, im-pan-ai-shun, is employed to designate the doctrine of the Lutheran church regarding the presence of Christ in the Eucharist, as opposed to trensubstantiation, the docrine of the Roman church. While the Romanists bold that the bread and wine of the Sacrament are changed into the body and blood of our Lord, Luther and his followers attempted to solve the mystery by maintaining that, through the conse-cration of the elements, the real body and blood of our Lord became united therewith, and were thus par-taken of by the recipients. This doctrine was first introduced into the Church about the end of the 13th century, by John, surnamed Purgens Asinus, a doctor of Paris, and is still held by Lutherans.

Consult, kon'-rul, in Pol., is a public officer appointed by a government to reside in some foreign country, in order to facilitate and protect the commercial relations between his own country and that to which he has been sent. This class of officers seems which he has been sent. This class of officers seems to have been created by the Italian states about the 12th century. Taking advantage of the crusades, they procured permission from certain Asiatic princes to send persons into their territories as protectors of their merchants going to these parts. Their example was gradually followed by other European nations, and by the 16th century the system was generally established over Europe. The right of sending conand by the 16th century the system was generally established over Europe. The right of sending consumed productive consumption. Commodities are consumed productively when the advantage or benefit, widely in different states. In general, the duty of a consumed unproductively when such advantage or consumed productively when the advantage or benefit, widely in different states. In general, the duty of a consumed unproductively when such advantage or consumed in the advantage or consumed unproductively when the advantage or consumed productively when the advantage or consumed unproductively when the advantage or consumed unproductively when the advantage or benefit is less than their value.

Consumed productive consumption. Commodities are consumed productively when the advantage or benefit is less than their value; and they are consumed unproductively when the advantage or benefit, and they are consumed unproductively when the advantage or benefit is less than their value; and they are consumed unproductively when the advantage or consumed unproductively when the advantage or benefit, and they are consumed unproductively when the advantage or consumed productively when the advantage or benefit, and they are consumed productively when the advantage or benefit, and they are consumed productively when the advantage or consumed productively when the advantage or benefit, and they are consumed unproductively when the advantage or consumed unproductively when the advantage or consumed unproductively when the advantage or benefit is less than their value; and they are consumed unproductively when the advantage or consumed unproductively when the advantag

other subjects; to prevent their infringement of the laws; to reconcile their differences, uphold their intelaws; to reconcile their differences, uphold their interests; and generally to ronder the condition of the subjects of the country employing him within the limits of his consulship as comfortable, and their transactions as profitable and secure, as possible. Consuls occasionally partake of a certain kind of diplomatic character; and in Turkey, according to an ancient treaty and certain by-laws of the Levant Company, British consuls enjoy extensive judicial powers. A British consulis expected to be master of the language of the country in which he resides, and to have a of the country in which he resides, and to have a knowledge of its laws and regulations, particularly such as relate to trade; to procure and send home statistical returns connected with commerce, and the prices of produce and provisions; and to report any in-lections disorders that may be within his district. Con-suls are sometimes natives of the countries in which they reside, but more frequently of the countries which they represent. All British consuls holding a royal commission are subjects of Great Britain, but many of the vice-consuls are not so. The emoluments of British consuls were formerly derived chiefly from fees, which depended upon the tonnage, number, value of cargoes, &c., of the British vessels entering and leaving the limits of their consulship; but now their fees are very inconsiderable, arising from notarial acts, certificates &c.; and, in addition, they have in many cases fixed salaries from the crown. In some cases they are allowed to engage in trade; in others they are interdicted from it. In most cases the salary is small, but in some it is as high as £1,600 or £1,800 a year. There are English consuls or vice-consuls at all the chief ports with which the nation has commercial relations. In with which the nation has commercial relations. In some countries, where there is no superior diplomatic agent, a consul-general is appointed, who is, sometimes, accredited as a political agent, with the rank of chargé d'afaires, and is resident at the scat of government. The total number of British consuls-general, consuls, and vice-consuls is about five hundred, of whom about one-half receive salaries. The government estimate of salaries to these for 1860-61 was £129,229.

CONSUL, the highest ordinary magistrate in the

ancient Roman republic. Consumption, in Med.

CONSUMPTION, in Med. (See PHTHISIS.)
CONSUMPTION, kon-sumpl-shun (Lat. consumptio), in Pol. Econ., is employed as opposed to production. It does not mean the consumption or annihilation of matter, that being as impossible as its creation, "but the consumption or annihilation of the qualities which render commodities useful and desirable. To consume the products of sit or industry, is to deprive them of the utility, and, consequently, of the value communi-cated to them by labour." "We produce commodities only that they may be used or consumed. Consump-tion is the end and object of human industry; pro-duction is merely a means to attain that end."—(J. R. McCulloch.) In this sense, then, consumption is synonymous with use, and is the end or object of production. "It would be an improvement," says Professor Senior, "in the language of political economy, if the expression 'to use' could be substituted for that of 'to consume.'" "That almost all that is produced is destroyed, is true; but we cannot admit that it is produced for the purpose of being destroyed. It is produced for the purpose of being made use of. Its destruction is an incident of its use not only not intended, but, as fur as possible, avoided." In every beatthy condition of secient there is always a natural intended, but, as far as possible, avoided." In every healthy condition of society there is always a natural relationship maintained between production and consumption. The greater the consumption, the greater the stimulus given to production. There will always be an excess of production over consumption wherever the course of industry is not impeded by bad laws. Political economists distinguish between productive and variety decise consumption. Commodities

# Continent

a healthy body by actual contact with the sick, or with the palpable matter from their bodies, and infection to be applied where disease is communicated through the medium of the atmosphere, or by means of other intermediate substances, called fomites. This distinction, however, is frequently lost sight of, and the term contagion applied to all cases in which the discase is conveyed to the person of the recipient by par-ticles of matter proceeding from the person of the sick, whether these particles are in a solid or a gaseous form, whether they are imparted by direct contact of the two bodies, or by being wafted through the air, or carried upon articles of clothing. There are two kinds of contagious diseases: (1) Those that can only be comminguised by direct contact as each problem and the direct contact as each problem. municated by direct contact, as itch, syphiliz; and (2) those which are capable of being produced either by direct contact or without it, as small-pox, typhus fever, &c. Some contagious diseases seem to effect some radical charge upon the contact. some radical change upon the system, so that it is not again liable to attack from the same disease, as smallpox; and some diseases, that do not generally manifest any contagious disposition, do occasionally, under unfavourable circumstances, assume a malignant and contagious form. The term contagion is also applied to the poisonous matter by means of which the disease is communicated. In this latter sense, it is a morbifle matter sui generis, which, on entering the blood, produces a definite train of morbid phenomena, and communicates to the blood the property of generating a similar poison capable of producing precisely the same disease,

CONTINENT, kon'-tin-ent (Lat. con, and tenens, holding), a large tract or division of land not separated by the sea from other lands, or a connected tract of land of great extent, whether an island or not. The surface of the earth is divided into five continents, which are generally recognized; namely, Europe, Asia, Africa, America, and Australia.

CONTINENTAL SYSTEM, kon-te-nen'-tal, was a plan devised by Napoleon to exclude Britain from all intercourse with the continent of Europe, in order to comcourse with the continent of Europe, in order to compel her to acknowledge the maritime law established at the peace of Utrecht. This system began with the famous decree of Berlin (Nov.21,1806), which declared the British islands to be in a state of blockade; all commerce, intercourse, and correspondence, at an end; every Briton found in France, or a country occupied by French troops, a prisoner of war; all property belonging to Britons fair prize, and all trade in British goods entirely prohibited. Britain immediately directed perspeals are the decree and by an on Drusa goods entirely prohibited. Britain immediately directed reprisals against this decree, and by an order in council of 7th January, 1807, she prohibited all neutral vessels from cailing to any port belonging to France or her allies, or to one of any nation so much under her control that British vessels could not have introduced with it. have intercourse with it. Every neutral vessel which should violate this order was to be confiscated with her cargo. A second decree of 11th November, 1807, was still more severe against neutral commerce. this, all harbours and places of France, and her allies in Europe and the colonies, as likewise every country with which Britain was at war, and from which the British fing was excluded, were subject to the same restrictions as if they were closely blockaded; all commerce in the manufactures and productions of such countries was prohibited, and vessels engaged in such commerce were to be confiscated; as also all those reseels whose certificates showed that they were built in the enemy's country. Another order in council declared the sale of vessels to neutrals by the enemy unlawful, and the intended transfer of property void. These orders were followed by reprisals on the French side. By a decree of Milan, of 17th December, 1807, atrengthened by a decree of the Tuileries of 11th January, 1808, every vessel, of whatever flag, which had been searched by a British vessel, and cousented to be sent to Britain, or had paid any duty whatever to Britain, was to be declared denationalized, and to have become British property, and as such a good prize. In order more effectually to annihilate British prize. In order more enectually to annihilate British commerce, the turiff of Trianon respecting colonial goods was proclaimed 3rdsAugust, 1819, which was extended by a decree of 12th September, and on the 18th October was followed by the decree of Fontaine-bleau, which directed the burning of all British goods.

#### Contract

These decrees were to be carried out, with more or fewer modifications, in all countries connected with France. The consequence was, that the price of colouisl and foreign goods rose enormously on the conlomial and foreign goods rose enormously on the con-tinent; a regular smuggling trade was carried on at different points; numerous substitutes for colonial goods, particularly coffee and sugar, were invented; and a variety of manufactures grew up on the con-tinent which were the germs of very extensive and flourishing branches of industry. On the breaking up of Napoleon's power, the so-called continental system fell to the ground fell to the ground.

CONTINGENT, kon-tin'-jent (Lat. con, and tange, I touch), in Pol., is the name given to the quota of troops to be furnished by each member of a number of

states composing a confederation.

CONTINGENT LEGACY. (See LEGACY.)

CONTINGENT REMAINDER. (See REMAINDER.)
CONTINGENT USE. (See USE.)
CONTOUR, kon-toor' (Fr. contour, from Lat. conforquere, to bend or twist), a name which is sometimes given to the outline by which any figure or form is defined or expressed. It is also applied to the coasi-line of a country and the undulations of its auxiliary referring chiefly in the latter case to the outline of kill and dale obtained by making a section of it in any direction. We often speak of the contour of a figure, and associate it with an outline consisting of beauti fully rounded curves rather than with one which is full

of abrupt turns and angular projections.

Contraband, kon triband (Ital contrabands; Lat. contra, against, and bannum, proclamation), in Comi, is applied to all goods or wares exported from or imported into, any country against the laws of said

country.

CONTRABAND OF WAR, is a designation applied to certain commodities useful in war, which, by the law of nations, neutrals are prohibited from carrying to beligerent states. According to Vattel, "such are arms, ammunition, tabler for shipbuilding, every kind of naval stores, horses, and even provisions in certain inventions. junctures, when we are in hopes of reducing the enemy by famine." There is great difference of opinion by famine." There is great difference of opinion among authorities as to what are and what are not contraband of war, and the usage among nations has been equally fluctuating. Grotius divides commodities into three classes: (1) Those which are useful only for the purposes of war; (2) those which are not so; and (3) those which are susceptible of indiscriminate use both in war and peace. The first he, with all other authorities on the subject records as attickly contraauthorities on the subject, regards as strictly contra-band of war, and prohibited from being carried by neutrals to the enemy; the second he permits to be so carried; and the third, such as money, provisions, ships, and naval stores, he sometimes prohibits and at other times permits, according to the existing circumstances of the war. Of the same nature with contraband goods is the carrying of military persons or dis-patches in the service of the enemy. The dispatches of an ambassador or other public minister of the enemy resident in a neutral country are excepted. In general, where the ship and cargo do not belong to the same person, the contraband articles only are confiscated, and the carrier-master is refused his freight to which he is entitled upon innocent articles which are condemned as enemy's property. Under the fraudulent circumstances of lalse papers and false destination, the ship as well as the cargo is liable to confiscation. Where the ship and the contraband articles belong to the same person, they are involved in the same

CONTRACT, kon'-trakt (Lat. con, traho, I draw). The subject of contract (Lat. con, train, 1 draw).—
The subject of contracts is partly treated under the
head of AGREEMENT. In addition to what is there
stated, it may be remarked that contracts are express
or implied, the terms of the former being openly,
uttered and avowed at the time of the making; the latter rest on a mere construction of law, and in general it will be implied that a men actually promises to fulfil that which he ought to fulfil. (See BAILMENT.)
Where there is an express promise, the law does not raise an implied one in reference to the same matter,for expressum facit cessare tacitum; and where there is a contract by deed, no express parole promise to the same effect and upon the same subject can coexist with

### Contraction

it, for the contract by specialty merges or extinguishes that by parole. A parole contract may be either written or verbal. A contract may be either executed, as if A. agrees to change horses with B., and they do it immediately, in which case the possession and the right are classety, in which case the possession and the right are transferred together; or it may be executory, as if they agree to exchange next week; here the right only vests, and their reciprocal property in each other's horse is not in possession, but in action; for a contract executed (which, when it relates to an exchange or sale of goods, differs in nothing from an assignment) conveys a chose in possession; a contract executory conveys only a chose in action. (See Chose in Action.) A promise by parole only is not binding in law, unless made upon a consideration, or some compensation or quid pro quo, to be reciprocally afforded by the promisee. As a general rule, the adequacy of the considera-tion is a question that the law will not entertain, provided a consideration of some value shall appear to ave existed. (As to a contract by deed, see DERD.) There are some rules applying indifferently to all kinds of contracts. They relate to the capacity of persons to contract, and to the construction and performance of contracts when made. Those which relate to capacity principally concern the condition of insanity, drunkenness, infamy, coverture, and duress. (See the references under the article Caracity, Legal.) In addition to the matter explained under the heads of subjects so referred to, it may be stated that a person drunk, to the extent of complete intoxication, so as to be no longer under the guidance of reason, is absolutely incapable, while that condition lasts, of entering into a valid contract. The rules which govern the construction or interpretation of a contract when made will be mentioned when we consider the article DEED, as the same laws of construction apply in general both to sealed and unsealed agreements. The performance of sealed and unsealed agreements. The performance of a contract cannot be enforced if the contract be founded upon an immoral or illegal consideration, or be obtained by fraud, or, if good at the time of making it, the per-formance becomes illegal by a subsequent alteration of the law, or if the promisee on his part has failed to perform the consideration. But, on the other hand, no excuse is in general afforded by the circumstance that what a man absolutely engaged to do has since become impossible, for it was his own fault to make an unconditional contract. Yet, if the performance be hindered by the opposite party, the case, of course, is different, and the party making the engagement

excused. CONTRACTION, kon-trük-'shun, in Gram., is the short-ening of a word by the omission of a letter or syllable. The Greek language abounds with contractions, which have been adopted chiefly to avoid a harshness in the pronunciation arising from the concurrence of two rowels in two successive syllables or words. Hence two or more simple vowels coming together are usually contracted into a diphthong. This is said to be proper when the vowels are contracted without change into a diphthong; improper, when, in the contraction, a vowel or diphthong of a different sound is substituted. Elision takes place when two vowels at the end of one and at the beginning of another word come together, and the final wowel of the first word is rejected, its place being marked by an apostrophe placed over the consonant which is left. This takes place chiefly with the poets. Crasis is that kind of contraction in which two words coalesce into one, and are accented as one, with-out any elision. In synizesis two vowels are contracted into one sound-not in writing, but in pronunciation. In the Middle Ages, before the introduction of print ing, numerous contractions were resorted to for the purpose of abbreviating the labour of transcription. In many of the arts and sciences contractions are still common. (See ABBRYIATIONS.)

Contradiction: Propositions, kon-tra-dik'-tor-c
[Let. contradictio], in Log., are the opposities of each
other, the one being a mere and naked denial of the
other. To be truly contradictory, they must have the
same terms, and differ both in quantity and quality,—
the one denying and the other affirming the same
thing of the same subject considered in the same cirsummissiones.

CONTRALTO, kon-trall-to (Ital.), in Mus., is a term em-

### Convention

that part in the score whose range of tones lies between that of the tenor and that of the soprano or trable, also called the alto or counter-tenor.

CONFRIET PROPOSITIONS, kon-tra-re-[Lat. contrarius], in Log., are universal propositions, one of which affirms and the other denies the same predicate of the same subject. They differ in quality, but not in quantity, and, therefore, are distinguished from contradictory propositions, which differ both in quantity and quality.

Contrition, kontrish'un (Lat., from contero, I break or bruise), in Theol., is deep sorrow for sin, arising from the thought of having offended an infinitely holy and benevolent God. It is usually understood to mean genuine repentance, and to be accompanied with a detestation of sin and of oneself on account of it

CONTROLLER, or COMPTROLLER, kon-kroal'-er (Norm.), is an officer appointed to control, over-see, or verify public accounts; as the comptroller of the royal household, whose duty it is to examine and check the expenses of the household. He is usually a member of the privy council, and a political adherent of the government in power. The comptroller-general of the exchequer has the control and record of the receipts and payments of the public revenue of the United Kingdom, and the preparation and issue of exchequer bills. He is incapacitated from holding any other office under the crown, is appointed by letters patent, and holds his

office during good behaviour.

CONUNDRUM, ken-un'drum, a sort of riddle, in which
some quaint or odd resemblance is proposed for discovery between things perfectly unlike; as, for instance,
Why is a whisper like a forged bank-note?—Because
it is uttered but not not allowed (aloud).

CONVENT, kon'-cent (Lat. conventus, from con and vento, I come), is applied both to a community of religious persons, whether monks or nuns, and to the abbey, monastery, or nunnery in which they reside. (See MONASTERY NEWS.)

abbey, monsstery, or numery in which they reside. (See Monasterx, Nuns. Convent, denoting properly a cabel, or secret assembly, of a part of the monks of a convent to form a party in the election of an abbot. It is said by some to have been first applied in England to the schools of Wickleiffe, and has since been used by way of reproach for those religious assemblies which dissent from the established church. In 1664, what is called the Conventicle Act was passed, decreeing that if any person or persons above sixteen years of age were present at any meeting for worship different from the Church of England, where there should be five persons more than the household, they should, for the first offence, suffer three months imprisonment, or pay £5; for the second the punishment was to be doubled; and for the third they were to be banished to America, or pay £100; and if they returned, to suffer death. This act having expired, another was passed in 1669, according to which a fine of 5s, was to be inflicted for the first offence, and 10s, or the second; and any one preaching, or suffering a religious meeting to be held in his house, incurred a penalty of £20. By 1 Will, & Mary, c. 18, Protestant dissenters were freed from these penalties; but it was not till 1812 that the Conventicle Act was repealed by 52 Geo. III. c. 112.

Convention kon-cent-shun (Lat.), denotes properly the act of coming together, a meeting or assembly of several individuals. It is more particularly applied to a formal meeting, or an assembly of delegates or representatives for the transaction of important business, civil or ecclesiastical. In English Hist, it is the name given to an extraordinary assembly of parliament, or of the states of the realm, held without the king's writ. Of this kind was the parliament which restored Charles II., and that which conferred the crown upon William, prince of Orange. In the latter case, William, on the abdication of James II., invited the lords spiritual and temporal, to the number of shout ninety, all who had sat in parliament under Charles II., and the mayor, aldermen, and fifty common councilmen of the city of London, to meet and deliberate upon the state of the country. They recommended him to summon a convention of the states of the realm; and accordingly circular letters were dispatched to the several counties, cities, boroughs, and universities, for the election of members. The convention met on the 22nd June,

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# Convention of Royal Burghs

1639, and, after long debate, passed the Act of Settlement, which declared the throne vacant, and conferred the crown, with its prerogatives more exactly limited and defined than formerly, on William and his princess jointly. A similar convention met at Edinburgh in March, 1689, and, after declaring that James had forfeited all title to the throne, made a tender of their Regione to the prince and princess of Orange.—In French Hist, the term is applied to that assembly which met after the Legislative Assembly had promoned the suspension of the royal functions in September 1988. nounced the suspension of the royal functions in September, 1792, and proclaimed the republic. This body dissolved itself on the establishment of the Directory, in October, 1796.—In the United States, meetings of the people of separate states by specially chosen representatives, to rovise and amend the state constitutions have been named conventions. tions, have been named conventions.

CONVENTION OF ROYAL BURGUS. ROYAL.)

CONVERSATION, kon-ver-sai'-shun (Lat. conversatio from on, and oerfor, I turn), denotes familiar discourse or easy talk between two or more persons, and is opposed to a formal conference. The pleasure and advantages to be derived from conversation are very manifest. There is much in it to lead the superficial observer to view it as a natural gift; and we find indi-viduals, and even nations, that have peculiar talents for it; but still it is an art, and may be learned like every other art, and from its value and importance it is entitled to much more attention than is usually bestowed upon it, at least in this country. Let a man have read, thought, studied as much as he may, rarely will be reach his possible advantage as a ready man, unless he has exercised his powers much in conversu-tion. De Quincey goes farther, and not only regards conversation as giving greater facilities to a person in expounding or diffusing the truth, but as giving a new insight into the truth itself. "A feeling dawned on me," he says, after narrating his carly dislike of conversation, "of a secret magic lurking in the peculiar life, velocities, and contagious ardour of conversation quite separate from any which belonged to books; arming a man with new forces, and not merely with a new dexterity in wielding the old ones. I felt, and in this I could not be mistaken, as too certainly it was a fact of my own experience, that in the electric kindling of life between two minds, and far less from the kindling natural to conflict (though that also is something), than from the kindling through sympathy with the object discussed in its momentary coruscation of shifting phases, there sometimes arise glimpses and sby revelations of affinity, suggestion, relation, analogy, that could not have been approached through any avenues of methodical study." But in relation to the majority of men, conversation is far less valuable as an organ of intellectual culture than of social enjoyment. For one man interested in conversation as a means of advancing his studies, there are fifty men whose interest in conversation points exclusively to convivial pleasure. This, as being a more extensive function of conversation, is so far the more dignified function; whilst, on the other hand, such a purpose as direct mental improvement seems, by its superior gravity, to challenge the higher rank."—(Essay on Conversion) Conversation.) The ancient philosophers were masters of the art of conversation, and adopted this mode of communicating instruction to their disciples. In modern times the French are distinguished, among all anomer lines the French are distinguished, among all other nations, for sparkling, fluent, suimated, and delightful conversation. The Encyclopédie Moderne says, not without some truth,—"Les Allemands ne causent pas, ils argumentent; la conversation des Italiens est une pantomime mélée d'exclamations; chez les Anglais, ce qu'on nomme conversation est un silence syncopé par des monosyllabes et interrompu de quart d'heure en quart d'heure par le bruit de l'eau qui s'échappe de l'urne à thé; chez les Français la conversation est un art qui a ses principes, ses règles, ses préceptes, et sa methode." Housseau justly remarks that the tone of good conversation is neither dull nor frivolous. It is iluent and natural; sensible, without being pedantic; cheerful, without being boisterous; elegant, without being affected; polite, without being insipid; and jocose, without being equivocal. It deals not in dissertations or epigrams; conforms to the de-

### Convict

mands of good taste, without being bound by rule; unites wit and reason, satire and compliment, withous departing from the rules of a pure morality, and allows all to speak on subjects which they understand. Each all to speak on sunjects which they understand, expresses his opinion, and supports it in as few words as possible; and no one attacks that of another with warmth, or upholds his own with obstinacy. All impart information, and all are entertained. In this art, as in most others, it is more easy to indistant things are to be avoided than to main the control of the standard what things are to be avoided than to main the sunjects when the same to be avoided than to main the same than the same to be avoided than to main the same than the same that the same than the same tha cate what things are to be avoided than to point out precisely what ought to be done. The object of conversation is to afford entertainment or agreeable information; and one of its first rules is to allow everybody to contribute his share, while every one at the same time ought to exert himself for the gratification of the company. Egotism, or any display of self-conceit, is the very bane of conversation, and carefully to be avoided, as is also tediousness in narration. Adapt yourself to your company, and your conversation to your talents and information. Good sense and good feeling should guide in the selection of topics for conversation, and prevent the introduction of subjects that may not be agreeable to the company. The great art of conversation is to keep it constantly flowing, and to seize upon points which can turn it into new cleaneds. "La conversation n'est point une course vers un but, une attaque régulière sur un point, c'est une promenade au hasard dans un champ spacieux, où l'on s'approche, on s'évite, on se froisse quelquefois sans se heurter jamais."—(Encyclopédie Moderns.) It is much to be regretted that an art which occupies such an important place among the accomplishments of social life is yet so much neglected as it is among us. It is one of the most important means that can be employed in the intellectual training of children, and yet it is entirely neglected in the schools. This is one of the errors that exist in our present artificial system of education, when children are taught subjects for which they will have little or no use in after life, to the entire neglect of such as will daily concern them.

thre neglect of such as will daily concern them. Conversations LEXIKON. (See Encyclor EDIAS.) CONVERSION, kon-eer-shun (Lat. concersio), in Log., conversion from another, by is the forming of one proposition from another, by interchanging the subject and predicate, thus: the converse proposition of "Every A is B," is, "Every B is A." There are three kinds of conversion,—simple, limited, and by contra-position. In simple conversion, both quantity and quality are retained, as in the example just given. Universal regative and particular affirmative propositions may be simply converted. affirmative propositions may be simply converted. It requires, however, that the extremes be of equal extent, — that is, either both distributed or neither distributed; as, "Every equilateral triangle is equiangular;" "Some poor persons are liberal." In limited conversion the quantity of universal affirmatives and universal negatives is changed; as, "All oaks are trees," "Some trees are oaks;" "Nothing that is morally right can be politically wrong," "Nothing politically wrong can be morally right." Conversionable proposition is applicable to universal affirmatives by juxtaposition is applicable to universal affirmatives and particular negatives, and consists in the combining with each of the transposed extremes the pair no not; as, "Whosoever is of God doeth righteensness," Whosoever doeth not righteensness is not of God."

Conversion, in Law, is where a man has found, or becomes possessed of another's goods, and refuses to deliver them on demand; in which case he is said to have converted them to his own use. And an action of trover will lie to recover the goods, or the value thereof.

CONVERT, kon'-nert (Lat.), is one who changes his religion, and is specially applied to such as abandon any other faith and adopt that of Christianity. It is opposed to apostate, applied to one who has forsaken the Christian religion for some other.

CONVEX. (See CONCAVE.)

CONVEX. (See CONCAVE.)

CONVEYANCE, kon-vait-ins (Lat. con, and veho, I carry), in Law, is a writing, sealed and delivered, whereby the property in lands and tenements is constituted by the property in lands and tenements is constituted by the control of the property in lands and tenements is constituted by the control of the property in lands and tenements is constituted by the control of the property in lands and tenements is constituted by the control of the contr veyed from one person to another. Where the property in goods or in a term of years, or other estate less than freehold, is passed by deed, the instrument of transfer is called an assignment. (See Assign-

CONVICT, kon'-vikt (Lat.) denotes generally one

# Conviction

convicted of a criminal charge, particularly of a cerious nature. In a special sense, it is applied to such as have been sentenced to transportation or penal servitude. (See PRIVAL STRUIDS, PRIVADO STRUIDS, CONVICTION, Reservit Shum (Lat.), is a record of the

summary proceedings upon any penal statute before one or more justices of the peace, or other persons duly authorized in a case where the offender has been

convicted and sentenced.

CONVOCATION, kon-vo-kai'-shun (Lat. con, and roco Really, an assembly of the clergy of the Church of England, by their representatives, for the purpose of consulting on ecclesiastical matters. They were originally ecclesiastical councils of the archbishops, summoned for the consideration of spiritual matters; but manuel for the consideration of spiritual matters; but they afterwards came to be endowed with certain par-liamentary privileges. Convocations were first as-sembled in England, under the king's authority, by Edward I., who summoned them by writ, directed to the two archbishops, for the purpose of obtaining subsidies from the clerical body. Subsequently, con-vious tions continued to be held without royal authority that the passing of 25 Henry VIII., which declares that meither archbishop can summon a convocation withneither archbishop can summon a convocation without the king's command, nor continue it after it is com-manded to cease. When assembled, they cannot confor to constitute any canons without license from the king, nor can they execute any of their canons without royal assent. They cannot execute any after royal assent, but within the four following limitations:—(1) That they be not against the prerogative of the king; (2) nor against the common law; (3) nor against any statute law; (4) nor against any custom of the realm. In 1661, convocation granted a subsidy to Charles II., which was the last tax of the kind paid by the English clergy; for by an arrangement made between Archbishop Sheldon and Lord Chancellor Clarendon in 1664, the convocation of the clergy gave up the privilege of taxing themselves to the House of Commons, in consideration of their being allowed to vote at the election of members of that house. Since that time, convocation exists in little more than name and form. On the meeting of every new parliament, the arch-bishops of Canterbury and York, in obedience to a writ issued from the crown, convoke the bishops, and the bishops the clergy of their respective dioceses. After the transaction of a few formal matters, the meeting is generally prorogned. Convocation, like parliament, consists of two distinct houses,—the one realight the upper house, where the archibishop and bishops sit, and the other the lower house, where the rest of the clergy are represented by their deputies. In the convocation of York, however, on the rare occasions on which it meets, the business is generally conducted in one assembly. Some attempts have recently been made to rescue convocation from its present lifeless state, but hitherto with very little effect.

CONVOLVULACEE, kon-nol-nu-lai-see (from Lat. convolvo, I roll or bind together), in Bot., the Convolvolus or Bindweed fam., a nut. ord. of dicotyledumous plants in the sub-class Carolliflora. Harts or shrubs generally twining or trailing, and milky. leaves are alternate and exstipulate. The calyx has the deep divisions; is much imbricated, persistent.
The corolla is 5-partite or 5-plaited, regular, deciduous, and has no scales in its tube; estivation plaited. There are five stamons alternate with the lobes of the corolla. The overy is 2-, 3-, or 4-celled, or its carpels are more or less distinct. The fruit is capsular. In this order there are 47 known genera, with about 665 species, which are chiefly found in the plains and valleys of hot and tropiesi regions. A few flourish in temperate climates, but none in the coldest latitudes. They are remark-able for the presence of an acrid milky purgative juice in their roots. Jalap and scammony are products of this order.

CONVOLVULUS, kon-vol'-ou-lus, in Bot., the Bindweed, Ochronitions, kon-vol-val-lus, in Bot., the Bindweed, agen, of plants, the type of the nat. ord. Convoluntacea. It is characterized by a bell-shaped corolla, with five prominent plants and five shallow lobes. Three species are natives of Britain; namely C. arvensis, Sepium, and Soldansila. C. Scammonia, a native of Asia Minor, is a rainable medicinal plant, being the source of the purgative gum-resin called scammony. This is obtained from the fresh root, by cutting, the top obliquely of,

# Coolies

and allowing the milky juice which exudes to be est lected in shells or other vessels. The greater part of the scammony of English commerce is imported from

Smyrna. It is usually much adulterated.

Convoy, kon'-voi (Fr. convoi), in Mil, a train of waggons laden with provisions, accompanied by a detechment of troops to guard them from falling into the hands of the enemy .- In Mar., the name is given to some of her Majesty's ships that sail with a fle merchant-vessels in time of war, to protect them from the enemy's cruisers in their transit from one post to another. If any of the ships thus protected get can-tured, through neglect on the part of the master to obey signals, or from parting company with the comvoy, the policy of insurance effected on the vessel and cargo before starting becomes void.

CONVULSIONARIES, kon-vull-shun-d-res, the name given to a fanatical sect of Jansenists, who made their appearance in Paris about 1730. They used to accemble at the grave of a celebrated Jansenist named Francis of Paris, in the churchyard of St. Medardus, and there work themselves up into the greatest agitations or convulsions, preaching, prophesying, and prefessing to receive wonderful revelations. They threw themselves into the most violent contortions of body, rolled about on the ground, imitated birds and beasts, and when they had completely exhausted themselves, went off in a swoon. In 1732 the king caused the churchyard to be walled in and a watch set over it. and, the following year, he issued orders for them to be imprisoned; but even these steps did not entirely put a stop to their fanaticism.

CONVULSIONS, kon-vull-shans (Lat. conveile, I pull together), in Path., is a violent and involuntary contraction of the muscles of the human body, generally with corresponding relaxations, but sometimes with rigidity and tension. The fits vary much in extent and violence, sometimes attacking the whole body, at other times only particular parts; sometimes lasting only for a few minutes, at other times continuing for hours. the affected muscles are rigid and tense, and their contraction persistent or not quickly alternating with relaxation, the convulsion or spasm is said to be tonic; when contractions and relaxations rapidly alternate, it is called clonic; when slight contractions rapidly alternate with relaxations, it is called tremor. Sometimes the attack is sudden and without any warning; but generally it is preceded by certain premonitory signs, such as giddiness, dimness of vision, coldness of the extremities, tremblings, and a cold air creeping up the back or up a limb. During the fit the teeth guash and often pite the tongue, the mouth foams, the eyes roll wildly about, and the whole face is distorted. The muscular force exerted is sometimes so great as to overcome the strength of several attendants. Great languor commonly succeeds, attended frequently with headache and giddiness; but these generally pass quickly away. In partial convulsions the mind is quickly away. In partial convulsions the mine rarely affected; but when general, it is in nost cases lost during the fit. The causes of convulsions are many and varied, and their treatment must in each case depend very much upon the cause. In children the common cause is irritation of the bowels, arising from gross and indigestible foods, teething, or worms. These are to be treated by the administration of appropriate purgatives and the lancing of the gums. In puerperal convulsions bleeding and opiates are the usual remedies; and in cases where they arise from violent affections of the mind, the exciting causes must be studiously avoided. During the fit the patient should be immediately surrounded as much as possible by fresh cool air, his face, neck, and bosom freely exposed to it, and everything tight about the body loosened. For children a warm bath is strongly recommended. The after-treatment consists in the judicious use of tonics and nervous stimulants, with cold bathing, regular exercise in the open air, plain but nourishing diet, and attention to the state of the

COOLERS, or COULES, koo'-less, was originally the name of one of the most fierce and barbarous of the aboriginal tribes of Hindostan, which abounds chiefly in the province of Gujerat. From the circumstance of many of these being afterwards employed as labourers and porters in Bombay and other parts of India, the

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# Cooperage

name came to be applied by Europeans to that class of persons generally in India. It is now also applied of persons generally in India. to emigrant labourers from India and China to America.

the West Indies, and other parts.

Ocorreign, or Coorreing, koop'-er-ig, koop'-er-ing [Ang.-Sax.], the mechanical art by which casks, tube, barrels, and all kinds of wooden vessels bound together with hoops, are made. It is a very ancient art, and its invention is ascribed by Pliny to the people who lived at the foot of the Alps. On account of the abundance of wood, the fabrication of casks was early introduced into France, and from that country it was imported into Britain. The occupation of the modern cooper is divided into several distinct branches. dry cooper makes casks for containing all kinds of goods not in a liquid state; such as sugar, flour, &c. The west or tight cooper makes vessels for holding liquids; and this branch is subdivided into large and small work, which are kept quite distinct. There are, also, white coopers, or those who make tubs, pails, churns, &c.; and there are coopers in general, who undertake every variety of work. The unright pieces which form the sides of a barrel or cask are called staves, and the shaping and planing of these is the most difficult and the most important part of a cooper's work. Each stave must form part of a double con-coid; it must be broader in the middle, and gradually become narrower, but not in straight lines, towards the two extremities. The outside of the staves, across the wood, is wrought into segments of a circle, and is made thickest in the middle, growing gradually thinner towards the ends. When the staves are dressed and towards the ends. When the states are dressed and arranged in a circular form, the cooper can make their odges cuincide perfectly together. In the shape of the staves, and in giving the proper curve, consists the principal part of the cooper sart. The best work is made of eak, of which five kinds are used; viz., Quebec, Virginia, Dantzie, Hambro, and Euglish. Small dry casks or kegs are chiefly made of Quebec onk. All wood employed ought to be thoroughly dried before being put together.

OPERATION, ko-op'-er-ai'-shun (Lat. con, and opus, a work), denotes literally a working together, and in Pol. Ec. is applied to certain societies formed among the industrial classes for some commercial purpose.
The prevailing belief that the labourer does not work for himself, but for the capitalist,-that the latter obtains all the profit of his labour, -has led to the natural conclusion, that if he could work for himself, if he could supply capital as well as labour, then the whole of the profits would be his own. This has led to the formation of societies among the working classes, where, by each contributing a small sum to the general fund, they have obtained capital for the purpose of embarking in some commercial undertaking, the profits on which being afterwards divided among them, or going to increase their capital and enlarge the sphere of their operations. Thus, instead of putting their savings into a bank, or investing it in other securities which yield only a small interest, as the capital is om ployed by others, who must have their profits out of it, they employ it for themselves, and thus obtain the whole of the profits. Co-operation differs from comaunism, socialism, or any other fanciful scheme of civil society. It is simply a joint-stock company, car-cying on some commercial enterprise. It usually rying on some commercial enterprise. It usually takes the form of a society for supplying its members and others with articles of daily consumption. The goods are purchased with the money of the society, and sold at the ordinary market rate, the profits being periodically divided among the members, or going to increase the capital. At Rochdale, Leeds, and other places, co-operative societies of working men have been set on foot, and carry on large flour-mills, cottonfactories, and other industrial establishments. Each factories, and other industrial establishments. Lacon operative member receives weekly wages, and periodically a share of the profits. "The form of association," says J. S. Mill, "which, if markind continue to improve, must be expected in the end to predominate, is not that which can exist between a capitalist as chief, and workpeople without a voice in the manage-ment, but the association of the labourers themselves on terms of equality, collectively owning the capital with which they carry on their operations, and working ander managers elected and removable by themselves.

# Copernican System

"There is a capacity of exertion and self-denial is to masses of mankind which is never known but on a rare occasions on which it is appealed to in the mas of some great idea or elevated sentiment." The ay or some great mes or envised semiment. The attem of co-operation is one of great benefit to it working classes, if properly carried out. It fosts provident habits, and encourages industry. Has individual is as much as ever dependent upon his executions, which are also more suitably rewarded. leads, also, to strict inquiry into the moral character of such as are desirous of admission into their society, By several recent statutes, all the provisions relating to friendly societies have been extended to such asso-ciations of working men "as have been formed for the mutual relief, maintenance, education, and endowment of the members, their husbands, wives, children, or kindred; and for procuring them food, lodging, clothing, and other necessaries, by exercising or carrying on in common their respective trades or handicratts. (See FRIENDLY SOCIETIES, SOCIETIES.)

Coor, koot .- The habits of this bird closely resemble those of the common Galling. They are found in various parts of Europe, Asia, and America, but abound in larger numbers in Holland than elsewhere. It is about sixteen inches in length; its upper parts are slaty black, and its under lead-colour. From the bill almost to the crown of the head there is a fleshy excrescence, destitute of feathers, and smooth and round. On this account it is sometimes called the bald-headed

COPAIBA. (See COPAIFERA.)

COPAIREA. (c. pai: fe-rā (from copaibs, the Brazilian name, and Lat. fero, I bear), in Bot., a gen. of plants belonging to the nat. ord. Leguminoses, sub-ord. Geneal-pinies. The species are natives of tropical America, and several yield the valuable oleo-resiu which is used in medicine under the name of balsum of copaids.
This is obtained by making incisions into the stems of the trees. Most of the copsiba of commerce is brought from the Brazils, a very little being imported from Guians and the West-Indian islands. The timber known as the purple-heart, or purple-wood of Guiana, is the produce of C. pubifora, and probably C. brac-teata also. It is largely employed for making musket ramrods and for ornamental purposes.

COPAL. (See HYMENÆA.) COPALCHE BARK. (See CROTON.)

COPARCHNARY, ko-par-se-na-re (Norm.), is an estate where lands of inheritance descend from the ancestor to two or more persons. It arises either by common law or by particular custom. By common law, as where a person seized in fee simple or in fee tail dies, and his next heirs are two or more females, his daughters, sisters, sunts, cousins, or their representatives. In this case they shall all inherit; and these co-heirs are then called coparceners, or, for brevity, parecess. Parceners by particular custom are where lands descend, as in gavelkind, to all the males in equal degree, as sons, brothers, uncles, &c.

COFE, koap (Sax. coppe), is a kind of cloak or vest-ment worn by the clergy of the Anglican church during divine service. It reaches from the neck nearly to the feet, and is open in front, except at the top, where it is united by a band or clasp. The rubries of Ed-ward VI. prescribe a cope or vestment for the priest administering the holy communion, and for the bishops when executing any public ministration in the church, for which a vestment may be substituted either by priest or bishop.

COPE, among Miners, is a custom of tribute due to the Crown, or lord of the soil, out of the lead-mines of Derbyshire.

Cornc, ko-pek', a Russian copper coin, equal to the hundredth part of a rouble, which is about 3s. 2d. aterling.

COPERNICAN SYSTEM, in Ast., is the term applied to that system of astronomy propounded by the cele-brated Polish astronomer Nicholas Copernicus, who was the first to affirm that the sun and stars are stationary; that the moon alone revolves about the earth; that the earth is a planet, whose orbit is between Venus and Mars; that the planets revolve about the sun; and that the apparent revolution of the leavens is caused by the rotation of the earth on its axis. (See Astro-NOMY, PTOLEMAIC STATEM.)

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COPRENIUM, ko-per-nisk 'gd, in Box, a gen. of palme. The species C. oerifera, the Carnauba palm, is a native of the Brazile. On the lower surface of its leaves wax is secreted, and this is occasionally imported into this country under the name of Carnauba or Brazilian

Correg, ko'-ping (Du. kop, the head; Sax. cappe, a cap), in Arch., the layer of stones or brick that is placed on the top of a wall to form a finish to it, and placed on the top of a wall to form a finish to it, and to protect it from the weather. There are three kinds of coping; flat or parallel coping, which is generally placed on gable-ends of houses and walls of all kinds; feather coping, the stones of which are thicker on one side than on the other; and saddle-back coping, which slopes from the centre on either side. The coping should project beyond the surface of the wall over which it is placed, to prevent the rain from trickling down its sides.

COFFER, kop'-per, in Chem., symbol Cu, equivalent 31.75, spec. grav. 8.921 to 8.952. The symbol of this important metallic element is an abbreviation of its important metalic element is an abbreviation of its Latin name cuprum, which word is itself derived from that of the island of Cyprus (Gr. kupros), where it was first worked on an extensive scale. It was called Venus by the alchemists, who gave to it the symbol of that planet, 2. Copper is a hard, sonorous, ductile, and malleable metal, of a characteristic reddish-brown colour. Very thin films have been obtained, which were a fe a beautiful green colour by transmitted light. colour. Very thin films have been obtained, which were of a beautiful green colour by transmitted light. although of the natural colour by reflected light. is one of the best conductors of heat and electricity, and expands one part in 682 between the freezing and boiling points of water. By slow voltaic reduction, it may be obtained in cubes and octahedral forms, which are also taken by several deposits of native copper. The melting-point of copper is 1996° Fahr; and by exposing it to a very intense heat, it boils and volatilizes, burning with a brilliant green flame. Heated to redness in the open air, copper combines rapidly with oxygen; but even moist air at ordinary temperatures has but little effect on it. In sea-water it becomes gradually corroded by the formation of an exychloride of copper. Nitric acid oxidizes and dissoives it with great rapidity; sulphuric does not act on it at ordinary temperatures, but dissolves it rapidly if heated, sulphurous acid being evolved and oxide of copper formed, which unites with the excess of soid to form the sulphate. Hydrochloric acid dis-solves it with access of air; if the air is excluded, no action takes place. It is but little affected by the fixed alkalies; but, with access of air, ammonia slowly oxi-dizes it. The uses of copper are very important, large quantities being used for sheathing ships, and in the manufacture of boilers and utensils for domestic pur-With zinc it forms brass, and with different poses. With zinc it forms brass, and with different proportions of tin it forms bronze, bell-metal, gunmetal, and speculum-metal. Its oxides and salts are largely used as pigments and in pharmaceutical preparations. Copper unites with oxygen in four proportions:—1. The sub-oxide or dinoxide, Cu<sub>2</sub>O; 2, the protoxide or bluck oxide, Cu<sub>2</sub>O; 3, the binoxide, Cu<sub>2</sub>O; 2, the protoxide or bluck oxide, Cu<sub>2</sub>O; 3, the binoxide, Cu<sub>2</sub>O; and 4. eupric acid, the composition of which is not known. Bub-oxide of copper may be obtained in several ways:—1. By calcining the sub-chloride with carbonate of sods, and washing the residue; 2. by beating four parts of copper-filings and five parts of protoxide of copper in a close crucible; 3. by boiling adding potassa. By the first and third processes, the suboxide is obtained in a crystalline state. Subsuboxide is obtained in a crystalline state. Subsuboxide exide of copper is a feeble base, and its salts are un-important. Its principal use is in the manufacture important. Its principal use is in the manufacture of stained glass, to which it imparts a ruby-colour of great beauty. Protoxide of copper, CuO, is prepared by heating copper plates and turnings in a current of air, or by calcium nitrate of copper in an earthen crucible. It is a black powder, possessed of attong hygroscopic qualities. When strongly heated, it thuses, and parts with a portion of its oxygen, a compound of suboxide and protoxide being formed. Oxide of copper is easily reduced at a moderately high temperature by carloon, hydrogen, or organic matter.—a of great beauty. Pertocide of copper, CuO, is prepared by heating copper plates and turnings in a surrent of air, or by calcining nitrate of copper in an arthen crucible. It is a black powder, possessed of attenuers in the surrent of air, or by calcining nitrate of copper in an arthen crucible. It is a black powder, possessed of attenuers in the surrent of air, or by calcining nitrate of copper in an arthen crucible. When strongly heated, it flues, and parts with a portion of its oxygen, a consolide and protoxide being formed. Oxide pound of suboxide and protoxide being formed. Oxide of copper is easily reduced at a moderately high temperature by carbon, hydrogen, or organic matter,—a property which renders it peculiarly valuable in the ultimate analysis of organic bodies. It is also used to the surface of copper is occasionally found crystallized in tultimate analysis of organic bodies. It is also used to the surface of copper is occasionally found crystallized in tultimate analysis of organic bodies. It is also used to the surface of copper is occasionally found crystallized in tultimate analysis of organic bodies. It is also used to the surface of copper is occasionally found crystallized in tultimate analysis of organic bodies. It is also used to the surface of copper is occasionally found crystallized in tultimate analysis of organic bodies. It is also used to

water, but dissolves freely in soids, yielding very important salts. The hydrated axide, CuO2HO, inabitained by decomposing a solution of a copper salt with an excess of potassa. The pigment known as blue varietier consists of a hydrated oxide of copper. Boiled with water, it becomes black and anhydrius. It is soluble in ammonia, forming a deep blue solution. Binoxide of copper, CuO, has been obtained by the action of binoxide of hydrogen, or hydrated oxide of copper, It is a yellowish brown powder, easily decomcopper. It is a yellowish-brown powder, essily decomposed into oxygen and oxide of copper by heat or acids, Cupric acid, the formula for which has not been detertermined, is known only in combination with potass and is formed when fluely-divided copper is heated to reduess with caustic potsah and nitrate of potasts. Digested in water, the mass yields a blue solution, supposed to consist of cuprate of potasts. The salts of copper are characterized by their green or blue colour. They are nearly all soluble, and have a strong, disagreeable, metallic taste, acting as poisons. on the human system. The symptoms of poisoning by copper are violent and irrepressible purgings and vomitings, followed by exhaustion and death. The best antidote is albumen, or white of egg, with which they form an insoluble and almost inert compound. In medicine, sulphate of copper is used as a tonic, and antispasmodic in cases of dyspepsia and Asiatic cholera. It is also used as an outward application to wounds which present the granulated appearance known as "proud flesh." In five-grain doses, sulphate of copper acts as a powerful enetic. The other salts of copper are but seldom used. The most other saits of copper are but seidom used. The most characteristic reactions of copper saits are as follows: Ammonia in excess gives a dark blue solution; yellow prussiate of potash gives a red-brown precipitate. A strip of bright metallic iron precipitates copper from acid solutions in a metallic form. Of late years, copper has been used somewhat extensively to give a bright green colour to pickles and preserves. Its presence may be readily detected by incinerating the suspected article, washing the ashes in water, and filtering. If, on the addition of liquid ammonia, the solution strikes a deep blue colour, copper is present. Oxide of copper forms four compounds with acetic acid: neutral acetate (known in commerce under the name of verditer, which see), subsesquiacetate, diacetate (or verdigris, which see), and the triacetate, which is the most stable of the acetates of copper. Copper forms two chlorides, two simple compounds with evanogen; Wurtz obtained a compound termed hydride of copper; and there is another important salt termed nitrate of copper. The copper of commerce is very nearly pure, containing only traces of arachie, iron, lead, tin, and silica. Copper is employed chiefly in the sheathing of ships, to protect them from the action of the sea-water. It is also used very largely in the construction of small boilers and culinary vessels. Copper-plates are used in engraving, the impression being very sharp and delicate. The most important alloys of copper and zine are brass, Dutch gold, pinchbeck, and tombac. Brass varies in composition according to the purpose for which it is to be used. It generally consists of twothirds copper and one of zinc, with traces of lead and tin. Formerly, it was the custom to fuse the zinc ore and the copper together; but nowadays it is considered better to prepare brass by combining its constituent metals in proper proportions. Tombac is about fifteen per cent. poorer in copper. The principal alloys of copper and tin are bronze, gun-metal, bell-metal, and speculum-metal. The alloy known as argentum, packfong, or German silver, consists of two parts of copper, one of nickel, and one of zinc. The copper and zinc are first fused together, and the zine

### Copper Pyrites

Lake Superior is a vein of metallic copper associated with silver, two feet in thickness. The commencet ore of copper is copper pyrites, which is the ore found in Cornwell, from which more than two-thirds of the copper used in Great Britain is obtained. After being sorted and sifted, it is sent to Swanses to be smelted. North America and Saxony also supply this ore. The Australian ore, large quantities of which are annually imported, is a mixture of the green and blue carbonate. and contains from 25 to 30 per cent. of metal, the average of Cornish pyrites containing only 84 per cent. Cartain ores found in Chili are galuable from the amount of silver they contain. The red and black oxide also occur in Cornwall, Siberia, Brazil, and Germany.

COPPER PTRITES, in Min., an important ore of copper, occurring as a double sulphide of iron and copper, occurring as a double sulphide of iron and copper, Cu<sub>2</sub>S.F.S., in various parts of the world. Copper pyrites have a brassp lustre, and are found generally in amorphous masses with a conchoidal fracture; sometimes they occur crystallized in tetrahedra. The variety called peacock copper ore contains a very large per-centage of copper.

COPPER-SMELTING. (See SMELTING.)

COPPERAS, kop-per-us (from Germ. kupper-wasser, copper-water).—This term is applied, with the prefixes blue and green, to the sulphates of copper and iron

respectively.

COPPRED, kop'-perd, in Mar., is a term employed to denote a ship whose bottom is cased with copper, in order to prevent the worms eating into the planks or To keep dirt from accumulating there. The practice of copper-sheathing was introduced about the year 1758. COPPER-EASTENED.—When the heads of all the bolts and other metal-work in the exterior of a ship's hull

are formed of copper, she is said to be copper-fastened. This is done because, if made of iron, they would corrode

when the vessel is copper-sheathed.

when the vessel is copper-sheathed.

COPPERFLATE PAINTING is performed at what is called a rolling press. In the process of printing, the plate of copper from which the impression has to be taken is raised to the temperature of about 180°, by placing it in an iron box in which steam circulates. Copper-plates were formerly heated by placing them copper-places were formerly heated by placing them over burning charcoal, thus causing the trade to be very injurious to the health of the workmen. After the plate is heated sufficiently, the printer dabs a small quantity of ink on the face of it with a rubber made of linen rags. He then removes the plate from the source of heat, takes off some of the superfluous ink with a piece of canvas, next carefully rubbing the face of the plate with both hands in succession. To accelerate the wining, he dips his hand from time to time in whiting. The chief art of the printer is to remove every particle of the ink from the plain surface, and yet not disturb the ink in the engraved parts. When properly finished, the plate is laid on the plank of the press, and the damped paper which is to receive the impression is laid over it, with two or three folds of flannel or blanket above. The plate is then pulled through the rollers of the press, and the required impression obtained.

COPRIDE, kop'.ri-de, a fam. of four-winged insects allied to the Scarabaæ. The name is from the Greek word for dung (kopros), in which these beetles are ge-

nerally found.

COPROLITES, kop'-rol-ites (Gr. kopros, dung; lithos, stone), are the excrements of animals found in a fossil state in the secondary and tertiary strata. They consist chiefly of the voidings of saurians and sauroid fishes. The true nature of coprolites was first discovered by their occurrence near the region of the intestinal tube in the bodies of several fossil ichthyoautestinal tibe in the bodies of several fossil ichthyo-sauri. Scales, bones, teeth, and other parts of undi-gested food, are often found in them, and occusionally they are found exhibiting the spiral twisting noticeable in the excrement of some living fishes. Coprolites contain a considerable proportion of phosphate of lime, for which reason they are largely employed in the manufacture of artificial manures.

facture of artificial manures.

COPTIC LANGUAGE, kop'-tik, is the language of the ancient Copts, or that which was in use in Egypt after the introduction of Christianity. What relationship it bore to the more ancient language of that country it was the country in the more ancient language of that country is is impossible to determine. The written character is

# Copuls

Greek, with an addition of eight other letters to express sounds peculiar to the Coptio, and many Greek words have been introduced with Christianity. There are two principal dialects of the Coptio,—the Sahidu, are Upper Egyptian, and the Memphetic, or Lower Egyptian. The former contains a greater number of Greek tian. The former contains a greater number of creek expressions, but the latter appears to be the more polished. There is a third dialect,—the Bashmuric, which was spoken in the Delta, but of which only a few fragments now exist. It is interesting from its supposed resemblance in some points to the language of the hieroglyphics. The Coptic literature is by no means rich or valuable, consisting for the most part of translations of the sacred Scriptures, lives of saints, homilies, and some Gnostic works. The translations of the Bible were probably made about the end of the 3rd or beginning of the 4th century, and follow, as far as the Old Testament is concerned, the Septuagint version. The Coptic language has not been spoken in Lower Egypt since the 10th century, but it lingered for some centuries later in some parts of Upper Egypt. It is still, however, employed by the Copts in the religious worship; but the lessons, after being read in Coptic, are explained in Arabic.

COPILS, kept-tis (from Gr. kepte, I cut), in Bot., a gen. of plants belonging to the nat. ord. Ranunculaceas. The species C. trifoliata, commonly called gold thread, is a native of North America, and is much prized for its root, which is a pure and powerful bitter, and forms an excellent stomachic and tonic. The root of C. Teeta is found in the bazaars of India, under the names of mishmee bitter and mahmira. It is intensely bitter, and

is a very valuable tonic.

Corrs, kopts, the name given to the Christian descendants of the ancient Egyptians. The name is generally believed to be derived from the city of Coptos, in Upper Egypt, to which, during the persecutions that took place under the Roman emperors, many of the Christians had fled for refuge. In Egypt they are called Kibl, which some are inclined to believe to be the root of the name Egypt. The number of Copts in the root of the name Egypt. The number of Copts in the country at present is not more than 150,000, or about a fourteenth part of the entire population, and about 10,000 of them live in Cairo. They are not of large stature, have black eyes, rather curly hair, and in several other respects resemble the ancient Egyptians, from whom they have inherited also the custom of circumcision. Their dress very much resembles that of the Moslems; but they are usually distinguished by a black turban. In character they are accurally gloomy descriptly, and avariance they are generally gloomy, deceifful, and avarious. They have always been distinguished for their expertness in figures, in consequence of which many of them fill important posts throughout the country, and have acquired great influence. In religion they are generally monophysites of the Jacobite sect, only a small portion of them being united either with the Greek or Roman church. They ascribe their conversion from heathen-ism to St. Mark, whom they regard as the first patri-arch of Alexandria. Their present patriarch is still said to be "of Alexandria," though he resides at Cairo. Besides him, they have a metropolitan of the Abys-Heades him, they have a metropolitan of the Abysainians, bishops, arch-priests, priests, deacons, and monks. The patriarch is always chosen from the monks of the convent of St. Anthony, either by his predecessor or by lot, and is not permitted to marry. He nominates the metropolitan of Abyssinis, who resides in that country. There are twelve bishops. resides in that country. There are twelve bisho The Copts are very strict in their religious observant and hate other Christian sects more than they do the Moslems. They practise baptism by immersion, unc-tion, and exercism; have auricular confession, and celebrate the Lord's Supper with leavened bread which has been dipped in wine. They fast regularly on Friday, and observe it with great strictness. Their monks and nuns lead a very strict life. The Copts have many schools, but only for boys, who there learn the psalms, gospels, and the apostolic epistles in Arabic, and then the gospels and epistles also in Coptic. The Coptic, however, is not taught grammatically, nor is it any longer a spoken tongue. - Ref. Conversations Lexikon.

COPULA, kep'-u-la (Lat., a band), is the name given in Log. to the word or words which connect the predicate and the subject of a proposition, which indicate

# Copyhold

that the predicate is affirmed or denied of the subject es the copula is contained in the predica as, The fire burns; but in strict logic is and is not, or some other part of the verb to be, are the only copulas permitted; as, The fire is burning; John is not at home.

COPYHOLD, kep'-s-hold, is a tenure for which the tenant has nothing to show but the copy of the rolls, made by the steward of the lord's court, on such tenant being admitted to any lands or tenements within a manor that time out of mind, by use and custom of the manor, have been granted or demised to such as are entitled to take the same in fee or fee-tail, for life, years, or will, according to the custom of the manor by copy of court roll of the manor.

COPYING-MACHINE, kop'-e-ing, a contrivance by produced without having recourse to transcription. A copying-machine generally consists of a flat bed, upon which rest the letter to be copied and the paper for the duplicate. Above these is a fixt plate, called a platten, which, by means of a screw or lever, is made to produce the necessary pressure. The ink with which the letter is written contains a certain amount of sugar or treacle, which is transferred to the paper laid upon it by the pressure exerted. The copy made is, of course, reversed, but the paper is purposely made thin, in order that the writing may be read through it. that the writing may be read through it. taken trivances have been invented for procuring the necessary of pressure, but the simple serew and Various consary amount of pressure, but the simple screw and lever appears to be the best of them all. The manifold-writer may be described under this head. It simply consists of a number of sheets of paper blackened with some composition that will come off when pressed hard, but will not move at a slight degree of pressure or friction. Blank sheets of paper are inserted between these, and the writing is performed with a hard stylet made of steel or agate, the whole being placed on a smooth copper or pewter plate. (See also Panta-GRAPH.)

COPYRIGHT, kop'-e-rite, is that right which the law allows an author or his assigns of printing and reprint-ing his own original work. The Roman law contains no recognition of the right of property as regards the productions of literature; neither with us in England was the right of authors in this respect clearly ascerwas the right of authors in this respect clearly ascer-tained until a comparatively late period of our legal history; but in the reign of Queen Anne it became at length the subject of positive regulation, and subse-quent enactments were applied to it. It is now mainly regulated by the 5 & 6 Vict. c. 45, which provides that the copyright of every book (under which word is included, in the construction of the act, every volume, part, or division of a volume, pamphlet, sheet of letter-press, sheet of music, map, chart, or plan sepa-rately published which shall be published in the life-time of its author, shall endure for his natural life, and for seven years longer; or, if the seven years shall and for seven years longer; or, if the seven years shall expire before the end of forty-two years from the first expire before the end of forty-two years from the first publication, shall endure for such period of forty-two years; and that, when the work is posthumous, the copyright shall endure for forty-two years from the first publication, and shall belong to the proprietor of the author's manuscript. If the work he unlawfully printed within the British dominions, an action for damages must be brought within twelve calendar months; and, if unlawfully reprinted in any place out with a first hadminions and imported into the United of the British dominions and imported into the United Kingdom, it may be seized as forfeited by any officer of the customs or excise, and the offenders are liable to penalties. The title of the work must be registered at Stationers' Hall before an action can be brought for the infringement. The act empowers the judicial committee of the privy council to allow the proprietor of a deceased author's work to publish the work, subject to such conditions as they may think fit. Besides the a disceased author's work to publish the work, subject to such conditions as they may think fit. Besides the remedy by action, the courts of equity will (after the registration) interfere by injunction to restrain an arkingement of the right. An assignment of the copyright properly registered at Stationers' Hall is as effectual as it made by deed. Protection does not extend to the work if it be immoral, blasphemous, or saditions in its tendency, or if it be defamatory of private character, or if (with a view to defraud the public it is published as the work of one who is not in truth

### Corel Rest

the author. The sole liberty of printing and publish ing (except in unlicensed places) al lecte to the lecturer; and the author of dramatic pieces and musical performances has, as his own property; the sole liberty of bringing them out upon the stage. The law also recognizes a species of copyright in engrand and recognizes a spones of copying in engrange and classified also in designs for articles, whether of ornament or utility. And by the law regulating international copyright, the And by the law regulating intermetional conjuright, the copyright of works, as well in the language in which they are written, as of translations, is reserved to foreign authors, under certain regulations, one of them being the registration at Stationers' Hall; and this international protection extends not only to books and prints, but also to articles of sculpture and other works of art. (See 5 & 6 Vict. c. 45; 7;& 8 Vict. c. 12; 8 & 9 Vict. c. 93; 10 & 11 Vict. c. 95; 15 & 16. Vict. c. 12; 13 & 14 Vict. c. 104; and 21; 22 Vict. c. 70.) (See further, as to protection of inventions, Patent, Lutters.) By the Copyright (works of art) Act, 1862, protection is extended to artists. It is thereby enacted that the author (being a British subject, or resident within the dominions of the crown) of ject, or resident within the dominions of the crown) of every original painting, drawing, and photograph, which shall be, or shall have been made, either in the British dominions or elsewhere, and which shall not have been disposed of before the commencement of the act (29th July), and his assigns, shall have the exclusive right of copying, reproducing, and multiplying the same for the term of his natural life, and seven years after his death. If, on sale, he wishes to reserve the copyright, he must have an agreement in writing to that effect, or the right will belong to the purchaser.

The act is not to prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding there may be copyright in some representa-tion of such seene or object. The work must be entered at Stationers' Hall, the charge for which is to be one shilling; and certain enactments of the 6 Vict. are to apply to the entry. The penulty for each offence against the act is £10, and foreiture of the copy. The International Copyright Act of the 7 & 8 Vict. forms part of the act.

COQUILLA NUTS. (See ATTALIA.)
COBACLE, kor'-ä-kl (Celtic, curach), a light boat or
canoe, constructed with a framework of wood covered with skins. Coracles were used by the ancient Britons from the most remote times. Julius Cosar built some after the British model: the keel and gunbuilt some after the British model: the keel and gun-whales were of light wood, and the sides of wicker, covered with hides. The general size of a coracle was about four feet long and three wide, its shape being oval. It held only one person, who propelled it with a paddle, and on land it was carried with case upon the shoulders from place to place. The coracle is still in use in some parts of Ireland, especially on the coasts of Donegal and Clare. It is also used on the Severe, in England.

CORAL REEF, kor'-al (Gr. korallion, Fr. corail, Ger. riff, a reel), a term applied by naturalists, as well as by mariners, to any connected mass of coral structures, whether trending away in long partially submerged ledges, encircling islands like breakwater barriers, or rising as low ring-shaped islets above the waters of the ocean. In almost all tropical seas, incrusting patches or small banks of living coral are to be found along the shores, wherever they consist of hard rock and the water is quite clear. In the In-dian and Pacific oceans, however, far away from any land, huge masses of coral rock rise up from vast and unknown depths just to the level of low water. These masses are often unbroken for many miles in length and breadth, and groups of such masses, separated by small intervals, occur over spaces some-times of 400 or 500 miles long by 50 or 60 in width. One of the greatest formations of coral rock is along the north-east coast of Australia. (See BARRIKE REEF.) The reef masses consist of living corels only at their upper and outer surface; all the interior is composed of dead corals and shells, either whole or in fragments, and the calcareous portions of other marine animals. The interstices of the mass are filled by calcareous sand and mud derived from the waste and débris, the wear and tear of the corals and shells, and by count.

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### Corbel

less myriads of minute organisms, mostly calcareous also. The surface of a reef, when exposed at low water, is composed of solid-looking stone, which is often capable of being split up and lifted in alaba, bearing ao small resemblance to some of our oldest limestones. The slabs, when broken open, are frequently found to have a semi-crystalline structure internally, by which the forms and the organic structure of the orals and shells are more or less disguised and obliterated. The raised coral-reefs in the islands of Timor and Java are often internally as white and frishle as chalk. Darwin states that the principal reef-builders are the madrepores, astrans, portles, menadrines, and nullipores, at moderate depths, and the militares are all others and other delicate. the milispores, seriatopores, and other delicate forms, at depths from fifteen to twenty fathoms,—the great at depths from fitteen to twenty inthoms,—the great field of coral development thus lying between low water and twenty inthoms.—Ref. Darwin On the Structure and Distribution of Coral Reefs; Voyage of H.M.S. Fly; Dank's Report on the Geology of the United States Exploring Expedition.

CORBEL, kor'-bel (Ang.-Norm.), in Arch., the name given to blocks of stone projecting from the surface of a wall to support the machicolations of towers (see MACHICOLATION), or the ends of the beams of the floors in old castles. The beams which form what is floors in old castles. The beams which form what is called an open roof in churches and large halls are often supported on carved corbels. The stones which support the bartizans (see Bartizan) at the angles of towers, jutting out in layers one above another, are also called corbel-stones, and stones which project in this manner are spoken of as "corbelling out."

Conchonus, kor'-kor-us (from Gr. koreo, I purge, in allusion to the laxative qualities of C. olitorius), in Bot., a gen. of plants belonging to the nat. ord. Tiliacca. The most important species is C. vapudaris, the jute-plant, a native of India. The fibre called jute, or jute-hemp, is obtained from the bark. It is now imported in enormous quantities into this country, and is employed for making coarse bags, and as a foundation for inferior carpets. It is also frequently mixed with silk in the manufacture of cheap satin fabrics. It does not appear to be well adapted for norms. It does not appear to be wen anapted for cordage, because it will not bear exposure to wet. In India it is used chiefly for the purpose of making coarse canvas called quanty, which is the common material for bags employed in packing raw produce. The species C. olitorius, commonly called Jews mallow, is used in some parts of the world as a pot-berb. In Panama the leaves of C. mompowensis are employed as a substitute for Chinese tea.

CORDELIEUS, kor-de-leers', was the name given to the strictest branch of the Franciscan friars, on account of their wearing a knotted cord for a girdle. were originally called minor friars, and were established towards the end of the 14th century. There are said to have been at one time in France no fewer than 284 male and 123 female convents of Cordeliers. During the French revolution of 1789, a political society assumed this title from the circumstance of its meetings being held in an old Franciscan convent. It was opposed to the Jacobins, and was of great influence, numbering among its members Danton, Desmoulins, Marst, and others.

Marst, and others.

Condiace kor-de-ai'-se-s (in honour of Cordus, a German botanist), in Bot., the Cordia or Sebesten fam., a nat. ord. of tropical trees in the sub-class Corolliflers. The fruits of many species are edible; as those of Cordia mayar and latifolia, known in India as Sebastens or Sebasten plums; those of C. abyssinica, commonly called the Wanzey, a native of Abyssinica; and those of Varronia rotundifolia, which are used to fatten cattle and poultry. The order consists of elevan cases in which there are about 180 known species. genera, in which there are about 180 known species.

CORDIALS, OF LIQUEURS, kord sides (Fr. Sp. cordial, from Lat. cor, the heart), are made by flavouring rectified apirit with different essential oils, such as aniseed, earsway, clove, peppermint, &c., and adding a portion of syrup sufficient to neutralize the burning taste of

the spirit.

Cordences, kor'-di-seps, in Bot., a gen. of Fungi, including many species which are very destructive to living plants and animals. The disease called ergo, which occurs in the grains of rye and other grasses, is produced by O. purpures. (For Ergot of Rye, see 563

# Corinthians, Epistles to

SHOALE.) Caterpillars are frequently killed by other species growing in them. The remains of the exterpillar, with the developed fungus of the species C. inensis, is a highly esteemed drug in China, where it is much used as a tonic.

TO TRANSPER. (See CORIANDRUM.)
CORTANDRUM, kor-e-iin-drum (from Gr. koris, a.bug,
in allusion to the smell of the leaves), in Bot., a gen
of plants belonging to the nat. ord. Umbelijfera. The species C. activum, the coriander, has long been cultivated for its fruits, improperly called seeds, which are used in the East for flavouring dishes and curriepowder, and in Europe for the purposes of the distiller, confectioner, and pharmaceutist. They have a peculiar odour and warm aromatic taste, due to the presence of a yellowish-coloured volatile oil.

CORIARIACER, ko-re-ar-e-ai'-se-e (Lat. corium hide), in Bot., the Coriario fam., a nat. ord. of di-cotyledonous plants, in the sub-class Thalamiflore. There is but one genus, which includes eight known species, natives of the south of Europe, Chili, Peru, New Zealand, and Nepaul. The order appears to be most nearly related to Ochnaces, with which it agrees in having its carpels distinct, and placed on an enlarged disk or gynophore; but it is distinguished from that order by its opposite leaves, by sometimes having polygamous flowers, by the persistent fleshy petals, by the absence of any style, and by its long linear distinct stigmas. The plants are to be regarded with distinct stigmas. The plants are to be regarded with suspicion, as they have sometimes produced poisonous effects: the fruits of some, however, are edible. The leaves of Coriaria myrtifolia have been used on the continent to adulterate senna, though such leaves are known to be poisonous. They may be at once distinguished from senna-leaves by their two sides being equal and symmetrical at the base, while those of seuna are unequal. C. myrtifolia and ruscifolia have been employed to produce a black dye: the fruits of both

species are very poisonous.

CORINTHIAN ORDER. (See ARCHITECTURE.) CORINTHIANS, EPISTLES TO THE, kor-in'-the-ans, are two epistles of the apostle Paul addressed to the church at Corinth, and forming part of the canonical writings of the New Testament. In order clearly to comprehend the scope of these epistles, it is necessary to glance at the circumstances of the people to whom they were addressed. Christianity was first planted at Corinth by the apostle Paul himself during a residence there of about eighteen months, between A.D. 51 and 53. After Paul's departure from Corinth. Apollos. an eloquent man and mighty in the Scriptures, came and preached the gospel there with great success, water-ing what the apostle had planted. Other teachers of Christianity also came among them, and the Church came to be divided into different sects,—some declaring for Paul, others for Apollos, some for Cephas, and some for Christ. The converts, too, were partly Jews and partly Gentiles; the former contending strenuthe observance of Jewish ceremonies, the latter giving way to the idolatrous and lascivious practices of the heathens. When the apostle Paul received information of this state of matters, he wrote to them his First Epistle, the contents of which naturally divide themselves into two distinct parts,—the one being intended to remedy the disorders and abuses that had crept into the Claurch, the other being in reply to certain questions which the Church had sub-mitted to him for his decision; as, concerning matrimony, concerning the lawfulness of eating things sacrificed to idols, and touching the resurrection of the dead. This epistle produced very different effects in the Church. Many were led to amend their conduct, and to greater vigilance and seal against the errors into which they had fallen; while others were led to cast imputations upon the spostle, and to accuse him of levity, pride, arrogance, and of being personally contemptible. The great object of the Second Epistle was, therefore, to defend himself against these imputations. He enlarges on his spiritual office, enumerates his sufferings and disasters, recounts his labours, and details his successes. The great oratorical power of this epistle has always been much admired. The various emotions that agitated the mind of the apostle when writing it are expressed with great power. These, as well as his elegance of diction, powers of

#### Cork

persuasion, and force of argument, are all admirably discussed and illustrated by Professor Royaards in his discussed and illustrated by Professor Royaards in his "Disputatio inauguralis de altera Pauli ad Corinthios Epistols," IS18. The former of these epistles is gene-rally believed to have been written about A.D. 57, the latter about 58. The authenticity of either has scarcely even been questioned; but much discussion has arisen as to whether the apostle had addressed to the church at Corinth an earlier epistle than either of these, reterred to in 1 Cor. v. 9, in the words, "I have written fo you in an epistle." Those who are of opinion that there was no other epistle, maintain that the reference is to the one he was then writing .- Ref. Horne's In-

traduction to the Holy Scriptures.

CORK, kork (Lat. cortex, rind, shell; Germ. kork). In Manuf., cork is the outer bark of the evergreen oak, a tree growing in Portugal, Spain, Italy, and France. The largest quantity of cork is obtained from France. The largest quantity of cork is obtained from Spain and Portugal; the smallest but best portion coming from France. The principal use of cork is for the stoppers of bottles, its softness and elasticity rendering it psculiarly valuable for this purpose. Being esceedingly light, it is used for the floats of fishermen's nets. Cork-cuttings, till lately a waste product, have received important applications in the manufacture of mattersess and life-invaronces. In a manufacture of mattresses and life-preservers. In a state of coarse powder, it is used, in conjunction with india-rubber and gutta-percha, in the manufacture of kamptulicon, or elastic floor-cloth. (See Kamptulicon) con.) Cork, when treated with nitric acid, yields

CORM, when the see. See also QUERCUS).
CORM, korm (Gr. kormos. a stump), in Bot., a solid underground stem, which does not spread by sending out roots, but remains in a rounded form. It occurs in the tulip, crocus, and in many other monocotyledo-nous plants. It is distinguished from a root by producing annually small corms, or thickened branches.

It differs from a bulb in being solid. (See Bulb.)
CORMODITYES, korm'o-files, in Bot., plants having
stems, as distinguished from Thallophyles, or those
which simply form cellular expansions of various kinds, to which the term thallus is applied. Cormophytes are divided, according to the internal structure of their stems, into three great classes, called respectively Exogens or Dicotyledons, Endogens or Monocotyle-, and Acrogens or Acotyledons.

CORMORANT, kor-mor-ant (Fr. cormoran).—This bird is very widely diffused, and inhabits the New as well as the Old continent. Its length is from twenty-seven to twenty-nine inches. Under the throat there is a

whitish collar, reaching as far upward as the eyes. Top of the head, neck, breast, and lower parts greenish black; upper part ashy brown, bordered by a band of glossy greenish black; quill and tail-feathers black; bill blackish ash; feet black. This is the bird's



CORMOBANT.

winter plumage. In the spring the occiput and a part of the nape of the neck are adorned by a creat of long green feathers, and the collar round the neck changes to the purest white. "The young, when first hatebed," writes Mr. Selly, "are quite naked, and very ugly, the skin being of a purplish black. This, in six or seven days, becomes clothed with a thin black down; into the feathered plumage is not perfected in less than five or hit weeks. I have repeatedly found that, when the search of the search only half-fledged, they im-

#### Corn Laws

mediately plunge beneath the surface, and endeavour to escape by diving. This they will do to a great distance, using their imperfect wings and pursuing their submarine flight in the same manner, and almost with as much effect, as their parents." The small spising from the cormorant is said to be so offensive that the Greenlanders will not touch it. If buried in the ground for about twenty hours, however, the offensive odour abates, and they may be esten by persons of strong appetites. It is found on the Tern Islands, where its nest is entirely composed of sea-weed, which is frequently heaped up to the height of two feet. In this rough nest are deposited from three to five eggs, of a pale bluish white, with a rough surface. Cormorants were formerly trained in England to catch tish for the table. When so employed, their necks were encircled. by a leather thong, to prevent them from swallowing the catch. The Chinese cormorant (Phylacrocorax siensis), or Leutze, as the Chinese call it, is commonly bred and instructed in the art of fishing.

CORN, koarn (Ang. Sax.), a term generally applied to all seeds used in making bread, especially the seeds of the cerealia. The principal seeds of this kind in temperate climates are wheat, rye, oats, and barley; while those of warm climates are maize, rice, and millet. In a more restricted sense the word corn is applied to that particular grain of a country which is most largely used in making bread. In England corn refers to wheat, in Scotland to oats, and in America to maize.

COEN LAWS and COEN TRADE.—From the great importance of corn as an article of food, it is scarcely to be wondered at that it was so long subject.

scarcery to be wondered at that it was so long subject to government interference and restrictions in this country. From the period of the Conquest down to the year 1436, the efforts of the government were directed to prevent its exportation out of the country, while, at the same time, its importation was permitted. The object was to provide an abundant supply of this prime necessary of life at as low a rate an assistant that intractable science of reditted as possible; but in that intractable science of political economy, the means adopted to produce a certain result have often been found to have a contrary effect, Agriculture was neglected, because the farmers could not obtain a remunerative price for their produce. 1436, therefore, with a view to stimulate home production, an act was passed authorizing the exportation of wheat whenever the home price did not exceed 6s. 8d. (12s. 103d. of present money) per quarter, and of barley when the home price did not exceed 3s. In 1463, another act was passed prohibiting the importation of corn from abroad until the home price exceeded that at which exportation ceased. On account of the fluctuating policy of the times, however, these laws were in a great measure inoperative. Nominally, they continued in ferce till 1562, when the prices at which continued in ferre in 100, when the prices as more exportation night take place were extended to 10s. per quarter for wheat, 8s. for rye, and 6s. 8s. for pharley. Nine years inter (1571) an act was passed which declared that the lord presidents and councils and the justices of assize should, within their respec-tive jurisdictions, consult with the inhabitants as to the cheapness and dearth of any kinds of grain, and fix annually the average prices by which exportation should be governed within their several limits. Corn might thus be exported at all times to friendly countries when proclamation was not made to the contrary, subject to a poundage or customs duty of 1s. per quarter on all wheat exported; and if exported under special license, and not under the act, the duty was 2s. per quarter. In 1593, another act was passed permitting exportation on paying a duty of 2s. per quarter on wheat and 1s. 4d. on barley and malt, whenever the price did not exceed 20s. and 12s. respectively. In 1604 the price was again raised to 26s. 8d. per quarter of wheat; and in 1623, to 32s. for wheat and 16s. for barley and malt. Besides the various acts passed for regulating the foreign trade in corn of this country, there were various enactments interfering with it within the kingdom. Under the impression that the injurious effects of dearths, which were then of frequent occurrence, were much aggravated by dealers in corn buying it up sad withdrawing it from the market, and that, if corn were purchased by the consumers directly from the growers, it would be obtained cheaper, as the profits of the dealers would

thus be saved, various acts were passed against the buying of corn in one market with the view of sell-ing it again in another, called expressing (which see), declaring such an offence to be punishable by fine and declaring such an offence to be punishable by line and imprisonment. During the troublous times of the civil war, the minds of the people were too much agitated to pay much regard to the corn trade; but, on the restoration of Charles II. a new scale was introduced. Wheat was permitted to be exported when the price did not exceed 40s, per quarter, barley and malt 20s., oats 16s.; the export duties being on wheat 20s. per quarter, barley and malt 10s., and oats 6s. 8d. By the same act the import rates or duties were fixed as Callows. On wheat when the price did not exceed 44s. follows: on wheat, when the price did not exceed 44s. per quarter at the place of importation, 40s. a quarter; when it exceeded that rate, 0s. 8d. a quarter; barley and malt, when the price did not exceed 30s. at the place of importation, 26s. 8d.; and when it exceeded that rate, 5s. per quarter. Of course, these high duties seted as a virtual prohibition of the trade. Three years later, the corn trade again became a subject of legislation. By 15 Car. II. c. 7, it was declared that when the price of wheat does not exceed 45s, per quarter at the havens or places of shipment, barley and malt 28s., and oats 13s. 4d., then it shall be lawful for any person or persons to transport said corns or grains from such places to any parts beyond the seas, subject, however, to the same rate of duties as had been fixed by the previous act. It was further declared that when the prices of said corns and grains do not exceed the above-mentioned rates at the port or haven where any of them may be imported, they shall be subject to the following duties; viz., wheat 5s. 4d. per quarter, barley and malt 2s. 8d., and oats 1s. 4d. This act further declared, that when the price of corn or grain did not exceed the above rates, then it should be lawful for any person or persons to buy in open market, and to lay up and keep the same, and afterwards to sell it without incurring any penalty. In 1670 a duty of 16s. was imposed upon all wheat imported into this country when the price was at or under 53s. 4d. per quarter in this country, and 8s. when above that price and under 80s., at which last importation was free. In order to determine accurately the price of grain at the various ports wherein foreign corn might be imported, it was enacted in 1685 that justices of the peace in the several counties may, at quarter sessions, by the oatla of two persons duly qualified (i. e. possessed of estates of a certain value and not being corn-dealers), determine the prices of the several kinds of grain to be certified to the principal officer of the customs in the several to the principal officer of the customs in the several counties for his rule and regulation. The average price of wheat per quarter for the ten years from 1650 to 1670, 48s. 10d.; from 1660 to 1670, 48s. 10d.; from 1670 to 1680, 50s. 8d.; and from 1680 to 1685, 44s. 3d. The increasing power of the agricultural party in the state is evident from the various legislative enactments that were made to protect their interests. This was still further evident by the act passed shortly after the accession of the prince of Orange to the throne in 1688, by which a bounty of 5s. was granted for every quarter of wheat exported when the price was at or below 48s., and other kinds of grain in proportion. Subsequently, by 11 & 12 Will. III. c. 20, all previous duties on the exportation of corn were abolished, while the duties exportation of corn were abolished, while the duties and restrictions upon the importation of corn continued unabated. From 1697 to 1773, the total amount of bounties paid on exports out of the public revenue was 26,237,176. In the four years ending 1691, the price of wheat averaged 27s. 7d. the quarter, being lower than at any period during the century; but in the four years preceding 1699 it reached 56s. 6d. "In the twenty-three years from 1692 to 1715," says Mr. Tooke, in his "History of Prices," "there were eleven bad seasons during which the average price of wheat was in his "History of Prices," there were cloven bad seasons, during which the average price of wheat was 45s. 8d. the quarter; in the fifty years ending 1765 there were only five deficient harvests, and the average price for the whole half-century ranged at 34s. 11d.; and taking the ten years ending 1751, during which the and taking the ten years ending 17st, during which the crops were constantly above the average, the price of wheat was only 29s. 23d. the quarter." In considering the effects of the bounty, it is not to be forgotten that prices were gradually falling before it was granted, and it was with the avowed intention of checking this fall that it was obtained. There can be little doubt,

however, that, by atimulating cultivation to too great an extent, it had counteracted the intention for which it was framed; and it was not till sixty or seventy years after its introduction that, by the increase of the population, the consumption came to be in some measure proportioned to the enlarged produce of the agriculturists. After the year 1750, when the exports of all kinds of grain amounted to 1,067,778 quarters, the quantity exported rapidly decreased, and in 1760 it was only about 600,000 quarters. After the peace of Paris, in 1673, the march of improvement was much accelerated, and the price of wheat rose to an unusual height. In 1773 an act was passed declaring the bounty and exportation to cease until wheat should be 44s, and barley 22s. a quarter; and allowing foreign wheat to be imported on paying a nominal duty of 6d, whenever the home price reached 48s, a quarter. The object of these regulations was to maintain, as far as possible, a level rate of 48s., which was assumed to be a fair price both for grower and consumer. The landowners raised a loud clamour against this law; and at length, in 1791, they succeeded in obtaining an act raising the price at which importation was allowed at 6d. a quarter to 54s., a duty of 2s. 6d. being imposed when the price was between 50s. and 54s., and a prohibitory duty of 24s, 3d, when below 50s. In 1804 a prohibitory duty of 24s, 3d. per quarter was imposed on all wheat imported when per quarter was imposed on all wheat imported when the home price was at or below 63s.; between 63s. and 66s. a middle duty of 2s. 6d.; and above 66s. a nominal duty of 6d. The price at which bounty was paid on exportation was changed to 40s.; but grain might be exported without bounty so long as the price did not exceed 54s. In 1813 and 1814 committees of both houses of parliament were appointed to examine and report on the state of the corn trade; and in 1815, after much opposition, an act was passed allowing the free importation of corn from foreign countries, in order to be warehoused or re-exported, but forbidding the importation for consumption unless the prices were, for wheat 80s., for barley 40s., and for oats 26s. From the British colonies, however, grain might be imported for consumption when the prices were, for wheat 67s, barley 33s, and oats 22s. In this year also the bounty was abolished, though since 1792 the price at home had been so high that none could have been along and the state of the sta none could have been claimed. In 1816 and 1817 the harvests were deficient, and the prices were raised above these limits, so that a large quantity of corn was imported free of duty. The year 1822 yielded an abun-dant harvest, and the prices fell lower than they had been at any time since 1709. In 1823 the act of 1815 was so far modified as to allow of grain being imported for home consumption when the prices were, for 70s., barley 35s., oats 25s. per quarter, and from British colonies when at 53s., 30s., and 20s. respectively. In order to prevent any violent reaction from a large supply of grain being suddenly thrown upon the market, a duty of 17s. a quarter was to be laid upon all wheat imported during the first three months after the opening of the ports, and 12s, thereafter, and other kinds of grain in proportion. In 1825 the importation of wheat from the British colonies of North America was wheat from the British colonies of North America was permitted, without reference to the price at home, on payment of a duty of 5s. a quarter. The following year a long-continued drought caused great apprehen-sions as to the harvest, and to prevent the disastrous consequences that might ensue had importation been prevented until the season was too far advanced to admit of supplies being brought from the north of Europe, his inajesty was authorized to admit 500,000 quarters of foreign wheat for home consumption. The crops of oats, peas, &c. being ascertained to be deficient, an order in council was issued on the 1st of September, admitting certain descriptions of grain for home consumption at an almost nominal duty until forty days after the first meeting of parliament, on the ground that "if the importation for home consumption ground that "if the importation for home consumption of oats and oatmeal, and of rye, peas, and beans, be not immediately permitted, there is great cause to fear that much distress may ensue to all classes of his majesty's subjects." Nothing could show more clearly the errors of the then existing system than the necessity that the government was under of thus interfering to this the property of the strength of i intention of checking this from time to time, in order to prevent the disastrous.

There can be little doubt, results that it otherwise would have produced. In

1927 Mr. Canning introduced certain resolutions into the House of Commons on this subject, the leading principles of which were, that foreign corn might be imported free of duty at all times for warehousing; and also be always admissible for home consumption on payment of certain duties, according to a graduated scale. The bill founded on these resolutions not being carried, the following year Mr. Charles Grant (afterwards Lord Glenelg) introduced a series of resolutions founded on the same principles as those of Mr. Canning; and, after a good deal of discussion, they were nmg; and, atter a good deal of discussion, they were earried, and embodied in act 9 Geo. IV. c. 60. In terms of this act, grain could be imported for home consumption at all times on payment of duties, decreasing as the price of grain advanced, and increasing as the fill. When the price of wheat was 66s and under 38 It fell. When the price of wheat was down and thuch offer, the duty was to be 20s. 3d., an additional 1s. of duty being imposed for every 1s. of decrease in the price under 60s.; between 67s. and 68s. the duty was 18s. 3d., increasing up to 73s., at and above which there was a uniform duty of is. per quarter. For barley, cats, rye, &c., there were similarly graduated scales. The prices which regulated the duties of this act were ascertained from the sales made in 150 of the principal towns of England and Wales. The dealers were bound, under a penalty for each omission, to make weekly returns of all their sales, to the corn inspectors of the different towns, who reported them to the comptroller of corn returns in London. From these reports the average weekly price of each kind of grain was computed, and the aggregate average price for the previous six weeks; and a certified copy transmitted to the collectors of customs at the different ports, and also published weekly in the Gazette. The duty on importation was regulated by the aggregate average for six weeks. In 1829 and 1830, the crops being deficient, there was a large inportation of corn, the average price of wheat being about 65s. a quarier. The crops from 1831 to 1835 being more than usually abundant, importation had almost wholly ceased, and in the last of these years the amost wholly ceased, and it are less of these years he price of wheat was as low as 39s. 4d. a quarter. In 1837 and the five following years, the crops were defi-cient; and in January, 1839, wheat was as high as 81s. a quarter. The inability of the sliding scale to maintain anything like a uniformity in the price of corn being abundantly proved, Lord John Russell, in name of the government, proposed, in 1841, the substitution of a fixed duty of 8s. a quarter on wheat, 4s. 6d. on barley, and 3s. 4d. on oats; but the ministry going out of office soon after, the proposal fell to the ground. In 1842, Sir Robert Peel introduced and carried his measure, in which the sliding scale was still retained, but largely modified. Under 51s., the duty on wheat imported from foreign countries for home consumption was 20s. decreasing gradually as the price rose to from 86s. to 69s., when the duty was 6s., and again decreasing gradually to 1s. when the price was 73s. or up-wards. The duty on colonial wheat when the price was under 55s. was 5s., and when 58s. and upwards, 1s. One hundred and thirty-eight new towns were also one nunarea and unity-eight new towns were also added to the 150 which under the former act, made returns of prices. All efforts, however, to maintain the price of corn at an equable rate were in vain, and in 1845 the unsatisfactory state of the corn harvest. and the failure of the potato crop in Ireland created serious apprehensions of a famine over the country. The Anti-Corn-Law League was also actively carrying on its operations, and monster meetings were being beid in different parts of the country, and addresses presented to the queen, praying for an abolition of the corn duties. On the 19th January, 1848, parliament was opened by the queen in person, and immediately thereafter Sir Robert Peel, who had for so many years been an active supporter of the corn duties, announced that he had been led to change duties, amounced that he had been led to change his views on the subject and to adopt the principles of free teads. On the 27th of January he detailed to the house his great scheme of commercial and Basacial solicy. It was finally arranged that that subject should be taken up by the house on the 9th of February. The debate was continued, by repeased adjournments, into the third week, when it finally terminated on the 27th of February, by a division on the twelfth night, when 337 members voted in favour of the measure and 240 against it: maiority. of the measure and 240 against it; majority, 97.

The second reading of the Corn Law bill was carried by a majority of 83, and the third reading, on the 1845 of May, by a majority of 98,—327 being for, and 229 against the measure. The debates were carried on with much acrimony on both sides, and, in particular, the personal character and motives of Sir Robert Peal were frequently and violently attacked. On the 18th of May, the bill was brought into the House of Lorde by the duke of Wellington, and after a series of animated debates and strong opposition, the bill was length carried, and received the royal saction on the 26th of June. By this act, 9 & 10 Vict. c. 22, the total repeal of the corn laws was provided for at the end of three years, or on the 1st of February, 1849; the duties being, in the mean time, considerably modified. On and after 1st February, 1849, wheat and other corn was subjected to a fixed duty of 1s. a quarter, and flour and mend of all sorts to a fixed duty of 44d. a cwt. Under the art of 9 Geo. IV. c. 60 (from 1828 to 1842), the entire quantity of foreign wheat imported was 13,562,856 quarters and 4,305,150 cwt. of foreign wheat flour, besides 597,700 quarters of colonial wheat and 1,744,591 cwt. of colonial wheat flour, besides 597,700 quarters of others and 1,745,591 cwt. of wheat and 1,804,223 cwt. of wheat and 1,004,223 cwt. of wheat meal and flour; in 1851, 3,83,638 quarters of wheat and 3,800,352 cwt. of wheat, 5,080,220 cwt. of wheat meal and flour; and 7,125,667 quarters of other kinds of corn. The gross amount of customs duty received from corn imported into the United Kingdom in 1860 was almost £1,200,000. The principal countries from which our foreign combined are Russia, Denmark and the Duchies, Prussia, France, United States, Turkey, and Egypt.—Ref. Encylopedia if McCulloch's Commercial Dictionary.

Corn Ren's a rent paid for land, varying in amount according to the price of corn. The principle is that a certain portion of the produce of the land is to be paid to the landlord for rent, not in kind, but at its money value. The quantity is fixed, but the value fluotnates with the average price of grain, which is sometimes taken for one year and sometimes for several. In many parts of Scotland rents are still paid in this way, being determined by the flars-prices which are fixed annually in each county by the sheriff and a jury. (See Fires.)

COHNACES, kor-nai-se-e, in Bot., the Cornel or Dogwood fam., a nat. ord. of dicotyledonous plants of the sub-class Casyciflora. They are trees, shrubs, or rarely herbs, with simple, exstipulate, and (with but one exception) opposite leaves. The flowers are generally perfect, but occasionally unisexual, with a superior four-lobed calyx; a corolla of four petals, with valvate æstivation; four stamens, alternate with the petals; an inferior ovary, usually two-celled, having a single pendulous anatropous ovule in each cell, and furnished with a simple style and stigma. The fruit is drupaceous. The embryo is in the axis of flesby albumen. There are nine genera and forty species natives of the temperate parts of Europe, Asia, and America. They are chiefly remarkable for tonic, febrifugal, and

astringent properties. (See CORNUS.)
CORNABINTS, kor-nar'ists, in Eccl. Hist., were the followers of one Theodore Cornhert, who flourished in the latter half of the 16th century, and was secretary of the States of Holland. He was a man of great ability, but a religious enthusiast, and wrote against the sects. He maintained that no one had any warrant to be a religious reformer who could not work miracles, and that it was not necessary for salvation to be a member of any church.

CORN-CRARE, or LANDRAIL, korn'-kraik (Gallinula craz).—The corn-crake appears to be extensively spread over the whole continent of Europe, and in Holland it is specially abundant. It is migratory, arriving here about the beginning of May. It is about the size of a partridge. All the feathers of its upper park are blackish-brown in the fliddle, edged with ash-colour; breast olive-ash; throat, belly, and abdomen white. Its habits are extremely shy. It selects for its abode grassy meadows, osier-beds, and such places, where its

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#### Cornes

may remain completely hidden. Its food is worms, enails, and insects. The nest is composed of tender water-flags and grasses, and from eight to twelve eggs, of a yellowish white, dotted with rusty spots.

of a yellowish white, dotted with rusty spots.

CORNEA, kor-ne-ā (Lat. cornu, a horn), in Anat., is
the name given to one of the coats of the eye, from its
being of a horny consistence.

CORNEN, kor-net (Ital. cornetta, a small flag), the
designation of commissioned cavalry officers of the
lowest grade. Cornets in the cavalry rank with ensigns of infantry regiments and second lieutenants of
engineers, artillery, and marines. The cornet is so
called from currying the guidou, or small square regimental flag.

mental flag.

CORNET-A-PISTON, kor'-net-a-pis'-ton (Fr.), a new kind of wind instrument, extremely popular amongst mo-dern composers. It is in reality a post-horn with the addition of three pistons. According to Konig, the carliest idea of a piston suggested itself to a German named Herr Stolzel, who, in the year 1806, introduced one successfully into the French horn, whereby the number of its stopped tones was diminished. Shortly after, the use of a second piston was adopted, and then Cornets à deux pisions were introduced, while at the present day we have metal instruments with three and four pistons, ranging from the highest to the lowest brass instruments, each susceptible of a chromatic scale, not one sound of which is of a closed nature. best instruction-book for the cornet-a-piston is that by Komig.

CORNICE, kor'-nis (Fr. corniche), in Arch., the name of the upper part of the entablature (see ARCHITECTURE) which comes immediately above the frieze. It is

divided into two principal parts, the upper of which paris, the apper of which projects considerably be-yond the lower, being supported by modillons or mutules. The fillet, which composes the lower part, with an echinus moulding and smaller fillet above it, from which the modillous project, and an ogce, or bed-mould below it, which separates below it, which separates it from the frieze, is generally enriched with dentils, especially in the Corinthian and Composite orders. The upper part is subdivided into two portions,—the coro-



ns, which rests on the modillons, and the cynatium, which surmounts the corona. The term cornice is also applied to the ornsmental moulding projecting from the upper part of the walls of a room immediately

under the ceiling.

CORNISH CRUCIBLES. (See CRUCIBLES.)
CORNS, korns (Aug.-Sax.), are certain small, hard,
troublesome excrescences on the feet, arising from a thickening of the cuticle or epidermis, and owing generally to irritation, caused by excessive pressure or friction on the part. Corns are of two kinds,—lard and soft, the latter being situated between the toes. Frequently a bursa, or bag, is formed beneath the corn. which is apt to inflame and cause great pain and irritation. In the treatment of corns, the great object is to remove all undue pressure or friction; and for purpose, the boots or shoes should be easy and pliant. This will be still further effected by protecting the corn with a small piece of thick soft leather, spread with diachylou or other emollicut plaster, and having a hole in the centre corresponding with the size of the corn. The feet should also be frequently bathed with warm water, and as much as possible of the corn carefully pared away, care being taken not to wound the more sensitive part. If the corn is very sensitive, it ought to be occasionally touched with lunar caustic; and if much inflamed, a warm bread poultice should be applied to it.—Ref. Sir B. Brodie's Lecture on Corns and Bunions, in Medical Gazette of 13th February, 1836.

CORNUS, kor'-nus (Lat. cornu, horn, the wood being held to be duruble and hard as horn), in Bot., the typical

#### Corolla

gen. of the ast, ord, Cornaces, including several useful plants. The bark of C. forida is much esteemed in North America se a substitute for Peruvian bark is the treatment of intermittent and remittent fevera. the treatment of intermittent and remittent fevers. The fruit of C. mascula, the cornelian cherry, is astringent, and has an acid juice, which is used by the Turks for flavouring their sherbets. The seeds of C. seasoninea, the common dogwood of our hedges, yield a fixed oil, adapted for burning in lamps.

CORDY, kor'o-de (Ital. corredo, provision), is species of incorporeal hereditaments being a right of sustenance, or to receive certain allotments of victual and voyering for one's maninearnes.

and provision for one's maintenance.

COBOLLA, ko-rol'-la (Lat., a little crown), in Bot., the inner envelope of the flower, consisting of leafy organs called petals, and situated, in a complete flower, between the calyx and the stamens. It is generally the most conspicuous whorl of organs, being more or less coloured. It is, in fact, that part of the plant which usually delights us most by its gay appearance and fragrance. Petals are rarely green, though occasionally this colour is mot with, as in some Cobaas, in Hoya viridiflora, Gonolobus viridiflorus, and Penta-tropis spiralis. When there is but one whorl of entropis spiralis. When there is but one whorl of enveloping organs in the flower, it is regarded as the calyx (which see), and the flower is said to be apetaloid. A petal is often narrowed below into a staklike portion unalogous to the petiole of a leaf, as in the wallflower; the narrowed portion is then termed the unguis or claw, and the expanded portion the limb. Such a petal is said to be unguiculate or clawed. The shapes of petals are indicated in botanical descriptions by terms easily understood; such as oblong, lanceolate, elliptic, orbicular, coatc, and cordate, applied to the outlines, and concure, tubular, and bout-shaped, applied to the forms of petals which are not flat. In describing their direction, the terms erect, countent, divergent, and reflexed, are used in the same sense as when applied to the parts of the calyx. The petals, like the sepals, may be either distinct, or more or less united into one body. In the former case the corolla is said to be polypetalous or dialypetalous, in the latter, monopetalous or gamopetalous. In number of petals in a polypetalous corolla is indicated by a prefix, as in the case of a polysepalous calyx: thus a corolla of two petals is said to be dipetalous; of three, tripetalous; of four, tetrapetalous, and so on. When the petals are all of the same size and form, the corolla is termed regular; when they vary in these particulars, it is said to be irregular. We

give below the more important forms of the regular polypetalous corolla Cruciform. - This corolla gives the nat. ord. Cruciferæ its name. It consists of four petals, usually with claws, as in the wallflower (see figure, in which two of the petals show the claws), but sometimes without claws, as in the ce-



CRUCIFORM COBOLLA.

landine, and the whole arranged in the form of a cross. Caryophyllaceous, -consisting of five petals with long claws inclosed in the tube of the calyx, and with their limbs commonly placed at right angles to the claws, as in the lychnis, placed at right angles to the claws, as in the lydning, single pink, carnation, and catchify. Rosaccous,—composed of five petals, without, or with very short claws, and spreading in a regular manner, as in the strawberry and single rose. There are many anomalous forms of the irregular polypetalous corolla to which no particular names are applied. There is one form, however, of great importance, namely, the Papi-lionaccous. This derives its name from the fancied resemblance which it bears to a butterfly (papilo). It & composed of five petals, one of which is superior and larger than the others, and is termed the standard. or verillum; two are inferior, and usually more or less united, so as to form a somewhat bost-shaped cavity.

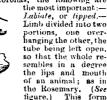
called the keel or carina; and two are lateral, and termed the wings or als. This curious form is common termed the warge or acce. Ann surrous to he various species of pea, and a vast number of plants which form the sub-ord. Papilionaces of the Leguminoes. When the petals unite, so as to form a monopetalous corolla, various terms are used; as in the case of the monosepulous culyx, to indicate the degree of adhesion; such as partile, cleft, toothed, and entire. (See Calxx.) The part where the union has taken place is called the tube; the free portion the limb; and the crifice of the tube, the throat or fuex. The monopetalous is regular when the parts are of the same size and form, and united so as to form a symmetrical body; it is irregular when these conditions are not complied with. The most noteworthy forms of the regular monopetalous corolla are distinguished



CAMPANULATE COROLLA

out, as in the central florets of many composite plants, hke the Chrysanthemum, and Ragwort, Chrysanthemum, and Miltoil. Campanulate, or bell-shaped. — Rounded at the base, and gradually enlarging to the summit; as in the Harebell. (See figure-a, stigma; b, corolla; c, calyx.) Infundibuliform, or funnel-shaped; as in Convolvulus and Tobacco. Hypocrateriform, or salner-shaped.—The tube long and narrow, and the limb at right angles to it; as in Phlox, Auricula, and Primrose. Rotate, or wheel-shaped.—Tube short, otherwise similar to the preceding

form; as in Forget-me-not. Urcsolate, or pitcher chaped .- Swollen in the middle, and contracted at both the base and spex; as in the Purple Heath. Of irregular monopetalous corollas, the following are



(See

This form

LABIATE COROLLA.

is common to most of the plants included in the nat. ord. Labiata. Personate, or masked.—Resembling the labiate in being divided into two lips; but distinguished by the lower lip being approximated to the upper, so as to close the orifice of the tube or throat. It is seen in the Snap-dragon and Toadflax. The Calceolate, or slipper form, which occurs in Calceolaria, is but a slight modification of this form. Ligulate, or strap-shaped .- A tubular corolla, partly split open on one side; as in the whole of the florets of the Dandelion, and in the florets of the ray of the Chrysanthemum and Daisy. Digitalior glove-shaped .- Somewhat bell-shaped, but alightly irregular; as in the Foxglove. The corolla, whether polypetalous or monopelalous, is subject to various irregularities, arising from the expansion or growing outwards of one or more of the petals into processes of different kinds. Thus, in the Snapdragon and Valerian, the lower part of the tube becomes di-lated on one side, so as to form a little bag, and the corolls is then termed acceute or gibbous. Sometimes a petal, or the tube of a monopetalous corolla, becomes prolonged downwards, so as to form a spur. Examples of sparred or carcarate petals or corollas may be seen in the Heartsease, Columbine, Tondflax, and Red Valerian. On the inner surface of the petals of many flowers there are curious appendages in the form of scales or hair-like proceases. Sometimes these scales proceed in state from the palace to the abbay, accompare more or less adherent, and form a cup-shaped panied by the representatives of foreign powers, both process; as in Narcissus: to this the term crown is commonly applied, and the corolla which exhibits it is said to be crowned. If the corolla falls as the flower great officers of state, and the noblemen heuring opens, as in the Grape-vine, it is caucous; if it falls the regalia, and then proceed to the royal household, proced in state from the palace to the abbay, accompanied in the same times of the sovering is received by the series of the royal household, proced in state from the palace to the abbay, accompanied in the foreign the palace to the royal household, proced in state from the palace to the royal household, proced in state from the palace to the royal household, proced in state from the palace to the royal household, proced in state from the palace to the subset, and the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the sovering at the west entrance of the abbay, the solution at the west entrance of the abbay, the solution at the west entrance of the abbay, the sovering at the west entrance of the abbay, the solution at the west entrance of the abbay, the solution at the condition at the

sistent, and then it usually becomes dry and shrivelled, as in Heaths and Campanulas, and is said to be mar-cescent. (The above remarks are abridged from Bentley's Manual of Botany, to which reference should be made by those requiring fuller information respect-

ing the various forms of the corolla.)
Corollary, kor'-ol-li-re (Lat. corollarium, properly signifying a gratuity or donation to an individual over and above his due), is usually employed to designate a necessary consequence of a proposition.—In Geom, it is a consequence drawn from some proposition already demonstrated, without the aid of any other

proposition. CONOLITELORE, ko-rol-le-flor'-e, in Bot., a sub-class of Dicotyledones, comprising those plants which have flowers furnished with both calyx and corolla, the latter being composed of united petals; the stamens are inserted on the corolla or ovary, or free and arising from the thalamus. The Corolliforæ are subdivided into-Epiquia, in which the calve is adherent, and the ovary consequently inferior; Hypostuminea, in which the stamens are inserted into the thalamus, and do not adhere to the corolla, while the ovary is superior; and Epipetalæ, or Epicorollæ, in which the corolla arises from the thalamus, and has the stamens attached to it, the ovary being superior. Fifty-eight natural orders are included by Professor Bentley in the sub-class; namely:—Subdivision 1. Epigyne.—Capritolisecæ (the Honeysuckle ord.), Columbliacew, Valerianacew, Dissacacew ord.), Columbliacew, Valerianacew, Dissacacew (the Madder) and Nothernacew, Campaigner Comments. (the Tezel ord.), Calyceraceæ, Compositæ, Campanulacer, Lobeliacer, Goodeniacers, Stylidiacers, Vacciniacer, Lobeliacers, Goodeniacers, Stylidiacers, Vacciniacers, Ericaces (the Heath ord.), Monotropicers, Pyrolacers, Epigaridacers, Subdivision 3. Epipetake.—Ebenaces (the Ebony ord.), Aquitou-aces (the Holly ord.), Sapotaces, Styracaces, Apo-cynaces, Loganiaces, Diapensiaces, Stilbaces, Gen-tianaces (the Gentiaa ord.), Asclepiadaces, Con-cessional Polymoriaces (the Phlox Convolvulacese, Cuscutacese, Polemoniacese (the Phlox ord.), Solanaces (the Potato ord.), Atropaces. (the Deadly Nightshade ord.), Oleaces (the Olive ord.), Jasminacese, Salvadoracese, Myrsinacese, Ægiseracese, Primulaceæ (the Primrose ord.), Piumbaginaceæ, Plantaginaceæ, Hydrophyllaceæ, Boraginaceæ, Ehretiacem, Nohanacea, Labiata, Verbenacea, Myoporacea, Scharianeea, Pedaliacea, Gesneracea, Crescentiacea (the Calabash-tree ord.), Bignoniacea, Acanthacea, Serophulariacea (the Fig.wort ord.), Orobanchacea, (the Broom-rape ord.), Lentibulariacem. The natural orders placed in the first subdivision were included by De Candolle in the Calycifloræ; the Corollifloræ of his system being made up of those monopetalous orders in which the corolla is hypogynous, and the ovary consequently superior. The arrangement followed in this work is preferable, as it makes the monopetalous corolls the essential mark of the Corolliflora.

CORONATION, kor-o-nai'-shun (from Lat. corona, & crown), is the act of crowning or consecrating a king. The practice is very encient, as we read in Scripture of the coronations of Solomon and of Jossh, the son of Ahaziah. Generally it has been accompanied by audinting with oil, which probably originated with the Jews. In the history of England, after the kingdoms of the heptarchy became united, the ceremony coronation is frequently alluded to; but the first English coronation of which we have any detailed account is that of Richard I. Minute accounts of many of the coronations since that time have been preserved. formulary generally followed in coronations since Edward III. is contained in the "Liber Regalis," preserved with great care in the archives of the dean and chapter of Westminster. On a coronation the great officers of state, the archbishops, bishops, peers, peeresses, and others, assemble at Westminster Abbey. The sovereign, with the princes and princesses of the blood royal, attended by the officers of the royal household,

## Coronation Oath

the royal anthem, and the speciators welcoming him with shouts of congratulation. He proceeds to a chair of state called the *Recognition Chair*, and, after the authem is concluded, the archbishop of Canterbury declares him to be the undoubted sovereign of this declares him to be the undoubted sovereign of this realm. The king next passes to the altar, and there makes the first offering; and, after returning to the chair of state, the Litany is read by two bishops, and the communion service by the archbishop, assisted by a bishop. The sermon is next preached by the archbishop of York or the bishop of London, after which the oath is administered by the archbishop of Canterbury. A hymn is then sung, and the archbishop reads a prayer, which is followed by the anthem "Zadok the priest and Nathan the prophet." The archbishop them snoints the king on the lead and hands in the form of a cross with the consecrated oil, pronouncing form of a cross with the consecrated oil, pronouncing the words, "Be thou anointed with holy," &c. The investiture then takes place, and the archbishop, having consecrated the crown with prayer, with the maying consecrated the crown with prayer, with the assistance of the other bishops, places it on the sovereign's head. The peers and peercases present all put on their coronets, the bishops their caps, and the kings of arms their crowns, amid the acclamations of the assembly, the sounding of trumpets, and the firing of crum. The henclation is then propounced after of guns. The henediction is then pronounced, after which the Te Deum is sung. The enthronization is then performed; and, by the assistance of the arch-bishop and bishops, the sovereign is placed in the royal throne, and the exhortation "Stand firm and fast," &c., pronounced. The homage is next performed; the archbishop first, for himself and the other lords spiritual, repeating the words of the homage, followed by the royal dukes, and then the senior of each rank in the peerage for his own degree. The holy sacrament is next administered, after which the final prayers are read, and the blessing pronounced. The sovereign then, after having exchanged the robe of state for the royal robe of purple velvet, returns to the palace in the

Same state as he proceeded to the abbey.

Cobonation Oath is the oath administered to a sovereign on his coronation. By it he solemnly promises and swears to govern according to the statutes established by parliament and the laws and customs of the realm; to administer law and justice in mer. y; to maintain the laws of God, the true profession of the gospel, and the Protestant reformed elegion established by law; and to preserve unto the bishops and clergy of the realm, and to the churches committed to their charge, all such rights and privileges as by law do or shall appertain to them or any of them. The oath is administered in the form of question and answer by administered in the form of question and answer by the archbishop of Canterbury; after which the sove-reign, kneeling before the altar, repeats the words, "The things which I have here before promised I will perform and keep, so help me God," and then kisses the Book. The coronation oath, and the alterations which it has undergone, are amply discussed by Mr. Taylor in his Glava, of Regality.

Taylor in his Glory of Regality.

CORONER, kor'-o-ner.—The office of coroner is a very ancient one at the common law. He is called coroner, coronator, because he has principally to do with pleas of the crown, or such wherein the sovereign is more immediately concerned; and in this light, the lord chief justice of the Queen's Bench is the principal coner justice of the queen's Bench is the principal coroner of the kingdom, and may, if he pleases, exercise the jurisdiction of a coroner in any part of the realm. But there are also particular coroners for every county in England, usually four, but sometimes six, and sometimes fower; and in every borough having separate quarter sessions, a coroner is appointed, with exclusive jurisdiction within the borough. This officer is of equal antiquity with the sheriff, and was ordained with him to keep the peace when the earls gave up the wardship of the county. He is chosen by all the free-holders in the accient county court; but the crown and certain lords of franchises, having a charter from the crown for that purpose, may appoint coroners for certain precincts or liberties by their own mere grant, and without election. He is chosen for life, but may and without election. He is chosen for life, but may be removed by being made sheriff, which is an office incompatible with the other, or by the writ de coronatore exonerando, on account of engagements in other business, incapacity by years or sickness, or for that he has not a sufficient estate (lands to the amount of

## Corporation

twenty pounds per annum) in the county, or lives in an inconvenient part of it, or is guilty of extortion, negled, or mistelawiour. He may appoint a deputy by writing under his hand and seal. His duties are udicial or ministerial; but his principal duty is to inquire, when any person is slain, or dies suddenly or in prison, or under suspicious circumstances, concerning the manner of his death. He is also to inquire concerning shipwrecks, and certify whether wreck or not, and who is in possession of the goods. Concerning treasure-troop, he is also to inquire who were the finders, and where it is, and whether any one be suspected of having found and concealed a treasure. He is a conservator of the queen's peace, and becomes a magistrate by virtue of his appointment, having power to cause felons to be apprehended, whether an inquisition have been found against them or not. His ministerial office (as the sheriff's substitute) is to exeministerial office has the sheriff sausstatue) as to exe-cute process in cases where the sheriff may be sus-pected of partiality, as that he is interested in the suit, or of kindred to either the plaintiff or defendant.— Ref. Jervis On the Office and Duties of Coroners.

COBONET, kor'-o-net (Lat. corona, a crown), an inferior kind of crown worn by princes and noblemen as distinctive tokens of their several degrees. They will be found illustrated and described under CBOWN

CORPORAL, kor'-por al (Fr. caporal, Ital. capo, head), in Mil., the designation of a non-commissioned officer who ranks next to a sergeant, and immediately above a lance corporal. It is the duty of the corporal to reliere and place sentries. When the regiment is on parade, he falls into the ranks with the privates. The corporal receives a somewhat higher pay than a private, and is distinguished by wearing two chevrous on. his arm. (See CHEVRONS.)

CORPORAL (Lat. corpus, a body) is the name given to the linen cloth which is spread over the consecrated bread (corpus, or body) after the communion. In the Romish and Greek churches it is an object of great reverence, and the folding and unfolding of it by the priest at the altar is accompanied with much ceremony, It is said to represent the wrapping of the body of our Lord in fine linen by Joseph of Arimathea. The cor-poral oath is derived from the ancient usage of touch ing the corporal to add solemnity to an oath.

CORPORAT PUNISHMENT. (See Flogging.)
CORPORATION, kor-por-uv-shan (Lat.), is a body
politic or incorporate, so called as the persons are
made into a body, and of espacity to take and grant, &c.; or it is an assembly and joining together of many into one fellowship and brotherhood, whereof one is flead and chief and the restare the body, and this bead and body kuit together make the corporation; also it is constituted of several members, like unto the natural body, and framed by tiction of law to endure in perpetual succession. Of corporations, some are sole, some aggregate: sole, when in one single person, as the queen, a bishop, dean, parson, vicar, or the like; aggregate, which is most usual, consisting of many persons, as mayor and commonalty, dean and chapter, &c. Likewise corporations are spiritual or temporal: spiritual, as bishops, deans, archdeacons, parsons, vicars, and other ecclesiastical persons; temporal, as mayors, commonalty, bailiffs, and burgesses, &c., of towns and boroughs; and some corporations are of a mixed nature, composed of spiritual and temporal persons, such as heads and fellows of colleges and hospitals, &c. Lay corporations are of two sorts,—civil and eleemosynary. The civil are such as are erected and elemosynary. The civil are such as are erected for a variety of temporal purposes, as the king or queen, to prevent the possibility of an interreguam or vacancy to the throne, and to preserve the possessions the built built built. of the crown entire; a mayor or commonalty, bailif, and burgesses, or the like, for the good government of a town; others for the advancement and regulation of commerce, as the trading companies of London and other towns, and public companies instituted by act of parliament or royal charter, and others for the better carrying on of divers special purposes, as the colleges of Physicians and Surgeons, the Royal Society, the Society of Antiquaries, &c. Among these the general corporate bodies of Cambridge and Oxford must be

ranked, which are not strictly spiritual or ecclesiastical, being composed of more laymen than clergy; neither are they eleemosynary foundations, though stipends

are sunexed to particular magistrates and professors, and these stipends are preceded by service and duty. 

\*\*Riemosynary are such as are constituted for the perpetual distribution of the free alms or bounty of the founder to such persons as he has directed or as the mode of government has been defined. Of this kind are all hospitals for the maintenance of the poor, sick, and important and all colleges both in our prisonicity. are all nospitals for the maintenance of the poor, sice, and impotent, and all colleges, both in our universities and out of them. Corporations, both sole and aggregate, may purchase, take, and hold land to them and their successors, as natural persons may hold them and their sire; but they are subject to the provisions of the law as to devises to charitable uses and the statutes of mortmain, and must have a license from the crown to enable them to hold or alien their lauds in mortmain; but aggregate corporations, when of the corporations sole, are in general restrained by statute from alienation of their lands, beyond the life of the person who constitutes the corporation sole or is the ead of the corporation aggregate. Power is nevertheless given to them, in some cases, to grant long building leases. Corporations aggregate may sue and be sued, and do all other acts, by their corporate name. Their corporate property only, and not the members individually, is amenable to judgments given against them. Their acts are under their common seal. There are some personal acts, however, as to which convenience has introduced an exception to this rule. Thus to a bailiff to make a distress. It may make by-laws or private statutes for the better government of the corporation, not contrary to the laws of the land, or contrary to or inconsistent with its charter, or manifestly unreasonable. It must appear by attorney, for it cannot in person. It cannot maintain or be made it cannot in person. defendant to an action of battery or the like; but it may maintain an action for breach of contract, and, in some cases, may be sued in such action as defendant. It is also liable to an action for damages in respect of any tortious acts committed by its agents, and is even liable in certain cases to an indictment, as where it allows a bridge, the repair of which belongs to it by law, to fall into decay; but in general it can be guilty of no crime in its corporate capacity. It may or no crime in its corporate capacity. It may also, under certain circumstances, be the subject of bankruptcy; as in the cases of joint-stock, banking, and other companies, founded by statute or charter for trade or profit. Aggregate corporations that have by their constitution a head, can do no acts during the vacancy of the headship, except only appointing another. There may be a corporation aggregate constituted without a head, as the collegiate church of Southwell, in Nottinghamshire, which consists only of Southwell, in Nothinghamshire, which consists only of prebendaries, and the governors of the Charterhouse, London, who have no president or superior, but are all of equal authority. The act of the major part is esteemed the act of the whole. No chattel interest can go to a corporation sole. There are several subjects relating to corporations which cannot, for want forward when heart such as a the mode of of space, be entered upon here; such as the mode of creating them; some other powers and capacities not before noticed; the mode by which they are visited for the inquiry into and correction of abuses; and the method of dissolving them. For the consideration of these, the student is referred to elementary treatises on the subject. (See MUNICIPAL CORPORATIONS.)

CORPOBATION, ACTS OF. (See TEST AND COMPORA-

TION ACT .) CORPS, ker (Ir. corps, Lat. corpus, a body), the name given in Mil. to any body of troops, without reference to the number of men of which it is composed. It can be applied with equal propriety to a regiment or battalion, consisting of many companies, or to a single company, as in the case of volunteer compa, when the company is isolated, and known by a distinctive number and title.

Cours n'Amnis, kor-dar-may (Fr.), a term applied to the large sections into which the military forces of Europe are divided in a time of peace. The British army is not large enough to be divided into corps, but in many continental states the military strength is m many commences neares the mintary excentives to be elected from the scholars, and the scholars from divided into a number of corps, each complete in itself natives of certain specified dioceses and countries. By as a sum of the present statutes, which have been recently amended, service. Every corps d'armé is subdivided into four it is provided that both follows and scholars shall be

corps, belonging respectively to the cavalry, infantry, artillery, and engineers. Among the French, 100,000 men, being considered too many to form one army, are divided into two or more corps d'armée. In the Russian system, the military strength is divided into about twelve corps, which are stationed in different districts throughout the empire. The Austrian forces are also divided in a similar manner.

CORPULENCE, kor'-pu-lens (Lut. corpulentia, fro corpus, the body), is an undue bulkiness or size of the body, arising from an excessive accumulation of fat in certain parts. It is impossible to define exactly the limit beyond which the body can be said to be corpulent, depending, as it does, very much upon the general habit and the state of health of the individual. It most commonly takes place after the age of forty, but is not confined to any particular period of life, being to be found also in childhood and youth. The causes of corpulence are both natural and acquired. There are some persons who have a natural tendency to corpu-lence; in others it may be induced by modes of life, indolent and sedentary habits, and the use of certain kinds of food. The undue accumulation of fat produces a variety of effects, interfering with the vital energies of the body, and incapneitating for exaction. The chances of life are not so great among persons of a corpulent habit as among those of a normal condi-tion. All sudden or violent measures to get rid of corpulence are attended with harm; and not the least daugerous is the popular remedy of vinegar, which has the effect of destroying the digestive powers. Attention to diet, and the avoidance of such articles as tend to generate fat, together with active exercise and the counteracting of indolent habits, are among the best means that can be employed. Dr. Chalmers, in his small treatise "On Corpulence," gives a variety of cases in which liquor potasses was used with great effect; but this remedy should not be resorted to without the sanction of a medical advisor. There are numerous very remarkable cases of corpulence on record. Of modern instances known in this country, was Bright of Maldon, in Essex, a respectable tallow-chandler and grocer, who died the 12th of November, 1750, in the twenty-ninth year of his age. He weighed 616 lbs. : and it is said that seven persons of ordinary size could be inclosed in his waistcoat. Daniel Lambert, who is supposed to have been the heaviest man that ever lived, died at Stamford, in Lincolnshire, at the age of forty, on the 21st June, 1809. He is said to have weighed 52 stone 12 lbs.. or 740 lbs.

weighed 52 stone 12 lbs. or 120 lbs.
CORPUS, kor'-pus (Lat., body), is a term applied in Anat. to certain rarts of the animal structure; as the corpus callosam, the corpora quadrigemina. It is also applied to a collection or body of laws or canons:

as Corpus juris civilis, Corpus juris canonici.
Corpus Curisti (Lat., body of Christ), is the name of a festival of the Church of Rome, instituted by Pope Urban IV. in 1264, in honour of the consecrated host, and with a view to its adoration. It is observed on the Thursday of the week after Pentecost, and is kept as one of the greatest festivals of the Roman Catholic church.

CORPUS CHRISTI COLLEGE, CAMBRIDGE, was founded in 1352 by two societies, or guilds, in Cambridge, called the guild of Corpus Christi and the guild of the Virgin Mary; and at first the college bore both names. Afterwards it acquired the name of Bene't College (by which it is still often distinguished), from the adjoining church of St. Benedict. It has twelve followships,—eight open to all the queen's subjects, wherever born; two are appropriated to natives of Norfolk, and two to the Norwich scholars on Archbishop Parker's foundation. All the fellows are required to take holy orders within three years after their election, and the degree of B.D. within eight years after that of M.A. There are also a large number of scholarships and exhibitions connected with this college, some of them being of connected with this college. siderable value.

CORPUS CHRISTI COLLEGE, OXFORD, was founded in 1516 by Richard Fox, bishop of Winchester, for a pre-sident, twenty fellows, and twenty scholars, the fellows to be elected from the scholars, and the echolars from

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Buch

# Correction, House of

elected without any restriction as to place of birth. The scholarships are tenable for five years from matri-oulation, and are of the annual value of £80, together with rooms rent free. There are aso four exhibitions of the same value, and tenable for the same period as the scholarship.—Ref. Oxford University Calendar, 1871.

CORRECTION, HOUSE OF. (See PRISONS.) CORRELATION OF THE PHYSICAL FORCES, kor-rel-Lorentz (Lat. con, with; relatio, a throwing back), the reciprocal relation between gravitation, the molecular forces, heat and light, electricity, and animal force. (See FORCE.)

CORRIDGE, kor'-r-d-or (Mal. coridore), a long passage or college in a managion, or any large huilding, which

or gallery in a mansion, or any large building, which dependent, and have no other means of communication with each other. A corridor may be closed, or open to the air on one side.

CORROSION, kor-ro'-zhun (Lat. con, and rodo, I gnaw), the gradual eating or wearing away of any substance, such as a metal, under the action of acids, by means of which its nature is completely changed by slow

CORROSIVE SUBLIMATE, in Chem., bichloride of mer-

oury. (See Mercury, Bighloride of.)
Corsair, kor-saire' (Ital. corso, a race), a term applied generally to sea-robbers or pirates, but originally used to designate those pirates in the south of Europe who sailed from Algiers, Tunis, Tripoli, and the ports of Morocco. They were directed by their princes to attack the merchant-vessels of nations with whom they were at war.

CORSET, kor'-set (Fr.), a tight-fitting under-dress or stay for the body, worn by females. It generally consists of cloth, and is stiffened by whalebone or other means, and tightened by a lace.

CORBICAN MOSS. (See GRACILARIA.)
CORSLET, kors'-let (Fr.), a light body-armour, worn
by the pikemen about the middle of the 17th century. Sometimes the term is employed to designate the entire suit under the title of a corslet, complete or furnished, which included the headpiece or gorget, as well as the tasses which covered the thighs.

CORSNED, Or MORSEL OF EXECUATION, kors'-ned (Sax. corsnede, a compound of cors, curse, and sned, a piece or mouthful), was a form of trial or purgation made use of anciently in England. A morsel of bread was consecrated by exorcism, and was administered to a suspected person as a test of his innocence. If the person was guilty, it was held that the bread would remain in the stomach and produce pallor and convul-sions; if the person was innocent, the bread would act s a wholesome and nutritious morsel. Some state that the holy sacrament was given to the suspected person with the coraned, while others believe that the latter was nothing else than the sacramental bread itself. It is related in the old English chronicles, that Goodwin, earl of Kent, during the reign of Edward the Confessor, after declaring himself innocent of the death of the king's brother, took the corsned, which, sticking in his throat, killed him,

CORTES, kor'-tez (Sp.), is the name given in Spain and Portugal to the assembly of representatives of the nation. These assemblies have been variously constituted, and possessed of various powers, at different times in these countries. They have existed from an early period, but their origin is involved in obscurity. In Spain, on the decline of the Moorish power, as district after district was recovered by the Christian princes, we find certain political corporations rising up and limiting the power of the princes. In the two principal states (formed by the union of a number of smaller ones), Castile and Aragon, the three estamentos, or states of the clergy, nobility, and inhabitants of enfranstates of the etergy, nomery, and inheotrants of entran-chised towns, were represented in the Cortes. In Aragon the Cortes appointed a judge, who decided all questions and disputes between the king and his sub-jects, and confined the royal power within constitu-tional limits. In Castlie the rights of the states were less marked, and in particular the privileges of the burgher class, were less extensive than in Aragon. In both countries, however, the king was dependent on the Cortes. After the union of the two kingdoms, Ferdinard and Isabella succeeded in making themselves

# Corymb

independent of the Cortes; and afterwards, when the Castilians attempted to oppose an extraordinary text, at a meeting convoked at Toledo by Cherles I. in 1538, the king abolished this assembly of the states. After this neither the clergy nor nobility were assembled, but deputies from eighteen of the cities were sometimes convened, only, however, when subsidies were to be granted. The special privileges of the Aragon Cortes were much shridged by Philip II, in 1591; and after the Spanish war of succession, Philip V. deprived those provinces which had adhered to the Austrian party of the privileges that still remained to them. party of the privileges that still remained to them. From that time the Cortes were only convened to pay homage to the king or the prince of Asturias, or when nomage to the king or the prince of asturias, or men a question respecting the succession to the throne was to be determined. After 1713 they did not meet till 1789, on the accession of Charles IV. In 1809 the Cortes were assembled by the Junta, and in 1812 gave out a new constitution. This extraordinary Cortes was succeeded by the the ordinary Cortes alorted according to were assembled by the extraordinary Cortes was succeeded by the ordinary Cortes, elected according to the new constitution, in 1813; but it was dissolved by Ferdinand, on his return in 1814, and the new constitution abrogated. Numerous changes in the constitution abrogated. Numerous changes in the constitution abrogated. ferdinand, on the tution abrogated. Numerous changes in the pulse, which our tution and Cortes have since taken place, which our tution and Cortes have since taken place, which our tution and cortes have since taken place, which our tution are from entering upon. Since 1848 they have been accustomed to meet and debate; but being possessed of little power, they have generally been employed to give weight to one or other of the contending factions. The history of the Cortes of Portugal is nearly the same as those of Spain.

CORUNDUM, ker-un'-dum, in Min., a nineral containing pure alamina, and occurring in hexagonal prisms of great hardness. When coloured and transparent, corundum constitutes sapphire, and the gran-

ular variety is known as emery.

Converre, kor-vet' (Fr.), in Mar., a sloop of war, an advice-boat, having fewer than twenty guns.

Corvus. (See Cnow.)

CORYLACER. OF CUPULIFERE, kor-il-at'-se-e (Gr. korus, a lelmer, the calyx enwrapping the fruit).

Bot., the Oak fam., a nat. ord. of dicotyledonous plants, in the sub-class Monochlamydee. Trees or shrubs, with alternate leaves, usually feather-veined and simple, with deciduous stipules. The flowers are monocious, the male being clustered or in amenta, with from five to twenty stamens into the base of a membranous relivate calvy, or of scales, the female membranous valvate calyx, or of scales; the female solitary or clustered, surrounded by an involucre of bracts, which ultimately form a cupule round the every, which has three or more cells. The fruit is a glaus or nut. The plants of this order abound in the forests of temperate regions, and a few occur in the high lands of tropical climates. They are of great importance as timber-trees: many yield edible seeds, and some have astringent barks and cupules. There are about 280 known species, which have been arranged into 10 genera, the most noteworthy being Querens (the Oak), Corvlus (the Hazel), Fagus (the Beech), Castanea (the

Chestnut), and Carpinus (the Hornbeam).
CORYLUS, kor'-e-lus (Gr. korus, a helmet), in Bot., the typical gen. of the nat. ord. Corylaces, which includes the common hazel (C. acellana), a shrub well known as the original source of many kinds of edible The wild hazel of our woods yields the nuts which are gathered with so much pleasure by schoolboys; and varieties of the same species produce the different kinds known as the White, Red, and Jerusalem filberts, the Great and Clustered cobs, the Red Smyrna, the Black Spanish, and the Barcelons nuts. The importation of nuts into this country is on an average 150,000 bushels a year. The cil obtained from them by expression is occasionally employed by artists and watchmakers. From the branches of the hazel good charcoal is prepared. CORYMS, kort-imb (Lat. corymbus), in Bot., the name given to a particular form of inflorescence. It is a kind of raceme (which see), in which the peduncles

kind of raceme (which sed), in which the pedundess (flower-stalks) become gradually shorter as they approach the top, so that all the flowers are about on a level. It occurs in some species of Cerusus, in the hawthorn, and many familiar plants. When the stalks or secondary axes of a corymb, instead of bearing flowers immediately, divide and form tertiary axes, a compound corymb is produced, as in some species of

## Corymbifere

CONVENTIFIER, ker-im-bif-er-s (Let, corymbus, and fero, I bear), in Bot, the name given by Jussieu to a sub-ord. of the Composite, which consisted of plants having florets all twhlar and perfect, or having tubular and perfect florets in the disk, and tubular and pistiliferous, or ligulate, florets in the ray. The genus Chrystuthemum may be taken as an example. Two species of this genus grow wild in Britain; namely C. leucanthemum (the ox-eye) and C. segetum (the corn marigold). In our gardens a number of beautiful varieties of the species C. indicum, sincuse, and others, are cultivated. They are hardy plants, and are remarkvarieties of the species C. macum, americ, and others, are cultivated. They are hardy plants, and are remarkable for the number and the varied colours of their flowers, which appear late in the autumn. There is a fine show of blooming chrysanthemums in the gardens of the Inner Temple. London. every season.

of the Inner Temple, London, every season.

Correa, kor-i'-fi (Gr. koruphe, the summit, the leaves growing only on the top), in Bot., a gen. of palms. It includes one remarkable species, namely C. imbraculifera, the talipot palm of Ceylon, from which leaves quantities of sure are obtained.

which large quantities of sago are obtained.

COSMETIC, kos-met'-ik (Gr. kosmeo, I adorn), is a preparation used to whiten or soften the skin, or otherwise to beautify and improve it. With the ancient

Romans, the term cosmeta was applied to those slaves who were employed to dress and adorn their mistresses. Cosmogonr, kos.mog'o.ne (Gr. kosmos, the universe; gone, generation), the science which relates to the formation of the universe, as distinguished from cosmography, which treats of the universe as we see it, and from cosmology, which treats of the actual and permanent state of the carth as it is. Cosmography has been embodied as a science by Baron Humboldt, in his celebrated work entitled "Cosmos." All cosmogonists may be divided into two great classes,those who believe that the world sprang into existence at the order of the Almighty, and those who hold that the universe is in itself the body and being of Deity, and, assuch, has been in existence through all eternity. The former are termed Theistical cosmogonists, and the latter Pantheistical.

COSMOPOLITAN, kos.mo-pol'-i-tãn (Gr. kosmos, world; polites, citizen), a citizen of the world; a person who makes himself at home wherever he goes, who has no fixed residence, and is nowhere a stranger and an alien.

COSMORAMA, kos-mo-rā'-mā (Gr. kosmos, the world, and horasin, to see), an exhibition in which various scenes illustrative of remarkable events and different parts of the world are shown. The effect of the pictures is beightened by throwing artificial light upon them; and they are viewed through lenses of great magnifying power, which makes them appear to be wonderfully natural and life-like.

COSMOS. (See Cosmogony.)

Cossus, kos'-sus, a gen. of night-flying moths, having the following characteristics :- Antenne long, rather slender, furnished on the inner edge with a series of transverse elevated ridges, which resemble the teeth of a saw; two distinct palpi, thickly clothed with scales, and each three-jointed; head small, upper wings longor and larger than the lower; body large. (See GOAT-MOTH.)

Cosrs, kosts (Germ. Dan. kost), are the charges to which a person is subject in a legal proceeding, and are a necessary appendage to judgments, but are payable in various interlocutory and other proceedings. The first statute which gave costs eo nomine to the plaintiff, was the statute of Gloucester, 6 Edw. I. e. 1, as did the statute of Marlbridge, 52 Hen. III. c. 6, to the defendant in one particular case relative to wardship in chivalry, though, in reality, costs were always considered and included in the quantum of damages in such actions where damages are given; and even now costs for the plaintiff are always entered on the roll as increase of damages by the court. With the exception which has been mentioned, no costs were allowed to the defendant in any case till the sta-tute 23 Hen. VIII. c. 15, since which divers statutes have tupe 23 Hen. VIII. c. 15, since which divers statutes have been passed, both as regards plaintiff and defendant, and rules and orders of the courts have been made re-specting them. Paupers, that is, such as will swear hemselves not worth five pounds in the world, except their wearing apparel and the matter in question in the cause, are exempt, when plaintiffs, from the pay- the cotton-plant was extensively cultivated, and it

#### Cotton Manufacture

ment of court fees, and entitled to have connecl at attorney assigned to them by the court without fe and are excused from paying costs when unsuccessfu but shall suffer other punishment, at the discretion the judges. In modern practice, no instance, however of the award of any punishment in such cases has o curred; but a person thus suing in forma pauper may recover costs though he pays none for the counse and clerks are bound to give their labour to him, by not to his antagonists. And if a plaintiff shall bring a action of covenant, debt, detinue, or assumpsit in heing for breach of named at the contract of the c being for breach of promise of marriage), and he sha not recover more than twenty pounds; or, in an actio of trover or case, and he shall not recover more tha five pounds, provided any such action is cognizable i a county court, unless the judgment be by default, c unless it be certified by the judge who tries the cause or it appears to the court itself that there was suff or it appears to the court itself that there was sufficient reason for bringing the action there. To the general rule, however, there are certain exceptions as where the plaintiff dwells more than twent miles from the defendant, or where the cause cation did not arise wholly, or in some materia point, within the jurisdiction of the county cour within which the defendant dwells or carries on he lustiness at the time of the action being appearance. business at the time of the action being commenced. c (in general) where an officer of the county court is party. In cases between party and party, the cost are taxed by an officer of the court, who reduces o increases any of the charges, according to a certain scale governed or fixed by rules of the court, or at his discretion where the item is not included in such scale and, as between an attorney or solicitor and his client either party may have the costs taxed. (See ATTORNEY.

COSTUME, kos-tume' (Fr.), the term ordinarily at plied to the garments, robes, &c., of a people; thu the kilt, plaid, and hose of the mountaineers of Scot land are termed the Highland costume. The seve ral peculiarities in the dresses of doctors, masters of arts, bachelors, and undergraduates, constitute wha is generally called the costume of the university, o scademical costume. — A rule or precept in Paint ing, by which the artist is enjoined to make every per son and thing depicted sustain its proper character and not only observe the story, but that the circum stances, the scene of action, the country or place, th habits, arms, manners, &c., exactly correspond.

Coterie, ko-ter-e' (Fr.). a friendly or select party

a club or association limited to a small number c individuals. The word is of French origin, and is sur posed to have been derived from the Latin quot, ho many. In the 13th or 14th century, when merchant joined together in an enterprise, they formed a coteric and each subscribed his quota. It soon lost this signification, and now only refers to exclusive societies.

COTLING, ko-lil-yan (Fr., an under petticont), brisk French dance executed by eight persons. It was very popular in France at the conclusion of the las century, but was superseded by the quadrille, which i

itself a modified form of the cotilion.

Corrage, kol-tij (Ang. Sax.), a small habitation detached from other buildings, and generally one storhigh. The name was originally applied only to dwelling of a very humble kind, but it is now used to designate a great variety of buildings, from the ornamental cot tages of the French to the Swiss chalets. The rara cottages of England are fained as being the most beau tiful; they are generally clean and neat in the interior and picturesque and ornamental outside. A great dea of attention has been given of late years to the accom modation of agricultural cottages.

COTTON. (See GOSSTPIUM.)
COTTON, GEN. (See PYROXYLIN.)
COTTON MANUFACTURE, keit-in (Fr. coton, Ital
cotione, probably from the Arab. ketun, fine).—Thi
branch of industry, which was known in India am
China many centuries before it was introduced int Europe, is now one of the most important manufactures of Great Britain. Herodotus is the first of the Greek writers who mentions cotton: he calls it tree wool. Both the Greeks and Romans imported their cotton from India. At the present day the inhabitant of China are principally clothed in dresses made o native cotton woven at home. About the 10th century

A A

# Cotton Manufacture

produce woven into cloth by the Moors in Spain, where the manufacture flourished for some time, especially at Barcelona. The cloths made were of coarse texture, and a large quantity was used for sail-cloth. On account of the prejudice against the Moorish population, the traffic in manufactured cotton was only carried on with africa and the East. In Italy cotton fabrica began to be made about the same period. From that country the manufacture passed into the Netherlands, and was brought into England by Protestant refugees after the capture of Antwerp by the duke of Parma in As early as 1641 Manchester began to be noted as a town where cotton was manufactured. Before as a town where cotton was manufacture. Before the invention of Arkwright, the cotton manufacture in England was of very slight importance. Arkwright's patent for spinning by rollers was taken out in 1769. Previous to that year the weavers, dispersed in cottages scattered throughout the district, purchased the cotton with which they worked. Having supply is and wown it scattered throughout the district, purchased the cotton with which they worked. Having spun it and woren it into cloths, they took their goods to market, and sold them on their own account. The rapid growth and prodigious magnitude of the cotton-manufacture of Great Britain form one of the most extraordinary phenomenants with history of industry. In 1200 the March nomena in the history of industry. In 1760 the Man-chester merchants began the system of distributing the supplies of cotton wool among the weavers by means of agents. A few years afterwards, Hargreave, an ingenious but illiterate weaver, invented the spin ning-jenny,- a machine by which eight threads could be spun at a time, against one by the distaff or spinning wheel. This invention was much opposed by the working weavers in the district. They destroyed his working weavers in the district. They destroyed his machine, and compelled him to leave his native place. A few years afterwards, Richard (afterwards Sir Richard) Arkwright, a hardresser, brought out his machine for spinning by rollers. The principle of the patents taken out by Hargreave and Arkwright were combined by Mr. Committen, who should be former. combined by Mr. Crompton, who shortly afterwards invented a piece of mechanism called the mule-jeung. It produced a much finer yearn than either of the other machines. Crompton received a grant of £5,000 from the government for his service. At first the mule-jenuics consisted of not more than thirty spindles each; now they frequently contain 1,000 to 2,000 spin-dles, with which threads have been produced 1,000 miles long, and only one pound in weight. The first steam-engine for a cotton-mill was constructed by Mr. Watt in 1785. At this time the application of the improved machinery was confined to the production of yarn; and as the difficulty had formerly been to find thread enough to supply the looms, so now it seems to have been feared that it would be impossible to find a sufficient number of weavers to work the thread that was spun. Dr. Cartwright, however, supplied this great desideratum by his invention of the power-loom. invention was followed by the cylinder printing-machine, mechanical engracing, and the processes of calico-printing and bleaching. (See Calico-puinting and bleaching. (See Calico-puinting has been further facilitated by the self-acting mule of Messrs, Sharp, Roberts, & Co., of Manchester. These machines do not require the named of a contraction. but can be attended to by a boy or girl, whose duty it is to join the threads which break during the spinning. A great variety of apparatus and a large number of machines have been invented of late years; but, for the most part, they consist of extensions or improvements of the inventions of Hargreave, Arkwright, Crompton, Cartwright, and Roberts. The ordinary process of cotton manufacture is as follows:—The raw material, when it arrives at the cotton-mill, is first taken to the mixing-room. The contents of each bug are spread out in a horizontal layer of uniform thickmess, the contents of the several bags forming separate

# Cough

cotton is then passed through the spreading machine, and afterwards wound in a fleecy state upon a large wooden roller. In this state it is conveyed to the carding machine, where it is drawn out into parallel layers. (See Carding-Mackins.) Each of these layers is made to undergo compression in its way to a willow from which it is introduced. roller, from which it is given off in the form of a thick. soft thread, into a tin can. This thread is called a sliver. The next stage is termed drawing, and the machine employed is called a drawing-frame. The sliver is passed through the drawing-frame, which completes the process begun by the carding-machine, the fibres of the cotton being arranged longitudinally in a uniform and parallel direction. This drawing opera-tion is repeated several times, in order to correct all inequalities. The next process is rowing,—a continua-tion of the drawing. The cord, which is now called a rove, being much thinner, has a slight twist given to it by passing through a can, which is made to revolve with great velocity while receiving it. It is then wound upon hobbins, and is ready for the spinning-frame. As the spinning and weaving of cotton differ very slightly from that of silk, linen, woollen, &c., they will be found described under the articles SPINNING and WEAVING. Sea-Island and long-stapled Egyptian cotton are the varieties from which the finer kinds of yarn are spun; and from them muslins, laces, &c., are made. Cambrics, shirtings, calicoes, &c., are made from Brazilian and the better classes of American cotton. Coarse yarns, used for making fustians and other heavy fabrics, are made from the inferior quali-ties of America and Surat. From wefts of wool or worsted and warps of cotton several varieties of Coburg and Orleans cloths, mousselines de laine, damasks, &c., are made. The Yorkshire broadcloths are sometimes one-half cotton. Fabrics are also made of linen and cotton, silk and cotton, &c. The continent of Europe was formerly the largest consumer of yarn made in England, but now the principal demand comes from India and Chius.

COTTUS, kot'-tus (Gr. kotta, a head), the name of a gen, of spiny-finned fishes, characterized by the large Size of the head; whence their name. There are two species of this genus to be found in British seas,—the sea Scorpion (Cottus Scorpio) and the Father-lasher (Cottus bubalis).

COTYLEDON, ko-til-e'-don (Gr. kotule, a cavity, in allusion to the cup-like leaves), in Bot., a rudimentary leaf, forming part of the embryo of a flowering plant. (See EMBRYO.)

COTYLEDON, in Bot., the Navelwort, a gen. of plants belonging to the nat. ord. Crassulaceæ. The species C. umbilicus is a common plant on walls and rocks in the West of England. It has long been in use as a popular remedy in hysteria, and as an external application to destroy corns and warts. Of late years it has been frequently employed as a remedy for

COTYLEDONES, ko-til-e-do'-nees, in Bot., a name sometimes applied to the sub-kingdom Phanerogamic

or flowering plants. (See systematic arrangement of plants in the article BOTANX.)

COUCAL (Egyptian), koo'-kül (Centropus couptus), a bird about filteen inches long. The feathers of the head and neck are of a metallic greenish hue, which colour, passing to a duller tint, marks the bird's upper parts generally, while the under portions are white. They are solitary in their habits, breeding in holes in trees, and feeding on insects and small reptiles. Its note somewhat resembles that of our cuckoo; indeed, the Arabs call the bird hou-hou, from its repetition of these syllables.

COUGH, kof (qu. Du. kuch), is a spasmodic action of the respiratory organs, occasioning a violent and sonorous expulsion of air from the lungs. Coughing ness, the contents of the several bags forming separate layers. The heap is then trampled or pressed together. The cotton of which this bing, as it is called, is composed is then torn down by a rake from top to bottom, and a portion of each layer thus obtained. If the layers consist of different qualities of cotton, a uniform mixture is thus obtained. The quantity raked down is then conveyed to the veucleing or willowing machine, where it is dragged through two rollers, transferred to two beaters, which thrash out all sand, seeds, and traches, and bronchi are endowed with a very high other mixture is thus obtained. The quantity raked down is a layer so that the sir-passages to the lungs should be perfectly free from any obstruction; and hence the larynz, two beaters, which thrash out all sand, seeds, and traches, and bronchi are endowed with a very high other rollers and a second set of beaters. The cleansed foreign body causes the most violent excitement.

#### Coumerin

Conghing, then, is occasioned by an irritact in these parts, and is an attempt to get rid of the irritation. The air from the lungs is suddenly driven up with great force through the air-passages, so as to carry with it any causes of irritation that may be present in them. Cough may also be excited by irritant vapours or gases, or may arise from an abnormal sensibility of the lining membrane. In most cases cough is attended with expectoration, but sometimes it is quite dry. When the mucous membrane of the air-passages is unduly stimulated, the vessels become overloaded with mucas, and coughing is produced to effect its discharge, as is frequently observed in catarrh. This kind of cough is often a chronic disease in old age, and is frequently very troublesome. The dry cough, which is mostly unattended by any expectoration, is obviously of a nervous character, and is observed in highly irritable, nervous, and hysterical constitutions. The treatment of cough, when symptomatic of any other disease, will be found noticed in other parts of this work; as Caranen, Brokeniris, Pirmusis. When it is occas oned by the irritation of the mucus, it is to be treated with demulecut; as mucilaginous drinks and liquorice. Stimulants and full diet are to be avoided, and inflammatory symptoma carefully guarded against. Sedatives, expectorants, and aperients are often very useful in effecting a cure. Great relief is frequently afforded by the use of the warm foot-bath and warm gruel, with a ten-grain Dover's powder after the patient is in bed, and then plenty of covering to encourage perspiration. In dry coughs should never be neglected; for they are frequently symptomatic of organic disease, or may induce it. If they do not yield to simple remedies, medical

definity symptometro to game traces, of many induces.

1. If they do not yield to simple remedies, medical advice ought to be sought.

Counsily, koo'-mārin, in Chem., C<sub>18</sub>H<sub>2</sub>O<sub>4</sub>, an odoriferous crystalline principle, found largely in the Tonka or Tonquin bean (see Dipperxxx), the common realists and in the process remediate versus of the process vernal grass. in the sweet-scented It is to this odoriferous principle that the pleasant scent of new-mown hay is due; and by combining the essential oil of Tonka-beans with other scents, perfumers are accustomed to imitate with great accuracy the odour of a field of new-mown hay. It is easily extracted from the Tonka-bean by digesting the wdered seeds in alcohol. On evaporating the alcopowdered seeds in anomon. On the problem of holic solution, crystals of commarin are obtained, which may be decolorized by digestion with animal charcoal and subsequent recrystallization. It melts at 122 boils at 518°, at which temperature it may be distilled unaltered. Its vapour has an agreeable aromatic It has a burning taste, and is but slightly soluble in cold water : warm dissolves it readily, de positing it in silky crystals as the solution cools. It forms several substitution compounds with chlorine, iodine, bromine, and nitrous acid. A most irregular and somewhat auomalous compound is formed by its union with teroxide of antimony. On treating it with perchloride of autimony dissolved in hydrochloric acid, a compound is formed having a composition indicating the union of an atom of coumarin with an atom of the union of an atom of coumarin with an atom of teroxide of antimony. Boiled with a solution of potash, coumarin assimilates the elements of water, and becomes transformed into coumario acid, which mitted with the potash. Coumaric acid is obtained in brilliant transparent plates by decomposing a solution of coumarate of potash with hydroculoric acid.

COUNCIL, koun'-sil (Lat. concilium, Fr. concile), in a general sense is a number of persons summoned or convened together for consultation or advice. In modern politics, it is generally used to designate an assembly intended to assist the sovereign, and composed of members whose chief business it is to discuss, advise, legislate, or decide; it being the duty of the ministers to execute. In England, Alfred, to whom we are indebted for so many wise institutions, had three councils, through which all the business of the nation passed. The first was a select council, to which only those high in the king's confidence were admitted, corresponding to the present council. The third was the wittenagement, or general council of the nation, which was inde-

#### Conneil

pendent of the king. In the present day, the queen has a variety of councils to select her in the discharge of her duties, the maintenance of her dignity, and the exercise of her prerogative. The first of these is the high court of parliament (which see): 2. the pears of the realm, who are by their birth hereditary counsellers of the crown, and may be called together by the sovereign to impart their advice in all matters of importance to the realm, either in time of parliament, or, as has been their principal use, when no parliament is in being. A third council belonging to the queen is, according to Sir Edward Coke, her judges of the courts of law for law matters. But the principal council belonging to the queen is the privy council (which see), which is generally, by way of eminence, called the council. The cabinet council (which see) is composed of the more distinguished members of the privy council, to the number usually of about fifteen.

COUNCIL, in Eccl. Hist., is an assembly of prelates and other spiritual persons convened for the purpose of deliberating and making laws for the benefit of the Church. There are several kinds of councils:—1. General or occumenic councils, which are composed of representatives from all parts, summoned for the setting of points of universal interest; 2. national councils, composed of the bishops or clorgy of one kingdom or state, but whose decisions are not regarded as binding over the Church; and 3. provincial councils, convoked by the metropolitans in their respective districts.

The earliest councils were provincial; but sometimes clergy from distant parts attended, in consequence of express invitation. The metropolitan, as president came to acquire great influence in the provincial council, which at length became little more than an organ in his hands. Presbyters as well as bishops were admitted to deliberate and vote, and deacons were also present; but it is matter of doubt whether they were allowed to vote. Some are of opinion that the laity even had seats and votes in the early councils. The number of councils which have been held at various times is very great, amounting, according to some authorities, to 1,500 or 1,600. Of general or com-menical councils, the number is by no means so great; but the different churches are by no means agreed as to what are to be regarded as such. The Greek church only acknowledges seven, and the Roman Catholics reckon eighteen; but even the different sections of the latter church are not agreed as to the individual councils that are to be included in the list. The French reject those of Lyons, Fiorence, and the Fifth Lateran, and receive in their stead those of Pisa, Constance, and Bâle, which the Italians reject. The following is a list of the general councils according to the Roman church : the first eight were called by the emperors. and the rest by the popes. The principal of them will be found more particularly noticed under their own names in other parts of this work. 1. The Council of Nice, which was convened at the city of that name in 325, and which condemned the Arian heresy and drew up the creed known as the Nicene; 2. the first Council of Constantinople, which was convoked by the emperor Theodosius the Great in 381, and which confirmed more definitely certain points of the Nicene creed against the Arisus, and condemned the Macedonian heresy of doming the division of the Nicene creed heresy of denying the divinity of the Holy Ghost; 3, the Council of Ephesus (431), which condemned the Nestorian heresy; 4, the Council of Chalcdon (451), which condemned the errors of Eutyches and Dioscorus, who affirmed that Jesus Christ had but one nature; 5. the Second of Constantinople (553), which condemned the doctrines of the "Three Chapters" (see Chapters, Three) and the heresies of Origen, Arius, Macedonius, and others; 6. the Third of Constantinople (680) confirmed the canons of the five previous councils, and condemned the heresy of the Monothelites, which asserted that there was only one will in Christ; 7. the Second of Nice (787) condemned the Iconoclasts, and sanctioned the worship of images in the churches; 8. the Fourth of Constantinople (869) confirmed the worship of images, deposed Photius from the see of Constanti-

ninges, deposed from the see of consistant nople, and restored Innabus; 9. the first Council of Lateran (1123) decreed that investiture was the soloma right of the Church; 10. the second Council of Lateran (1139) confirmed the election of Pope Innocent II.,

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and condemned the heresies of Peter de Bruis and Arnold of Breecis; 11. the Third Lateren (1179) condemned the "errors and impisties" of the Waldenses and Ahigenses; 12. the Fourth Lateren (1215) took up many points of mbrality, and condemned various heresies; 13. the first Council of Lyons (1246) ordered a new crusade for the recovery of the Holy Land, and excommunicated Frederick II. of Germany; 14. the Second of Lyons (1274), for reforming discipline and this morals of the clergy, and effecting a union with the Greek church; 15. the Council of Vienne (1311) condemned the order of the Templars, and confiscated demned the order of the Templars, and confiscated their property; 16. the Council of Pias (1409) deposed Gregory XII. and Benedict XIII., and elected Alexander in their stead; 17. the Council of Constance ander in their stead; 17. the Council of Constance (1414) deposed the three contending popes and elected Martin V. in their place, and condemned the doctrines of Huss, Wickliffe, and Jorome of Prague; 18. that of Basie (1431), called to effect a reform in the Church, or Basis (1431), cased to enert a reform in the Church; and to bring about a union with the Eastern church; 19. the Council of Florence (1439) effected a reconciliation between the Eastern and Western churches; but the act was afterwards disavowed by the great body of the Eastern church; 20. the fifth Lateran council (1512), for the suppression of the pragmatic sanction (which see), and the strengthening of the power of the Roman see; 21. the Council of Trent (1545), for the reformation of ecolesiastical abuses and the condemnation of the reformed principles. (See SYNOD.)

COUNCIL OF WAR is an assemblage of the principal officers of a fleet or an army, summoned by the admiral or general, for deliberation or consultation, or to assist him by their advice.

COUNCIL, TOWN. (See TOWN COUNCIL.).
COUNSEL, or COUNSELIOR, koun'-sel, is, a person retained by a client to plead his cause in a court of judicature, or to advise him privately, as it is called, in chambers, although the etiquette is not to receive instruction from reading adjunt account through instructions from or to advise a client, except through the intervention of an attorney, solicitor, or proctor. Among the civilians, counsel are called advocates; but in the courts of common law and equity, there are two species or degrees,—barristers and serjeants. The former we have dealt with under the word BARRISTER, and we shall treat of the latter in the proper place. From both these degrees some are usually selected to be her Mujesty's counsel learned in the law, the two principal of whom are her Majesty's attorney and solicitor-general. Queen's counsel must not be employed in any cause against the crown, without special license. A custom has of late years prevailed of granting letters-patent of precedence to such barristers as the crown thinks proper to honour with that mark of distinction, whereby they are entitled to such rank and pre-audience as are assigned in their respective patents; sometimes after the queen's attorney-general, but usually next after her Majesty's counsel then being. These, as well as the queen-consort's attorney and solicator-general (when the sovereign is a king), rank promiseously with the king's counsel, and, together with them, sit within the bar of the respective courts, but are not sworn, and therefore are at liberty to be retained in causes against the crown. A counsel cannot maintain an action for his fees, which are given not as locatio vel conductio, but as quiddam honorarium; not as a salary or hire, but as a mere gratuity. He is not answerable for any matter spoken relative to the cause in hand, and suggested in his client's instruc-tions, although it should reflect upon the reputation of another, and even prove absolutely groundless; but if he mentions an untruth of his own invention, or even if he mentions an untruth of his own invention, or even upon instructions, if it be impertinent to the cause in hand, he is then liable to an action from the party injured; and counsel guilty of deceit or collusion are panishable with imprisonment for a year and a day, and perpetul silence in the courts. Practising barristers are exempt from serving on juries, as parish constables, and are privileged from arrest in civil cases, whilst entire to staying at any returning from the whilst going to, staying at, and returning from, the apperior courts, quarter sessions, and, if previously retained, petty sessions. (Seg ADVOCATE, BARRISTER, SERTRANT-4T-LAW.)

Count, kount (Fr. conte, Lat. comes), is a title of dignity intermediate between duke and baron, and is, 575

properly, a nobleman who owns a domain spected into a county; but sometimes ambassadors and pienipotentiaries are styled counts without possessing the necessary territory. In England the title has never been used, sithough comes is regarded as the Latin equivalent for earl, and from a very early period the title countess has been given to the wife of an earl. In the times of the Roman republic the inferior officers, engh as the tringer preferts. For were known as the as the tribunes, prefects, &c., were known as the comites of their principal. As a title of dignity it was first used during the reign of Constantine, who, upon the foundation of the new capital, bestowed the dignity of comes upon ten out of thirty-five provincial generals. The Germans, Franks, and other nations vetsined the title, applying it principally to the governors of cities, just as duces, or dukes, designated those noblemen that were in command of provinces. During peace they administered justice, in war they commanded in the army. Under the last of the second race of French monarchs, the dignity became hereditary. In Germany, a count is called graf. (See GRAF.)
COUNT (Fr. compte), in Law, signifies the declaration

of the complainant in a real action. As declaration is applied to personal, so count is applied to real causes; but count and declaration are oftentimes confounded and made to signify the same thing; so the divisions of, or separate statements or allegations in, a declaration, indictment, or criminal information, are called

counts.

COUNTENANCE, kown'-ten-ans (Fr. contenance), the whole form of the human face, or system of the features.

COUNTER-IERITANTS, kown'-ter-ir'-rit-ants (Lat. con-tra, against), in Med., are certain substances applied: ra, against, in Alexi, are contain automated agrants to the skin in order to produce irritation at some distance from a diseased part, with a view to withdraw the inflammation or unnatural action from it. The slightest class of counter-irritants are rubefuncts, or such as merely redden the skin; vertoants, or such as produce vesicles or blisters, are a more powerful. class, and not only cause counter-irritation but prove evacuant; pyogenic counter-irritants, or suppurants, are still more evacuant. Setons, issues, and the actual cautery, also belong to the class of counter-irritants. There is no more valuable remedial agent than counter-irritation, and none more frequently employed with the best results; but it must be rightly timed and placed, not too soon, nor yet too near the seat of the disease. It should not be had recourse to until all acute action has fully subsided, otherwise it may not only fail in affording relief, but may aggravate the local and general disease. It should also be applied at some distance from the site of the original disorder, and yet not too far removed from it.

COUNTERMINE, kown'ter-mine (Lat. contra, Fr. contra, against; mine, mine), in Mil, when an attacking force are engaged in driving the gallery of a mine under any part of the fortifications of the besieged, the latter often drive another gallery towards the enemy's mine to destroy it, and prevent the injury which would be caused to their works if the mine exploded.

Counsel to their works it the mine expoded.

Countiberoint, koun'-ter-point, literally, point against point; so called from the points formerly employed in music instead of notes,—an important branch of musical science, which consists in the art of countries. posing music in several parts either for a variety of voices or instruments; now synonymous with harmony, and nearly so with composition; the only difference being, that composition implies more of invention and being, that composition implies more of invention and of imagination than counterpoint. The invention of the latter is involved in great obscurity; by some it is attributed to Guido (a native of Tuscany, who was born about 900); but, although he was the first to write on this subject, which had made little progress before his time, it is obvious that it was known to several of the earlier musicians. Its real origin appears to have been as follows:—When the organ was accompaniment to the voice, it gave a facility for producing several sounds simultaneously. This soor producing several sounds simultaneously. This soor led to the discovery that there were some sounds agreeable effects: the minor third appears to have been one of the first of these. Other harmonies were also used, which (without mentioning those em-

## Counterscarp

ployed by several authors before Guido) show the origin of the art, and at the same time prove it to have been totally unknown to the ancients. Primitive have been totally unknown to the ancients. Frimitive conticepoint is now called plain for simple counterpoint, to distinguish it from the modern figured or florid counterpoint, in which the melody is beautified and the general effect enriched by the frequent introduction of many successive notes in one part against a single note in another. When the laws of counterpoint began to be understood, you music came to be divided into the part of the laws of which was denominated into four parts, the lowest of which was denominated fewar, the next counter tenor, the third metotus, and the highest desplam and treble. About the middle of the 15th century these parts were increased to six, and were called bass, baritone, tenor, contracto, mezzosoprano, and soprano.

COUNTERSCAIR, koun'-ter-skarp (Fr. contre, against, or opposite; escarpe, scarp), in Mil., that side of the ditch which is opposite the rampart and the scarp below it. To form the outline of the counterscarp of the main ditch of a fortress opposite any of its sides, formed by two semi-bastions and the curtain between them, ares of circles should be described in front of the salient angles of the bastions from the angles themselves as centres, and a tangent drawn to the arc in front of each bastion from the shoulder of the other. These lines meet in a point in front of the curtain, which is called the angle of the counterscarp. ditch is thus contrived that it may be swept by cross-fires from the flanks. The counterscarp of a ditch wound an outwork is parallel to the rampart. Some-times it is revetted with masonry, and very steep; but if it be constructed to admit of a hasty sortic being made on the enemy by the garrison, it should slope in a gentle incline from the bottom of the ditch.
COUNTERSIGN, kown'-ter-sine (Lat. contra, against

signum, sign), the name given to a watchword selected by the officer in command, and privately communicated to the guards and sentries posted about a camp, or at the entrance to a fortress, who have strict orders not to allow any one to pass into the citadel, or within the lines, unless he can give this word, and thereby show that he has the authority of the commanding officer to enter.

COUNTER-TENOR CLEF, kown'-ter-ten'-or klef, in us., the name given to the C clef when placed on the third line, in order to accommodate the countertenor voice.

COUNTER-TENOR VOICE, vois, a term applied to the above G gamut to B or C above the treble clef note.

COUNTING-House, kown'-ting hows (Ang.-Sax.), the house or room specially appropriated by merchants, traders, and manufacturers, to the purpose of keep-ing their books, accounts, letters, and papers.

Country Dance, kun'-tre (Fr. contre danse), a lively pointed air, carculated for dancing. It is of French origin, and was at one time so popular as to be transplanted into almost every country in Europe. There are no established rules for the composition of airs to this dance, neither is it confined to any particular measure, so that any common lively song-tune may be adapted to it.

COURTY, koun'-te, in British Geog., meant at first but at the present time it is a term, so far as England and Scotland are concerned, synonymous with shire, the latter word coming from the Saxon, and the former from the French. In Ireland the term shire is not used as an equivalent of county; neither would it appear to be so used in the English colonies, or in the states of North America. Some of the English counties are almost identical with the old Saxon kingdoms Some of the English coun-As a territorial division, the county is a comparatively late introduction into Scotland; whilst in Ireland its recognition is still more recent. In all the counties of England, with the exception of Durham, Westmoreland, and Cumberland, sheriffs are appointed every Michaelmas term for the execution of the laws. The command of the militia of a county is vested in the lord-lieutenant. Other county officers are: —Justices of the peace, custodes ratulorum, high constable, bailiffs, and coroner. In England there are fifty-two counties, three of which, Lancaster, Chester, and Durham, are called counties palatine (from palatium, 576 •

#### Court

palace), because the chief officer had originally regapowers, or power to administer justice equal with the exercised by the monarch in his palace. Scotlan contains thirty-three counties; Ireland thirty-two.

COUNTY CORPORATE, in England, is a term applied to several cities or boroughs which, in consequence of extraordinary privileges, are enabled to form counties by themselves.

County Cours. (See Cours.)
Coup, koo (Fr., a blow), is a term used in various ways to convey the idea of promptness and force.
Coup d'état is a violent and arbitrary political measure;
coup de thédire, a sudden and striking charge in the action of the scene; coup d'œil, in military affairs, a rapid conception of the weakness and advantages of certain resilience. certain positions or arrangements of troops; coup de main signifies a vigorous, prompt, and decisive military attack.

COUPLET, kup'-let (Fr.), a pair of rhymes, two verses; a division of a hymn or ode, in which an equal number or equal measure of verses is found in each purt, called a strophe.

COUPONS, koo'-pon(g)s (Fr. couper, to cut), in Finance, is a term applied to any cheque, or other piece of paper, cut off from its counterpart. In a special sense, coupous are dividend or interest warrants, which are presented for payment by holders of debentures. All coupons in Great Britain must now bear a stamp,

COURANT, koo-rant' (Fr. courant, running, from Lat, currere, to run).—In Her., when any animal, such as a deer or a dog, is drawn running at full speed, it is described as conrant.

COURTER, koor'e-er (Fr.).—There are two classes of couriers,—public and private. Public couriers are employed by the government to carry dispatches expeditiously and safely to and from the ambassadors at foreign courts. They are accustomed to travel, able to speak several languages, and always ready, at a moment's notice, to set out either on horseback, by hired carriage, or by rail, night or day. They are acquainted with all the regulations of passporis, &c. Private couriers are servants employed by the opulent, when travelling in foreign countries, to facilitate their route, by going before to make preparations, and by looking after their lodgings and general accommodation.

Coursing, koars'-ing (Lat. curro, I run), the sport of hunting hares with greyhounds, which follow the game by sight and not by seent. The breed of greyhounds has greatly improved in this country, and coursing has become very popular. Coursing meetings are held in open parts of the country where here are abundant, and the owners of greyhounds enter their sequential dors for writing talls. A hidden is president. respective dogs for various stakes. A judge is appointed; whose duty it is to decide with respect to the merits of the dogs engaged. The sport then begins by two dogs being selected for a course. They are restrained by the "slipper," a man who holds them by a long strong the "supper," a man who holds them by a long strong cord, with a spring attached to their collars. The field is then beaten for a hare. When it is found, it is allowed 80 to 100 yards start, or "law," as it is called; the judge then gives the word "go," and the slipper frees the dogs by means of the spring. The judge follows the greyhounds through the whole course, and awards the victors to the dog which shows the freest nonway the greynounds through the whole course, and awards the victory to the dog which shows the great qualities of speed, endurance, and sagacity, and not necessarily to the dog which kills the hare. Coursing is of great antiquity, and is treated of by Arrian, who flourished a.D. 150. It was first practised by the Gauls, and was a popular sport with the ancient Greeks.

COURT, koart (Sax. curt, Lat. curia, a senate-house), originally meant the place inclosed by the buildings of a feudal castle; afterwards it came to denote the re-tinue or council of a sovereign. (See ROYAL HOUSE-

-In Law, a court is defined to be a place wherein justice is judicially administered; and as by our excellent constitution the sole executive power of our excellent constitution the sole executive power of the laws is vested in the person of the sovereign, it will follow that all courts of justice (which are the medium by which she administers the laws) are derived from the power of the crown; for, whether created by set of parliament or lotters patent, or subsisting by pre-scription (the only methods by which any court of judicature can exist), the queen's consent in the former

# Court, Admiralty

these couris the sovereign is supposed, an contempla-tion of law, to be always present; but as that is, in fact, impossible, she is there represented by her judges, whose power is only an emunation of the royal pre-rogative. For the more speedy, universal, and impar-tial administration of justice between subject and subject, the law has appointed a prodigious variety of courts,—some with a more limited, others with a more extensive jurisdiction; some constituted to inquire only, others to hear and determine: some to deterextensive jurisdiction; some constituted to inquire only, others to hear and determine; some to deter-mine in the first instance, others upon appeal, and by way of review. All these in their turns will be taken notice of in their respective places; but we may here mention one distinction that runs throughout them all; viz., that some of them are courts of record, others not of record. A court of record is that where the acts and judicial proceedings are enrolled on parchment for a perpetual memorial and testimony, which rolls are called the records of the court, and are of such high and supereminent authority, that their truth is not to be called in question; for it is a settled rule and maxim, that nothing shall be averred against a record, nor shall any ples, or even proof, be admitted to the con-trary. And if the existence of a record be denied, it shall be tried by nothing but itself; that is, upon inspection whether there be any such record or no, otherwise there would be no end of disputes; but if there appear any mistake of the clerk in making up the court will direct him to amend it. All courts of record are the queen's courts, in right of her crown and royal dignity; and therefore every court of record has authority to fine and imprison for contempt of its authority; while, on the other hand, the very erection of a new jurisdiction, with power of fine or imprisonment, makes it instantly a court of record. But the courts not of record, or those of them, at least, in which the common law is administered, are of in ferior dignity; and, in a less proper sense, the queen's courts, and these are not intrusted by the law with any power to fine or imprison the subjects of the realm, unless by the express provision of some act of parlia-ment. In these also the proceedings are not enrolled or recorded; but as well their existence as the truth of the matters therein contained, shall, if disputed, be tried and determined by a jury. In every court there must be, at least, three constituent parts,—the actor, reus, and judgs; the actor, or plaintiff, who complains of an injury done; the reus, or defendant, who is called upon to make satisfaction for it; and the judex, or iguicial power, which is to examine the truth of the lact, to determine the law erising on that fact, and, if any injury appears to have been done, to ascertain, and, by its officers, to apply the remedy. (As to appeals against the decision of different courts, see APPEALS.)

COURT, ADMIRALTY. (See ADMIRALTY.)
COURT, ARCHOPACON'S, is an ecclesiastical court, but the most inferior in the whole ecclesiastical polity. It is held before a judge appointed by himself, and called his official. Its jurisdiction, until the establishment of the Court of Probate, comprised the granting of probates and administrations. It has jurisdiction over sectesiastical causes in general arising within the court of the posts and administration of the posts of the archdeaconry, and in ordinary cases the party may commence his suit either in this court or the bishop's, though in some archdeaconries the suit must be com though in some archdeacouries the suit must be commenced in the former, to the exclusion of the latter. From the archdeacours court an appeal lies, by 24 Hen. VIII. c. 12, to that of the bishop.

COURT OF ARCHEN. (See ARCHEN.)

COURT OF BANKEREN. (See ARCHEN.)

COURT OF BANKERPTCY.—Jurisdiction in cases of bankruptcy is committed to certain commissioners and the the court of the court courts.

to the judges of county courts (except those of the metropolitan county courts), with a final appeal to the lords instices. There is also a subordinate jurisdiction given to the registrars of the several courts. The courts of the commissioners are held in the principal, or London district, in Basinghall Street, and the district courts are held in several previncial towns. The anbordinate powers of the registrars are defined by the Bankruptor Act of 1861, secs. 52 and 58; but they have no power to commit or to hear a disputed adjudication, or any question of the allowance or sus-

# Court of Common Pleas

pension of an order of discharge. The London conf as the power to transfer the proceedings from has the power to transfer the proceedings from one district court to another, or to a county court, and the majority in number and value of the creditors may resolve that the proceedings shall be transferred to the county court of any district other than the metro-politan district; and the court is to order the same accordingly. As we have before to some extent treated of the law of bankruptcy, and incidentally of the powers of the court, the reader is referred to the title Bankruptcy. RUPT.

Court Baron is a court incident to every manor in the kingdom, to be holden by the steward within the manor. This court baron is of two natures: the one a customary court, appertaining entirely to copy bolders, in which their estates are transferred by surrender and admittance, and other matters relative to their tenure only; the other is a court of common law, but not one only; the other is a court of common law, but not one of record, and is before the freeholders who owe suit and service to the manor, the steward being rather the registrar than the judge. It may hold pleas of any personal actions, of debt, trespass, on the case, or the like, where the debt or damages do not amount to forty shillings. But the proceedings may be removed into the superior courts, and, after judgments given a writ of false judgment lies to the courts at Westminster, to rehear and review the cause: which dirrumminster, to rehear and review the cause: which dirrumminster, to rehear and review the cause; which circumstances being productive of great veration and delay, this court has now fallen into disuse. (See COURT OF THE HUNDRED, and the statute there quoted.)
COURT, CENTRAL CRIMINAL. (See CENTRAL CRIMI

NAL COURT.)

COURT OF CHIVALRY is a court military held before COUNT OF CHIVALEY IS A COURT MALLEY HELD CALLEY HELD CALLEY HE CALLEY HELD COURTACE AND OTHER THAN COURT HELD CALLEY HELD CALL chivalry, and afterwards during our connection with the continent by the territories which our princes held in France, but has long since fallen entirely out of use, on account of the feebleness of its jurisdiction and want of power to enforce its judgments, as it can

want of power to enforce its judgments, at coan neither fine nor imprison, not being a court of record.

COURT OF THE CINQUE PORTS.—These have an exclusive jurisdiction (before the mayor and jurats of the ports), in which exclusive jurisdiction the queen's ordinary writ does not run. A writ of error lies from the mayor and jurats of each port to the lord warden of the Cinque Ports in his Court of Shepway, and from that to the Queen's Bench. (See CINQUE PORTS, and

Courts, Shepway.) COURT OF THE CLERK OF THE MARKET .- This court is the most inferior court of criminal jurisprudence in the kingdom; but is incident to every fair and market therein, to punish misdemeanours committed in such fair or market, as a court of pied poudre (which see) is to determine all disputes relating to private or civil property. The object of the jurisdiction is principally he cognizance of weights and measures, to try whether they be of the true standard thereof or not, which standard was anciently committed to the custody of the bishop, who appointed some clerk under him to inspect the abuse of them more narrowly; and hence,

this officer, though in most cases a layman, is called the clerk of the market.

COURT OF COMMON PLEAS, or, as it is sometimes technically called, the Court of Common Beach, is one of the three superior courts of common law, and is a court of record, and in that capacity takes cognizance of all actions between subject and subject, without exception, including formerly the extensive class of real ception, including formerly the extensive class of real actions, of which it still retains the few surviving species. (See ACTION.) And over remedies of this kind (which formerly excelled all others in importance) it has always exercised an exclusive jurisdiction, as it did also over fines and recoveries, while those modes of assurance existed, and still does over the forms of conveyance now substituted for them. For these reasons, and also because its authority in these matters, we would be a second of the case of the was original, and not usurped (as in the case of the Exchequer and Queen's Bench), it has always been considered as the principal seat of the learning relative to ordinary actions between man and man, and is styled by Lord Coke the lock and key of the common

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## Court, Consistory

isw. It has the excitaive jurisdiction of deciding questions of law relating to the rights of voters for members of parliament, in cases stated by revising barristers. It has no authority, however, like the Exchequer, in matters relating to the revenue. The judges are at present five in number, one chief and four pulsue justices, and from their decision proceedings in error may be taken into the Exchequer chamber. It is one of the three courts called the misperior courts, or the courts at Westminster, the other two being the courts of Queen's Bench and Exchequer.

COURT, CONSISTORY.—Every diocesan bishop has a court held in his cathedral for the trial of all ecclesiastical causes arising within his diocese, and in which probates and administrations were granted previous to the establishment of the Court of Probate. The bishop's chancellor, or his commissary, is the judge, and from his sentence an appeal lies to the archbishop of the province.

COURT, CONTENT OF.—Contempts of court are either direct, which openly insult or resist the powers of the courts or the persons of the judges who preside there, or else are consequential, which (without such gross insolence or direct opposition) plainly tend to create a universal disregard of their authority. All courts of record are the queen's courts, in right of her crown and royal dignity; and, therefore, every court of record has authority to fine and imprison for conor record has authority to me and imprison for con-tempt of its authority. The principal instances of either sort are the following kinds:—1. Those com-mitted by inferior judges and magistrates, by acting anjustly, oppressively, or irregularly, in administering those portions of justice which are intrusted to their distribution on he discharing the madistribution on he discharing the madistribution. distribution, or by disobeying the royal writs issued out of the superior courts; by proceeding in a cause after it is put a stop to, or removed by writ of pro-hibition, certiorari, error, supersedeas, or the like. 2. Those committed by sheriffs, bailiffs, gaolers, or other officers of the court, by abusing the process of the law, or deceiving the parties by any act of oppres-sion, extortion, collusive behaviour, or culpable neg-lect of duty. 3. Those committed by attorneys and lect of duty. 3. Those committed by attorneys and solioitors. (See ATTORNEY.) 4. Those committed by jurymen in collateral matters relating to the discharge of their office, such as making defaults when aummoned, refusing to be sworn or to give any verdict, eating or drinking without leave of the court, and especially at the cost of either purty, and other misbehaviour and irregularities of a similar kind; but not behaviour and irregularities of a similar kind; but not in the mere exercise of their judicial capacities, as by giving a false or erroneous verdiet. 5. Those committed by witnesses, by making default when summoned, refusing to be sworn or examined, or prevariesting in their evidence when sworn. 6. Those committed by parties to any suit or proceeding before the court by disobedience to any rule or order made in the progress of a cause, or other proceeding; as by non-payment of costs awarded by the court upon a section or by non-payment of costs awarded by the court upon a section or by non-payment of costs awarded by the court upon a section. motion, or by non-observance of awards duly made by arbitrators or umpires after having entered into a rule for submitting to such determination. However, the contempt in such cases as last mentioned is, in general consequential or constructive only; as it implies no setual disregard of authority, but may proceed from the poverty of the party. 7. Those committed by any the poverty of the party. 7. Those committed by any persons in the way of disobedience to the queen's write, or other disrespect to the court's authority, or writing to a judge privately on a matter before the court. Some of these contempts may arise in the face of the court; as by rude and contumelious behaviour by obstinacy, perverseness, or prevarication; by breach of the peace, or any wilful disturbance whatever: others in the absence of the party, as by disobeying or treating with disrespect the sovereign's writ, or the rules or process of the court, by perverting such writ or process to the purpose of private malice, extertion, or injustice; to the purpose of private malice, extortion, or injustice; by speaking or writing contemptuously of the court or indges acting in their judicial capacity; by printing false accounts (or even true ones against the prohibition of the court) of causes then depending in judicial or the court of causes then depending in judicial to the court in the performance of his duty, or treating the process of the court with actual disrespect or contempt; and by anything, in short, that demonstrates a gross want of that regard and respect which, when

# Court of Mischequer Chamber

once courts of justice are deprived of their authority (so necessary for the good of the kingdom) is entirely lost among the people. (See ATLORERET, COMMET. MENT.

COURT OF THE CORONER is a court of record, inquire into the matters referred to under the article COROWER, in loco. As there stated, his principal dut-CORONER, in loco. As there stated, his principal duty is to inquire into the deaths of parties, and in general be ought to hold his court super visum corporis, upon view of the body.

COURT, COUNTY .- The County Court; as it exists at common law, and independently of the branch new added to it by etatute, is a court incident to the jurisdiction of the sheriff. It is not a court of record, but might entertain all personal actions to any amount by wirthe of a special writ, called a justiceies, issued out of the common-law side of the court of Chancery. This power was taken away on the establishment of the new county courts. The freeholders of the county are the real judges in this court, and the shoriff is the minis-terial officer. terial officer. All outlawries of absoonding offenders are there proclaimed, and all popular elections, as of coroners, verderers, and knights of the shire, must be made in plene comitate, or in full county court. Proceedings are removable from hence into the superior courts by writ of pone or recordari, in the same manner as from hundred courts and courts baron; and the

ner as from indired courts and courts and the same writ of false judgment may be had in the nature of a writ of error. (See reference in Courts, Bonoven.) Court, Customart, is distinct from the Court Baron (although usually held at the same time). The Court Baron is that of the freeholders of a manor, whilst the Customary Court is that of the copyholders or customary tenants. It is held before the lord or lady of the manor, the steward, and a jury, culled the homage, or homage jury, who are tenants of the manor. The chief business at these courts is to admit tenants to their property on the death or alienation of the preceding tenant. The jury make presentments of de-faults and deaths of tenants, and assess fines for admittance of the tenants.

COURT OF DELEGATES was formerly the great court of appeal in all ecclesiastical courts, but its functions have been superseded by the Judicial Committee of have the Privy Council.

COURT OF EXCURQUER was at first intended principally to order the revenues of the crown, and to recover the king's debts and duties, though it has since acquired, and originally by usurpation, the additional character of an ordinary court of justice between subject and subject. It is called the Exchequer (seacourium) from the chequered cloth, resembling a chessboard, which covered the table there, and on which, when which covered the tang's accounts were made up, the mans were marked and scored with counters. It consists of two divisions,—the receipt of the Exchequer, and the court or judicial part of it. It formerly had jurisdiction as a court of equity; but this was transferred to the court of Chancery, except in matters of revenue. It is therefore now a court of revenue and a court of common law. In the former capacity it ascertains and enforces, by proceedings appropriate to the case, the proprietary rights of the crown against the subjects of the realm; in the latter it administers redress between subject and subject in all actions whatsoever, except in the few species of real actions which still survive the general demolition of that class. These are exclusively under the jurisdiction of the court of Common Pleas. the court of record, and its judges are five in number, consisting of one chief barons and four pushes barons, as in this court the judges are termed. It is one of the three courts called the superior courts, or the courts at Westminster, the other two being the court of Common Pleas and the court of Queen's Bench.

COURT OF EXCHEQUEE CHAMBER.—This is a court of appeal to correct the errors of other jurisdictions. of appeal to correct the errors of other jurisdictions. It exists—I, as a court of mere debate, such coases from the other courts being sometimes adjourned into it as the judges, upon argument, find to be of great weight and difficulty, before any judgment is given by them in the court below. It then consists of all the judges of the three superior courts of common law, and now and then the lord chancelor size. As a court of error. It they consists of the indees of the court of error. It then consists of the judges of the two superior courts other than that whose judgment

## Court Fool

is appealed against, sitting collectively as a court of error in the Exchequer chamber to revise such judg-ment. A writ of error lies from this court to the House of Peers.

Court Foot, a jester much employed in ancient times by nobles and wealthy persons, to enliven the time by jests and witty remarks. During the Middle Ages, the court fool became an indispensable officer. Ages, the court fool became an indispensable officer. He assally had his head shaved, and wore a fool's cap of gay colours, with ass's ears and a cock's comb. He often had bells attached to his cap, and earried a scentre variously formed. The dress, however, generally depended on the caprice of his master. Triboulet, the court fool to Francis I., king of France, obtained an historical reputation, as did also his successor Brusquet. English court jesters disappeared with the Stuart dynasty; one of the last examples being Armstrong, who died in 1646. Afterwards half-witted persons were employed as court fools by noblemen; but towards the end of the 17th and the beginning of the 18th century the custom was entirely abolished.

18th century the custom was entirely abolished.

COURT OF HIGH COMMISSION.—This was a court in causes ecclesiastical. It was erected and united to the legal power by virtue of the statute 1 Eliz. c. 1, and was intended to vindicate the dignity of the Church by reforming, ordering, and correcting the ecclesiastical

retorning, ordering, and correcting the eccessasticas state and persons, and all manner of errors, heresies, schisms, abuses, offences, contempts, and enormities. It was abolished by statute 16 Chas. I. c. 11.

Court of the Hundred is only a larger court baron, being held for all the inhabitants of a particular hundred, instead of a manor. The free suitors are liere also the judges, and the steward the registrar, as in the case of a court baron. Causes are equally liable to removal hence, and may be reviewed, as in the court baron, and in practice no resort to this court is ever made. By the 9 & 10 Vict. c. 95, s. 14, provision is made enabling the lord of any hundred, or of any hundred, are necessarily approached to the proper or liberty having any court in right honor, manor, or liberty, having any court in right thereof in which debts or demands may be recovered,

to current ment upits or temands may be recovered, to current to her Majesty the right of holding such court, after which it shall be discontinued.

COURT OF HUSTINGS. (See COURTS OF LONDON.)

COURT OF HRQUINY.—On some occasions, the crown directs a court of inquiry to be held in cases of breach of the Articles of War, the object of which is to ascertain the propriety of resorting to ulterior proceedings against the party charged.

COURT-LEET, OF VIEW OF FRANKPLEDGE, is a court of record, and held once in the year, but not oftener, within a particular hundred, lordship, or manor, before the steward of the leet. Its original intent was to view the frankpledges, that is, the freemen within the liberty. Besides this, the preservation of the peace and the chastisement of divers minute offences are its objects. The jurisdiction of the court is the same as that of the Sheriff's Tourn, or ancient County Court, and extends from common nuisances, and other material offences against the peace and public trade, down to eaves dropping, waifs, and irregularities in public commons. The court has grown into a state of desuctude, by reason of its holding its session so seldom, and of the business, for the most part, having devolved upon the quarter sessions.

COURT, LORDS JUSTICES' .- This is a court of appeal in Chancery, and consists of the lord chancellor and two judges, called the Lords Justices, and possesses all the jurisdiction exercised by the lord chancellor himself, so far as his judicial business in Chancery is conself, so far as his judicial business in Chancery is conserned, without prejudice, however, to his right to sit, as formerly, alone. To this court (the powers of which may be exercised not only by its full body but by either of its judges), together with the lord chancellor, or by both the judges apart from the lord chancellor, an appeal from the master of the rolls and each of the rice-chancellors may be referred, or may be entertained by the lord chancellor alone, sitting in his proses intradiction; and from these annellate invisions. per jurisdiction; and from these appellate jurisdic-tions an appeal in turn lies to the House of Lords. This is also the court of appeal in matters in bankruptcy

COURT OF OYME AND TREMINER, and General Gaol Delivery. The jurisdiction of this court will be found under ASSIZES.

COURT OF PARLIAMENT .- The high court of parliaent is the supreme court of the kingdom, not only for 579

# Court of Quarter Session

the making, but also for the execution of the laws, the trial of great and enormous offenders, wheth lerds or commencers, in the method of parliamenta impeachment. (See laws account of ledy the Queen in Parliament is held during the seek of parliament for the trial of an indicted poer, (See

LORDS, HOUSE OF.)
COURT OF PROVILLES is a branch amered to the COURT OF PECULIARS 18 a branch america to the Court of Arches. It has a jurisdiction over all those parishes dispersed through the province of Canterbury, in the midst of other dioceses, which are exempt from the ordinary's jurisdiction, and subject to the metropolitan only. All ecclesiastical causes arising within these peculiar or exempt jurisdictions are originally cognizable by this court, from which an appeal lies to

COURT OF Arches.
COURT OF PIED POUDER, OF FIE POWDER (curia pedia pulverizati), so called from the dusty feet of the suitors; or, according to Lord Coke, because justice is there done as speedily as dust can fall from the foot. But the etymology given us by a learned modern writer (Barrington's Observations on the Stat. 337) is much more ingenious and satisfactory; it being derived, according to him, from pied puldreaux (a pediar, in Old French), and therefore signifying the court of such petty chapmen as resort to fairs or markets. It is a court of record incident to every fair and market, though fallen into disuse, and now in a manner for gotten, of which the steward of him who owns or has the toll of the fair or market is the judge; and iss jurisdiction extends to administer justice for all com-mercial injuries done in that very fair or market, and not in any preceding one; so that the injury must be done, complained of, heard, and determined within the time during which the fair or market is held. court has cognizance of all matters of contract that can possibly arise within the precinct of that fair or market; and the plaintiff must make oath that the cause of action arose there. From this court a writ-of error lies in the nature of appeal to the courts at Westminster. The reason of its original institution seems to have been to do justice expeditiously among the variety of persons that resort from distant places to a fair or market, since it is probable that no inferior court might be able to serve its process, or execute its judgments, on both, or perhaps either of the parties; and therefore, unless this court had been exected, the complainant must necessarily have resorted, even in the first instance, to some superior judicature. Courts similar to the pie-powder courts were usual both with Greeks and Romans, who introduced fairs into Ger-many and the North.—Ref. Fosbroke's Dictionary of Antiquities

COURT, PRESENTATION AT. (See PRESENTATION AT COURT.)

COUPT OF THE PRIVY COUNCIL is the great court of appeal in all ecclesiastical causes, and those from the colonies, and was substituted for the former appeal colonies, and was substituted for the former appear court, viz. the Court of Delegates, which was composed of commissioners appointed under the great seal: Practically, all the judicial authority of the privy council is now exercised by a committee of privy councillors, called the Judicial Committee of the Privy Council, who hear the allegations and proofs and make their report to her Majesty in council, by whom the judgment is finally circumstants. given.

COURT OF QUARTER SESSION, or General Quarter Sessions of the peace, is a court that must be held in every county once in every quarter of a year, in the first week after each of the following days,—the 11th October, the 28th December, the 31st March, and the 24th June, before two or more justices of the peace, one of whom must be of the quorum. The jurisdiction of the court extends to the trying and determining of all felonics, misdemeanours, and trespasses, except all felonies, misdemeanours, and trespasses, except treason, nurder, or capital felony, which, when com-mitted by a person not previously convicted of felony, is punishable with transportation for life, and except certain other offences enumerated in the acts of 4 & 5 Vict. c. 88, of 5 & 6 Vict. c. 38, and 9 & 10 Vict. c. 25. Lts jurisdiction comprises offences relating to the game. laws, highways, alchouses, bastard children, the settle-ment and provision for the poor, servants' wages, and apprentices. Some of these are proceeded upon by indictment, and others in a summary way, by motion, and

# Court of Queen's Bench

order thereupon, which proceedings may for the mest part (unless guarded against by particular statutes) be removed into the court of Queen's Hench by writ of removed into one course to the court also manages the quashed or confirmed. The court also manages the mancial affairs of the county, and makes county-rates, and makes county and superintends the prisons and paper luntile as-lums in the county. As regards the county of Middle-set, two accisions, or adjourned assessons of the peace, are, by 7 & 8 Vict. c. 71, to be held in every calendar month, and the first sessions in January, April, July, and October respectively, are to be the general quarter assions of the county; and the second sessions in those months are adjournments of the general quarter ions; and a serjeant or barrister-at-law, of not less than ten years' standing, and in the commission of the man ten years standing, and in the commission of the peace for the county, and qualified by law to act as such justice of the peace, is appointed by her Majesty to be the assistant-judge of the court. In many municipal corporations or boroughs, there is also a court of quarter sessions of the peace, having, in general, the same authority in cases arising within the limits of the borough as the county quarter sessions within the county. But of such court the recorder of the borough is the sole judge, and he is to hold the court once in every quarter of a year, or at such other and more frequent times as, in his discretion, he may think fit, or her Majesty may direct. (See Custos Rotu-LORUM.

COURT OF QUEEN'S (or KING'S) BENCH, so called because the sovereign used formerly to sit there in person, the style of this court being coram ipso rege or regind. In the reign of a king it is called the King's Renck, and during the protectorate of Cromwell was styled the Upper Bench. It is a court of record and the supreme court of common law in the kingdom, consisting of a chief justice and four puisne justices, who are, by their office, the sovereign conservators of the peace and supreme coroners of the land. Yet though the sovereign himself used to sit in this court, and still is supposed so to do, he did not, neither by law is he empowered to, determine any cause or motion but by the mouth of his judges, to whom he hath com-mitted his whole judicial authority. The jurisdiction of this court is very high and transcendant. It keeps all inferior jurisdictions within the bounds of their authority, and may either remove their proceedings, to be determined here, or prohibit their progress below. It superintends all civil corporations in the It commands magistrates and others to do kingdom. what their duty requires in every case where there is no other specific remedy. It protects the liberty of the subject by speedy and summary interposition. It takes orgainance both of criminal and civil causes, the former on what is called the crown side, or in the crown office, the latter on the plea side of the court. On the crown side, or in the crown office, it takes cognizance of all criminal cases, from treason down to the most trivial misdemeanour or breach of the peace. Into this court indictments from all inferior courts may be removed by writ of certiorari, and the manner of trial in this court is either at bar (which rarely happens) or at misi prius. On the plea side, or civil branch, it enjoys a general jurisdiction and cognizance over all actions between subject and subject, chose of the real class only excepted, which are entertained by the court of Common Pleas. It does not meddle, however, with matters of revenue, which belong to the court of Exchequer. It is one of the three courts called the superior courts, or courts at Westminster, the other two being the courts of Common Pleas and Exchequer. A writ of error lies from this court to the Exchequer Chamber. (See CERTIORARI.)

Cours. Rolls, is one of the branches of the court of Chargery, presided over by a judge who is called the Marter of the Rolls, and who was originally appointed only, for the superintedence of the writs and records appetraining to its common-law department, tread also the with a positive of the write and records appetraining to its common-law department, records apperranting to its common-isw department, but accustomed also to sit on the equity side as a separate though subordinate judge. He has jurisdiction in all proceedings in equity, except such as, by the course of the sourt, are appropriated to the great seal slone. The set of 1 & 2 Vict. o. 04, vested in him the custody of the public records.

Court of Session. (See Session, Court or.)

# Courts, County

Court of Sawars is a temporary tribunal erected by virtue of a commission under the great real, which formerly used to be granted pro remain at the pleasure of the crown, but now at the discretion and nomination of the lord chancellor, lord treasurer, and chief justices, pursuant to the Statute of Sewers, 28 Hen. 2117.0.6. Their jurisdiction is to overlook the repairs of the hanks and walls of the sea-coast and navigable rivers, or, with the consent of a certain proportion of the owners and occupiers, to make new ones, and to cleanes such rivers and the streams connected therewith, and is confined to such county or particular district as the commission shall expressly name. The commissioners are a court of record, and may fine and imprison for contempt, and, in the execution of their duty, may proceed by jury, or upon their own view, and may take order for the removal of any annoyance, or the safeguard and conservation of the sewers within their commission, either according to the laws and customs of Romsey Marsh, or otherwise, at their own discretion. They may also assess such rates or scots upon the owners of lands within their district as they shall judge necessary; and if any person refuses to pay them, the commissioners may levy the same by sale of his goods and chattels, or sell his freehold or copyhold lands, in order to pay such scots or assessments. By 4 & 5 Vict. c. 45, they are also empowered, for the purpose of defraying such expenses incident to the commission as in the act particularized, to tax in the gross in each parish such lands as are within the jurisdiction, but so that such lands shall contribute thereto in proportion to the benefit received as compared with the lands of the other parishes, which tax shall be denominated the general sewers tax, and be recoverable by distress and sale. Their conduct is under the control of the court of Queen's Bench, which will prevent or punish any illegal or tyrannical proceedings. Before dismissing the subject, it may be noted that Romsey Marsh, above mentioned, is in the county of Kent, forming a tract containing 24,000 acres, and is governed by certain ancient and equitable laws of sewers composed by Henry de Bathe, a venerable judge in the reign of King Henry III., from which laws all commissioners of sewers in England may receive light and direction.

COURT OF SHEPWAY is a court held before the lordwarden of the Cinque Ports. A writ of error lies from the mayor and jursts of each port to the lord-warden in his court of Shepway, and from thence to the Queen's Bench.

COURT, SHERIFFS', or SHERIFFS' TOURN, or rotation, is a court of record held twice in every year, within a month after Easter or Michaelmas, before the sheriff, in different parts of the county; being, indeed, only the turn of the sheriff to keep a court leet in each omy the turn of the sherin to keep a court leet in each respective hundred; this, therefore, is the great court leet of the county, as the County Court is the court baron; for out of this, for the case of the sheriff, was taken the court leet, or view of frumkplede, which see.

COURTS, BOROUGH, were originally founded from the

favour of the crown to particular districts, for the convenience of the inhabitants, that they might prosecute their suits, and receive justice at home. The courts at Westminster have, for the most part, a concurrent jurisdiction with them, or else a superintendency over them. Their proceedings ought to be according to the course of the common law, unless otherwise ordered by parliament. By the Municipal Act, 5 & 6 Will. IV. c. 76, the recorder is to be the judge in any court of record for civil actions in the boroughs to which the act extends, if such court be not regulated by the provisions of any local act; but he may appoint a deputy. visions of any local act; but he may appoint a deputy. From these courts, where they are courts of record, a writ of error lies in general to the court of Queen's Bench. A detailed statement as to all the borough courts, county courts, courts of requests, and other local courts throughout the kingdom (se they existed previously to the 9 & 10 Vict. a. 98), showing the extent of their jurisdiction, the authority under which hav were hald and their form of processes. they were held, and their form of process, &c., will be found in the fourth Report of the Common Law Com-missioners, Appendix, Part II. No. 5. COUNTS OF CHANCELLORS OF THE UNIVERSITIES.

(See Universities.)
Courts, County.—The necessity being felt of establishing throughout the whole kingdom some satisfactory

and uniform plan of proceeding for recovery of all debts and demands below a certain amount, it was conceived that new inferior courts, with improved machinery and that new inferior courts, with improved machinery and an ample jurisdiction, might advantageously be created under the name of County Courts, which should form, as it were, a branch of that ancient and well-known institution. This design was carried out by the statute 9 & 10. Vict. c. 95. By the effect of this act, and of orders of council subsequently made thereon, pursuant to its provisions, the courts of request, which this court was intended to supersede, have in general been abolished. The act provides, that for all purposes, except those within the jurisdiction of the new courts to be holden thereunder, the county courts shall be holden holden thereunder, the county courts shall be holden as before. By the act referred to and subsequent etatutes, the jurisdiction of the county courts extends over England, except the city of London, and has been from time to time materially enlarged. It includes all pless of personal actions where the debt or damage claimed is not more than £50, whether on balance of account or otherwise, or when reduced by set-off under that sum, with the exception, however, of actions of ejectment, or in which the title to any incorporeal bereditament, or to any toll, fair, market, or franchise shall be in question, or in which the validity of any devise, bequest, or limitation under will or settlement may be disputed, except as hereinafter mentioned; or for any malicious prosecution, libel, slander, seduction, or breach of promise of marriage. It also extends to the recovery of any demand not exceeding £50, which is the whole or part of the unliquidated balance of a partnership account, or claimed by way of distributive share under an intestacy, or as legacy under a will. It has concurrent power with the superior courts to give summary judgment in actions upon bills of exchange where the claim does not exceed £50. It has power to proceed in cases of replevin; and the proviso which deprived it of entertaining cases of ejectment was modified in certain cases; but now by 19 & 20 Vict. c. 108, sec. 50, lundlords are enabled, after the expiration of the tenancy, to recover posses-sion of houses, lands, or other corporeal hereditaments, where neither the rent nor the value of the premises shall have exceeded £50 a year, and no fine or pre-mium shall have been paid; and by sec. 51 a claim for rent or mesne profits, or both, may be added; and by sec. 52 a similar jurisdiction is given in cases where half a year's rent is in arrear, and no sufficient distress can be had. The crown may sue in the court for custons duties or penalties not exceeding £100; and an action may be brought therein against custom-house officers for illegal seizure, where the damages claimed do not exceed £50. Parties may, by consent, confer a jurisdiction on the court in any action and for any amount, except in cases of criminal conversation; the right of action for which has, however, in all cases been abolished. It may in certain cases detain foreign ships for damage done in any part of the world to any pro-perty of her Majesty or any of her subjects, until satisfaction is made, or security is given to abide the event of a legal proceeding in respect of it. In the sourt may be recovered the costs of proceeding under the Nuisances' Removal Act, 1855. It has an appellate jurisdiction in cases of awards of surveyors in the ignification in cases or awards or surveyors in the metropolitan district, under the Metropolitan Building Act, 1855, where the matter does not involve the payment of more than £30. It may give relief and make orders in relation to charitable trusts, where the income of a charity does not exceed £30; and entertain (under certain conditions) an appeal against the commissioners in assessing the succession duties, if the sum in dispute does not exceed £50, or the appellant contends that it should be reduced by a sum not exceeding tends that it should be reduced by a sum act exceeding £30. The judges sitting at places more than twenty miles from the General Post-office are appointed commissioners to act under the powers of the Joint-Stock Companies Winding-up Amendment Act, 1849, which is, however, except as to cases of banking and insurance companies, repealed; and to take evidence in winding-up cases, under the Joint-Stock Companies Act, 1856. The court has a jurisdiction in certain cases in hardranter (see BANKBURT); and the content. case in bankruptcy (see Bankrupt); and the conten-tious jurisdiction of the Court of Probate (subject to certain conditions) is extended to it, with power to terrolks a probate or grant of administration in cases

where the personal estate is under the value of £200, and the real estate is under the value of £300. Under and the real estate is under the value of ENO. Under the Copyright of Designs Act, 1852, the proprietes may take proceedings in the court of the district within which any piracy has been committed, for the recovery of damages sustained by reason of the piracy. The judge of a county court may issue his warrant for the supprehension of absconding debtors, sworn to be the debted £20 or upwards (see Anner); and may perform all such duties relating to causes or matters demending in channer, or any indee thereof, or before of m all such under relating to causes or matters depending in chancery, or any judge thereof, or before the chuncellor in the exercise of any authority belonging to him necessary or proper to be done in his district, as the chancellor from time to time by a general order may direct. It will be thus seen that the constitution of these courts has been a great boon to the country, by enabling suitors at a comparatively small expense to by enabling suitors at a comparatively small expense to obtain justice, in a great number of instances, without running the risk of incurring the loss, delay, and yexation of having to resort to the superior courts, which frequently operated as a denial of justice altograther; and there is little doubt but that in process of time, by the gradual enlargement of their jurisdiction, these tribunals will become local justice-seats for the trans-action of all legal business, except that of the superior class, for the determination of which the highest legal acumen may be required.

COURTS OF THE DUCKY OF LANCASTER. (See PALA-

TINE COURTS.)

COURTS OF DURHAM. (See PALATINE COURTS.) COURTS, FOREST .- These have fallen into abs desuctude, although certain branches are courts of record. They consist of the courts of attachment, of regard, of sweinmote, and of justice-seat. As the constitution of these courts is a subject more for the antiquary than the general reader, we consider it unnecessary here to enter upon it.

Course or Lorson.—There are several courts having jurisdiction within the city; but most of them entersian matters peculiar to the government and constitution of the city, as regulated by custom. The principal are the Hustings, which is the ancient county court of London, and held before the lord-mayor, recorder, and sheriffs, and is the principal court of the city. but no actions can be brought in it they are city; but no actions can be brought in it that are merely personal. To this court a writ of error lies from the sheriff's court, and from thence to justices appointed by a commission from the crown (who used to sit in the church of St. Martin's-le-Grand), and from them to the House of Lords .- Lord Mayor's is a court of record held before the mayor and alderman for all actions arising within the liberties of London, in which the recorder is judge, but the mayor and aldermen may join with him when they please. So in this court, all matters of equity within London may be determined upon till and answer, upon which the recorder is also judge. It takes cognizance of appeals from the inferior courts of the city and foreign attachments; as to which, see ATTACHMENT. Since writing that article, the court of Queen's Bench has decided that the court has no jurisdiction unless the garnishes has a residence or carries on business in the city.—Orphans. The mayor and aldermen, in their Court of Orphans, are entitled, according to the custom of London, to the custody of the person, lands, and chattels of every infant wh parent is free of and dies within the city, which custom asts, in the case of males, till twenty-one; of females, till eighteen or marriage. It is said, however, to be fallen into disuse.—Sheriffs'. This is held before their steward or judge, and has cognizance of all pleas of personal actions to any amount, and in which, where the debt or damages claimed shall not exceed £50, a summary mode of proceeding has been recently estab-lished, similar in general to that provided for the new county courts.—See The London (City) Small Debt Extension Act, 1852. COURTS OF LORD HIGH STEWARD. (See STEWARD.)

COURTS OF LORD HIGH STEWARD. (See STEWARD.)
COURTS MARTIAL.—These courts are established by
virtue of an annual act of parliament called the Mutiny
Act. (See ARTICLES OF VAR; INQUIEX, COURT OR.)
COURTS, NISI PRIVE.—These are composed of two,or
more commissioners, called judges of assire and sist
priss, empowered to try all questions of fact issuing
out of the courts at Westminster that are then ripe for
trial by jury; the original of which name is this; all

causes commenced in the courts of Westminster Hall are, by the course of the courts, appointed to be tried on a day fixed in some Easter or Michaelmas term, by a justy returned from the county wherein the cause of action arises, or in which the verue is laid; but with this provise, "nisi prina" justiciaris ad assias capisades venerint; that is, unless, before the day prefixed, the judges of assize come into the county in question (which they always do in the vacation preceding each Michaelmas term) and there try the cause Manior they aways do in the receipt processing of the Master and Michaelmat term), and there try the cause; and then, upon return of the verdict given by the jury to the court above, the judges there give judgment for the pairty for whom the verdict is found; there being, however, as to London and Middlesex, this exception,—

\*\*The Tankad of their being comprised within any circulation. that instead of their being comprised within any circuit, courts of Nies Prine are held there for the same purpose in and after every term before the chief or other judge of the superior courts at what are called the London and Westminster sittings.

COURTS, PALATINE.—These are of a limited local jurisdiction, and have at the same time an exclusive segnisance of pleas in matters both of law and equity, and appertain to the counties palatine of Lancaster and Durham, and are the palatine courts of Common Pleas and of Chancery, and they are courts of record.

Course or Request on Conscience were established in various parts of the kingdom for the recovery of small debts and demands; but they were superseded by the establishment of the new county

COURTS, STANKARY, in Devoushire and Cornwall, are They are courts of record, and held before the lordwarden and his substitutes. All tinners and labourers in and about the stannaries, during the time of their ma and about the stannaries, during the time of their working therein bond fide, are privileged from suits of other courts, and to be only impleaded in the Stannary courts in all matters arising within the stannaries, excepting pleas of land, life, and member. But if a cause of action between tinner and tinner arise out of the stannaries. the stannaries, it may be brought elsewhere, if the plaintiff will (2 Inst. 231, Com. Dig. Courts, 1.1); and panners win (2 Inst. 231, Com. Dig. Courts, I.1); and even if it arise within the stannaries, the plaintiff has the option of bringing it either in the Stannary Court or in the County Court.—(See Newton v. Nancarrow, 15 Q.B. 144.) No writ of error lies from hence to any court in Westminster Hall, but an appeal lies from the plantagement of the load readen, and the contract the vice-warden to the lord-warden, and thence to the privy council of the prince of Wales as duke of Corn-wall, when he has had livery of investiture of the same: and from thence the appeal lies to the king or queen in the last resort. — (See 6 & 7 Will. IV. c. 106, as to workers in lead, copper, &c.)
COURTS, UNIVERSITY (the Chancellor's Courts).-

two universities of England (Oxford and Cambridge) enjoy the sole jurisdiction, in exclusion of the queen's courts, over all civil actions and suits whatsoever, when a acholar or privileged person is one of the par-ties, except in such cases where the right of freehold ties, except in such cases where the right of rection is concerned, provided the defendant is resident there, and provided, in the case of Cambridge, the cause of cambridge or its adults. And these, by the university charter, they are at liberty to try and determine either according to local customs, at their discretion; which has generally local outloms, at their discretion; which has generally led them to carry on their process in a course much conformed to the civil law. This privilege, so far as a relates to civil causes, is exercised in the Chancellor's Court, the judge of which is the vice-chancellor, his disputy or assessor. From his sentence an appeal lies to delegates appointed by the congregation; from the other delegates of the House of Convocation; and if they all three concur in the same sentence, it is similarly at least by the statutes of the university, according inal, at least by the statutes of the university, according to the rule of the civil law. But if there be any discordsince or variation in any of the three sentenges, an appeal lies in the last resort to judges' delegates, appapea lies in the last resort to judges' delegates, appointed by the crown under the great seal in chancery. In original offences, the lord high steward has cognismos of all indictments of treasons, insurrections, stance, and may hear, which shall be found against elemies, and may hear, which shall be found against establish the most blesged word of God and his consciously for the time being; but, when his office is called forth into action, he must be themselves atill more distinctly to mutually support

approved by the lord high chancellor of Bagland, and a special commission is given to him and others to try the indictment then depending, according to the isaw of the land and the privileges of the university. The party charged has no right to have the indictment removed, and the vice-chancellor only can claim cognizance of it, and, when allowed by the judges of assize, it comes to be tried in the High Stewards court. The indictment must first be found by a grand jury, and then the cognizance claimed. When the cognizance is accultoned in the light of the commission of the commission of the commission of the commission is accultant.

court. The indictment must first be found by a grand jury, and then the cognizance claimed. When the cognizance is so allowed, if the offence be a misdemeanour only, it is tried in the Chancellor's Court by the ordinary judge.

COURTS, VICE-CHANCELLORS'.—These are branches of the court of Chancery, and the judges sit (like the master of the rolls) separately from the lord chancellor, and are virtually his assistants. Except in a very few instances, but without an appellate jurisdiction, they possess and exercise the same judicial powers as the lord chancellor. An appeal lies from the decision of the judge to the lord chancellor to the lords justices, and from them to the House or to the lords justices, and from them to the House of Lords.

COURTESY TITLES. (See TITLES.)

COVENANT, kuv'-e-nant, in Theol., is used in a double ignification, the one of which is commonly called the Scriptural, the other the systematic or popular use of the term. In the former sense we find the word repeatedly used in Scripture to denote an arrangement, disposition, or institution, according to which the divine favour is dispensed to those with whom it is made. It is not properly a contract or bargain, which made. It is not properly a contract or bargain, which requires that contracting parties be on an equal footing, and that each has the power of accepting or rejecting the proposals of the other; but it is an appointment or institution by a party infinitely exalted above the other, promising to confer or grant certain blessings in a particular way. God's covenant with man signifies his solemn promise or engagement to or not to do a certain thing. Thus, in his covenant with Noah, he engaged that the waters of the deluge should not again cover the earth. The two greats should not again cover the earth. The two great covenants mentioned in Scripture are what are called the Old and New, or the first and the second; the former of which was that made by God with the children of Israel, when he took them to be a peculiar people unto himself, and is also called the Mossic or Sinai covenant, because it was given to Moses on Mount Sinai. The second, of New Covenant, is that which was instituted by Jesus Christ, and ratified by the shedding of his blood, being the gracious charter or instrument by which God has revealed it to be his pleasure to dispense the sovereign blessings of his mercy to all who will accept of them. As used in a systematic sense, divines speak of two covenants, that of works and that of grace. The former is that which was made with Adam on his creation, in virtue of which be was constituted the federal head of the human race, and his acts became binding on his posterity. covenant of grace is a compact or agreement between God and believers, in which God promises to give them all the blessings of salvation through and for the sake of Jesus Christ; and they on their part voluntarily engage to give themselves to God with a sincero faith. Some divines speak of a third covenant, which they Some divines speak of a third covenant, was ended to call the covenant of redemption, or the engagement entered into between the Father and the Son, by which the Father constituted the Son the representative and Redeemer of the human race, and the Son undertook their redemption.

COVENANT, in the Ecol, Hist. of Scotland, is applied to certain contracts or conventions entered into by the leading Protestants of that country, binding themthe leading Protestants of that country, binding themselves to maintain their religious principles against innovation and opposition. The First Covenant was signed at Edinburgh on the 3rd of Docember, 1557, by the earls of Argyle, Glencairn, and Morton, the lord of Lorn, John Erskine of Dun, and a great number of other distinguished persons. They engaged, with God's grace, to apply their whole power, substance, and very lives, to maintain, act forward, and establish the most bleaged word of God and his congregation. On the 31st of May 1550 arother covenant.

and defend each other against all attacks upon them for the sake of religion. This is known as the Second Covenant, The First National Covenant of Sectland was occasioned by a fear that the young king was too much under the influence of Catholic advisers, and was much under the influence of Catholic advisers, and was signed by James VI., on January 28, 1581, and in it he solemnly abjured the errors of popery. It was afterwards subscribed by the greater part of the no-bility and gentry throughout the kingdom. Attempts on the part of Lennox, Arran, and others of the no-bility, to re-establish bishops roused the country to a renewal of the covenant in 1590; and as the king continued to give indications of a leaning towards prelacy, it was again renewed in 1596. The attempts made by James, after his accession to the English throne, to introduce the episcopal service and forms of worship roused the indignation of the people of Scotland, and the National Covenant was again renewed in 1638. The covenant, as then drawn up, consisted of three parts:—
1. The old covenant of 1581, exactly as at first prepared; 2. the acts of parliament condemning popery and confirming and ratifying the acts of the General Assembly; and, 3. the special application of the whole to present circumstances. The subscribers engaged by oath to maintain religion in the same state in which it existed in 1580, and to reject all innovatious introduced since that time. The subscribing began in the Greyfriars church and churchyard, in Edinburgh, on the 28th of February, and afterwards copies of it were circulated throughout the kingdom, and signed by enremarked throughout the kingdom, and signed by meanly all of competent spe and chiracter. It is worthy of remark that the signing was everywhere regarded set a most sacred act, and some persons of note who offered their subscriptions were refused, because it was supposed that they were influenced more by the fear of men than love to the cause. Those who subscribed were known by the name of Covenanters. Some other this time Charles I some the product of the contraction of the contra after this time Charles I. came to a rupture with the English parliament, and the latter, in order to obtain the assistance of the Scotch, made evertures for a union, which led to the Solemn League and Covenant.
This document was drawn up and ratified by the Convention of Estates in Scotland in 1643, and afterwards accepted and subscribed by the English parliament and Westminster assembly of divines. It bound the united kingdoms to endeavour the preservation of the reformed religion in the Church of Scotland, in doctrine, worship, discipline, and government, and the extin-pation of popery and prelacy and the reformation of religion in the three kingdoms. When Charles II. came over to Scotland, in 1650, he signed both this and the National Covenant before landing, and again on his coronation at Scone, in 1631. On his restoration to the English throne, however, he soon manifested his repugnance to these documents, and they were rescinded by act of parliament in 1661, and burned by the common bangman. After this time, the Covenanters, or those who maintained their adherence to the principles of the National Covenant, in Scotland, were subjected to great persecutions, which served only to confirm them in their principles. Those who refused to abjure the Covenant were regarded as rebels, and were obliged to betake themselves to the desert moors and mountains of their native country, where they were hunted like wild beasts till the establishment of freedom of conscience by the revolution of 1688. sufferings, the courage, and the piety of the Cove-nanters have to this time endeared them to the Scottish mind. Long after the return of more peaceful times, their memory was cherished by the religious with the

faces of the bastion and its salient angle are to the re-entering and estient places of arms. It vered way is an important part of the works of fortress that are constructed beyond the main at a tack on it is attended with difficulty and to the attacking party are easily shot down by a stationed therein as they ascend the glacis; affords the besieged the means of forming with exposure to the fire of the enemy, and deploying for thence in line when making a sortie on the besies from the fortress.

Cow, kow, the female of the bovine species.

Cow, kow, the female of the bovine species.

Cow Bunting (Molathrus pecoris), a passerine
bird of North America. Its most remarkable that
is that, like the cuckoo, it deposits its eggs in strange
nests. It is about the size of the thrush, and is chiefly
black, with a violet tinge. The tail is slightly forked;
legs and claws glossy black, and very muscular.

CowL, or Coul, kowl (Lat. cucullus), is a sort of
hood worn by the Bernardines and Benedictines. They
are of two kinds—the one white and wary large, worn

are of two kinds,—the one white and very large, worn on ceremonial occasions and when assisting at the office; the other black, and worn on ordinary occa-

office; the other Disca, and worn on ormany reservious, in the streets, &c.
Cow-rox. (See Vaccination.)
Cowries, kow-rees, a gen. of univalve shells, remarkable for the brilliancy of their colours, and the high polish of which they are susceptible. They abound bether the all and new world but their greatest the both in the old and new world, but their greatest development, both in point of size and number of species, takes place in warm climates. In the East Indies and many parts of Africa, cowries are used as current coin by the natives.

COYPU, koi'-pu (Myopotarinus Copyus), a redent animal, smaller than the beaver, but of many similar animal, smaller than the beaver, but of many similar characteristics. Its habits are aquatic; it burrows near the margin of rivers, and swims with the greatest case. Its hind feet are webbed; its head large and copressed; cars small and rounded; muzzle long and pointed, and ornamented with bristle-like whiskers, its tail is round, instead of being flattened like the beaver's. It is peculiar to South America, and its skin forms the stanks of a convidently to the forms the staple of a considerable trade.

URAN, krib (Sax. crabba).—This name is popularly applied to the whole of the crustaceaus belonging to the ord. Decapota. This order is divided into three sub-orders,—the Macrara, or lang-tailed crustacea, to which the lobster and crayfish belong; the Anomura, which appears to hold an intermediate position between the former and the third sub-order, the Brachyura. To the latter the common orab belongs. This animal is thus characterized :- The abdomen is always converted into a short jointed tail, quite destitute of terminal appendages, and bent round so as to fold closely under the breast. The cephalo-thorax is usually of a more or less rounded form, generally

broader than long, and often produced in front into a point. The upper surface is entirely covered by a single plate (the cara-pace, or back). The eyes and the inner antenue, the latter of which are very short, can be entirely con-cealed within small cavities of the forehead. The outer antenne are never of any



ORAB.

mind. Long after the return of more peaceful times, their memory was cherished by the religious with the deepest reverence. The sect of the Cameronians still tenniated only by single claws. The feet of the crab, regard themselves as representatives of the old Covenanters. (See Cameronians made by deed, and is in effect a contract entered into by the covenantor with the covenantee. The subject of contracts in general will be found in its proper place, and under the word DEED will be treated the nature and requisites of the instrument by which the covenant is created.

Covenan Way, kur'-erd, a passage round any fortification constructed on the outer edge of the ditch opposite the rampart, and protected from the enemy's fire by the glacis. (See Glacis.) The broad open spaces opposite the angles foreact by the flanks and great length, and the anterior feet are always converted

—baited with meat or some saimal garbage, into which the animal is easily snabled to crawl, but out of which the intellects of the grab are too dull to devise a means of escape. The small edible erab (Camer means) is of secape. The small edible crab (Cancer manas) is also very common on all parts of our coast, but not so much valued as the former. A very curious species is the harmit-crab; belonging to the sub-ord. Anomera. This creature possessing a very soft abdomen, it would be very likely to be seized by some predactions fish, if it were exposed. To prevent this, the hermit-crab seeks for some empty tenement, wherein it may take up its abode. The habitation usually chosen is the shall of some univalve mollusk. Into this spiral home, the hermit-crab is coiled, and retains himself in this position by means of a sucker at the extremity of this position by means of a sucker at the extremity of this tail, assisted by two or three radimentary feet, which are developed upon the abdominal sac; and so firmly does he adhere to his castle, that he will allow himself to be torn to pieces rather than let go his hold. himself to be four to pieces rather than let go his hold.

By protrading his body with its three pairs of legs

from the orifice of the shell, the little hermit is

exactled to walk with ease upon the sandy beach in

exactled to disprey; but the moment danger threatens

him he disprey again into his cell the orifice of him, he disappears again into his cell, the orifice of which is then occupied by one of his claws, which is always larger than the other. As the crab does not possess the same power of adding to the size of the domicile that was enjoyed by the original tenant, he is compelled from time to time to change his residence for one a little larger, and often appears almost as difficult to please as a human householder in the same predicament. Often they may be seen crawling about amongst the empty shells just thrown upon the beach. trying one after another, until they meet with one uniting all the conditions requisite for crustacean comfort; but, until this great object of their search is obtained, always returning to their old house after each unsuccessful trial." Dallas, from whom the above happy description is quoted, says, moreover, that "when two of them happen simultaneously to east a longing eye upon some particular suitable residence, they often engage in a flerce battle for the possession of the coveted object, which the victor always carries of in triumph."



SRA-TALR.

(Gr.), in be-CRAMBE, kramb Bot., a gen, of plants be-longing to the nat. ord. Crucifera. The species C. maritima, or sea-kale, grows wild on the sandy sea-shores of Bri-tain. About the middle of the last century it was first introduced into gardens, and grown like asparagus, under a cover-ing which shielded it from the action of light. In the wild state the plant is very acrid; but, when blanched by the art of the gardener, the stem and leaf-stalks form a delicious vegetable, which is preferred by

CRAFF, bramp (Sax. kramma, Du. kramp), in Med., an involuntary and painful contraction of one or ral of the voluntary muscles connected with a certain part or organ; as of the leg, foot, or arm. It na often the result of cold, is sometimes occasioned by greatly disordered state of the bowels, and frequently openes on without any obvious cause. In general, crains is readily removed by a forcible exertion of the anti-gonist muscles, so as to overcome the spasmodic contraction or by friction and warmth. Cramp of the stomach is to be combated by the external and internal nae of stimulants, and by opium, ether, and other antispasmodics. (See Syrasm.)

Only the best of the cramp a machine read on

the weight is raised to the required height, and, by means of the revolving shaft, deposited anywhezo within the reach of the jib.

Chark, Common (Grus cineres). — This bird is found in considerable flocks in the northern pairs of

found in considerable nous in the nothern pairs of Europe. It measures about five feet in length; general plumage sah-coloured, but forehead black; sides of the head and hind part of the neck white. On the unper part of the neck there is a bare sah-coloured space of about two inches, and above this the skin is naked and red, with a few coloured hairs. The pinion of each wing is furnished with an elegant tuft of curied feathers. The bill is long, straight, and compressed, obtuse to-wards the end, and with the lateral base deeply chan-



nelled. Its nest is usually constructed in some swampy nelical. Its nest is usually constructed in some swampy tract or insulated ruin. It lays two eggs, of a pale dull-greenish colour, blotched with brown. Its food is frogs, snails, grain, vegetables, &c. When a flock congregated on a marsh compose themselves for slumber, some few are navariably wide awake, and stand perched on one leg, looking out for danger. Kolben, with an audseity that should direct particular acrutiny to suything class he may aver, says that these sentinel grames thing else he may aver, says that these sentinel cranes held in the tucked-away foot a large stone, so that should it fall askeep, the falling of the stone would rouse the sleepers. The crane is a bird delighting in rouse the sleepers. The crane is a bird delighting in the wastes that lie on the edges of marshes, or that are subject to periodical overflowings by rivers. Sugh pasturage at one time abounded in England, and then the crane was well known amougst us, and its breeding encouraged, and a penalty enforced for disturbing its encouraged, and a penatry entorest for unsurroung tea-eggs. So long ago, however, as Pennant's time, the bird was regarded as having ceased to exist among us. In proof of the great favour the crane attained in the eyes of gourmands, Pegge relates, in his "Form of Curry," that "William the Conqueror was so exact, Curry," that "William the Conqueror was so exact, so nice and curious in his repust, that when his prime favourite, William Fitz-Osborne, who was daplier or steward of his household, had the charge of the curey, served him with the fiesh of a crane scarcely half rousted, the king was so highly exasperated that he lifted up his fist, and would have struck him, had not Endo, who was appointed steward immediately, after, warded off the blow." The Demoiselle or Numidean canno (Arithmonaliza giran) is a mixing of Afficia. This Carrac (See Oxycoccus.)

Carrac (See Oxycoccus

## Cranicles

#### Crannoges

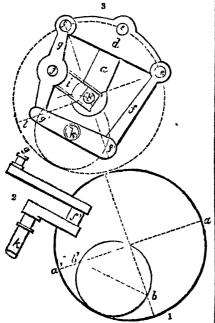
The crowned crans (drdes papersors) is somewhat smaller than the last-mentioned, and is chiefly known by the possession of a close turt of valvely black feathers covering the forepart of the bend, while behind them rises a semarkable overt of fine feathers twisted spirally,

rises a semarkable operator fine feathers twisted suirally, and fringed along its edges with a series of black pointed heirs. Its cheeks and temples are entirely naked, and covered with a bright rocy red.

CLANICLOSY. (See PREENCLOSY.)

CRANTUM. (See BRAIN.)

CRANTUM. (See B or now serva. A new nor rectaines motion of the piston of an ordinary steam-engine by means of a cumecting-rod gives a circular motion to the crank. There are two points in the motion of a crank where the connecting-rod has no power; viz., when the arm of



the grank is parallel with the connecting-rod above or below the axis. In order to carry the crank over these points, the fly-wheel is used. By its impetus the circular motion is kept stondy and regular. The machinery or apparatus termed a connecting-crank, for connecting two shafts so as to cause them to revolve at different velocities, may be illustrated somewhat in the following manner:—We will suppose that the letters ab, in the accompanying figure-present the pitch-line of two wheels, the wheel a being twice the diameter of the wheel b; then for every revolutions of the wheel a, the wheel b will make two revolutions, and if a tracing-point be attached at b', it will describe the straight line a a' upon the face of the larger wheel, and if another tracing-point be attached at the opposite side of the small wheel b, such points will describe straight lines at right angles to one another during the revolution of such wheels. In fig. 1 is shown an elevation of the strangement of levers for connecting two shafts together, so that they may revolve at different velocities. Fig. 2 is a plan of one of the shate, which is provided with a crank forning a portion of the apparatus. In fig. 3, a is a crank fixed upon the end of a shaft (b), supported by suitable bearings; c is the crank-yin which supports the triangular arm d, the grank is parallel with the connecting-rod above or

Cranadoges

through each end of which there are pins (a, a), is the same plane with the aforestid shaft; these pins support two connecting-rode, f, g, the lewer and, of the connecting-rode, f, g, the lewer and, of the connecting-rode of the connecting-rod g being attached to the crank-pin g', of the plan; b is a pin fixed into the end of the sinate, which carries due end of the connecting-link i, the opposite and being attached to the centre or middle of the connecting-link i, the opposite and being attached to the centre or middle of the connecting-link i, the roll pin jr jr in the arm of the shaft, which is to receive motion from the shaft b, or were verifd; consequently, if g be double the length of the connecting-link i, the point g will describe a straight line [I I], and if we suppose g to be attached at its lower end to the crank-pin g', and also the rod f to the orank-pin f', and that the axes b and k revolve in suitable bearings, k will make two revolutions while b makes one revolution.

Channours, kride-nough', a term applied to the lake-

CHANNOGES, krun-ngage', a term applied to the lake-dwellings and fortified islands of the ancient Celts in dweilings and fortified islands of the americal certs in Ireland, Scotland, and other countries. Although dwellings of this kind on Lake Prasias, in Macedonia, were described by Herodotas (book v. chap. 18), the subject did not attract much attention until vestiges of smiler erections were found in other parts of Europe, in 1839, the first orannoge was discovered by Mr. W.R. Wilde, one of the secretaries of the Royal Frish. Academy. After draining the small lake of Lagore, in Academy. After draining the small lake of Lagore, in the county of Meath, a circular mound, which had been an island, was discovered. It was thickly stream with bones, and as these were being removed for manure, the island was found to be of artificial construction. Its diameter was about 140 feet, and it was formed by upright oak piles see an feet long, mortised into oak planks laid upon the sand and mark at the bottom of the water. The piles were united at the top by cross beams, and the space inclosed was divided into compartments filled with bones and black peaty earth. A second tier of piles was also observed raining from the lower tier. The bones were found to be those of horses, assen, oxen, sheep, dogs, &c.; and amounts lower tier. The bones were found to be those of horses, asses, oxon, sheep, dogs, &c.; and amongst them were a large number of swords, knives, spears, cooking-nieusils, and ornaments. Mr. Wilde's discovery was followed by the discovery of several other crannoges in Ireland, some of them perfectly arkifetial, and others partly natural and partly artificial. In nearly all cases, the piles are made of oak, mostly fire young trose from four to nine more above of Theorem. young trees, from four to nine mohes broad. In some crannoges, a causeway leads from the island to the mainland; but they were generally reached by cadors, remuants of which have been found in nearly all. Crannoges are mentioned in the annals of Ireland as sarly noges are mentioned in the annas of treiann as early as the 8th century, and continued to make a figure in history till the 17th century. In the winter of 1883, on account of the continued drought, the Lake of Zurich was unusually low, and the inhabitants of the village of Meilen endeavoured to regain a piece of land from the lake. During the process, the remains of rows of deeply-driven piles were discovered. About the process of the found is the process of the process. them were found a large quantity of weapons, tools, and utenuls of very primitive form and make. On and utenuls of very primitive form and make. On close examination, it was found that the piles had supported a platform, and that the whole building reported a piazione, and that the waste patients re-sembled the crannoges of Ireland. Since that time, thirty to forty crannoges have been found in the upper and lower lakes of Constance, thirty in the Lake of Geneva, and twenty in the Lake of Neufohital. The lake-dwellings of switzerland resemble those described by Herodots more closely than the Celtre crannages.
There is no mention of them in history, but their remains prove that they are ancient. Since 1857, the traces of crannages have been found in nearly every part of Scotland; and remains of lake-dwellings have part of Scottand; and remains of isse-tweinings lawe been discovered in Savoy, Upper Italy, Hanover, Prussis, and Denmark. Traces of a not very certain kind of crunnoge were observed in draining a mere at Wretham Hall, near Thetford, in Norfolk. A learned writer in the Gentleman's Magazine, availing limself of the valuable work on lake-dwellings by the accomplished Swiss archeologist, Dr. Keller, says to "The number of these pile-built settlements discovered, and the attenute examination they have undergone, remove all doubts as to the process of construction. A spot with a sunny aspect seems to have been chosen in some little bay that would in a degree shelter it from the full force of the waves ; and any

those but one with a rocky bottom acreed the purpose. The sate being desided on the marcet trees in the dispent forest were felled for rills. There seems to save been no partiality for any puripolar, word one, she fir, were indispensably taken, even cherry and price stame? It hand; and it is our loss to find in the lasks of Palition that the fir-free has lasted better than be cut. Then exist she process of pointing the piles, which must have been a troublesome business in the laye of slowe axes. It is as yet a matter of regret has so have no systeme as to the way in which the slick disting was performed. We know for certain, exists, that the piles were driven, at a distance of rest case to three hundred feet from the shore, at a highly of six or seven feet, gradually advancing into lease water. They were extended parallel with the have defined in the lake of Geneva, the piles extend twelve hundred feet in life it, by one hundred and streen cabins and the same of six of seven the lates of Geneva, the piles extend twelve hundred feet in life it, by one hundred and twenty in width, giving a manipulate that some three hundred and esteen cabins are also have a population of twelve similar and sixty-four. There is good authority for appearing that the cabins erected upon the pile-superied minifurn were constructed of wattled-work shore but one with a rocky bottom served the purpor sponing that the cabins erected upon the pile-sup-sponing that the cabins erected upon the pile-sup-sponing that the cabins erected of wattled-work stored with clay. The lake-dwelling system must we arisen in the stone age, and endured through the case age, till at least the introduction of iron, and an away in Helvetia. This fact is supported The discovery of several iron swords, about three be long, with blades somewhat over two inches in dib, and iron scabbards, by Colonel Schwab, in the see of Bienne and Neuchatel, which are indisputably of the same type as those recognized as Romano-British and Gallo-Roman—that is, of the late Roman period, when the influence of an alien taste becomes visible in Roman manufactures. How much is known of the every-day life of these ancient dwellers on the Becent discoveries have proved past doubt that the people of the stone age had reached a degree of enture which is not a little astonishing. It was to have been expected that these people should lay in abovered upon them; such as nuts, acorns, beech-man. A surprising fact is the one that they also possessed stores of corn. Professor Heer has found dant examples of a coarse bread, savouring rather mixed corn than mest. It was probably baked on themse, and covered with hot embers. Professor r also found in the same lake-dwelling carbonized or also found in the same lake-dwelling carbonized mins of apples and pears out into halves and stern, and dried in the sun for winter food. The ban holds in Switzerland to the present day, and dried apple-cuttings are sold by measure in the later under the name of senitze. It is certain that a people that flax and hemp, and were acquainted the senitary of measure in the later. the people and flax and hemp, and were acquainted to the means of manufacturing these into fishing.

The great variety of fish-hooks picked up out the lates shows that they knew how to take advanced the rickes afforded by the lakes upon whose text they fixed. They were fully acquainted with art of pottery. They were herdamen likewise, a tentured by the discovery of the remains of oxen, and goats around their old habitations. Consequently, they must have possessed the means of centuring and storing forage for them in winter, or they must have possessed the means of ing and storing forage for them in winter, or asset have perished in the snows, when the healt with difficulty finds subsistence. At channels itself with difficulty finds subsistence. At these lake dwellings everything in fact tells of the gaint, satelled occupation of a primitive race of farmers, hantsens, and finhermen, who in thus establishing their homes above the floods, either adhered to the traditions of their oriental descent, or sought security from their fees. Whether their cattle were also conveyed to the lake-dwelling, as Herodotus tells us of the Pasonians in Lake Frasias, cannot be ascertained. It would seem difficult to conceive how they could have done so without causeways, and these have not generally bean discovered. Probably they were securely parked in at night on the shore, with strong palience, against affacts of beast of prey. Of course likey must have fallen to any invaders strong enough sy must have fallen to any invaders strong enough compel the retreat of their waters to their lake 586

bousse, which in such case, moreover, could hardly have been protected from flery projectics; and in this way, probably, many perished. The archaelogical world is under great obligations to Dr. Relier for his discoveries connected with lake-dwellings—discoveries which take rank only after those of Pompei and Ber-culaneum. The drawing on Plate LAXVIII is bor-rowed from Keller's work on the lake-dwellings of Switzerland.

CEANTARA, or FIREY CROSS, krim tor a (Gaelle, oreun turigh, the cross of shame), was a military signal employed in the Sectish highlands for collecting the distant and scattered clansmen to the standard of the chief. It was a firebrand, or wooden cross, which, after being dipped in the blood of a goat, was sent by a swift-footed nessenger to the nearest hamlet, where he delivered it without uttering a word but the name of the place of rendezvous. The fleetest runner of the haudet was immediately dispatched with it to the next and so on, till all had received notice. It was understood to denounce destruction by fire and sword against all who refused to obey the summons, and was called the Cross of Shame, because disobedience implied infamy. It was in use among the ancient Scandinavisne from whom the Highlanders appear to have borrowed it. The last time this signal was made use of in the Highlands was in 1745.—Ref. Sir Walter Scott's Lady.

of the Lake, canto iii.

CRAPE, kvaip (Fr. orépe), a light transparent silken fabric, from which the whole of the gloss hus been taken in the mode of dressing the eilk. It is soaked in a solution of gum after it has been woven, and dried, which gives it a peculiar shrivelled appearance.

CRASSULACER, krus-su-lai'-se-e (Lat, crassus, thick, CMASSULACE, Frue-su-(ac-se-e) (LBT, crassus, three, from the thickness of its leaves), in Bot, the House-leek or Stonecrop fam., a nat. ord. of dicotyledonous plants in the sub-class Calgoiftora,—succulent herbe or shrubs with exstipulate leaves. The flowers are perfectly symmetrical, the sepuls, petals, and carpels being equal in number (from three to twenty), and the stanger being also camped to them or twice a ware. mens being also equal to them, or twice as many. The petals and stamens are almost, or quite, hypogynous. The corolla is monopetalous or polypetalous. The fruit is either apocarpous and follicular, or a many-celled capsule, with loculicidal dehiscones. The seeds are small; the embryo is in the axis of fleshy albumen. The Crussilveez are found in very dry situations in all parts of the world; a large number occur at the Cape of Good Hope. Astringent, refrigerant, and acrid properties characterize them, and have given a few some importance as medicinal plants. (See Cory-LEDON (the Navelwort) and SEDUM.)

CRATEGUS, krdl-e'-gus, in Bot., a gen. of plants belonging to the nat. ord. Rosacee. The species C. acyacantha is the Hawthorn, Whitethorn, or May, so well known for the beauty and fragrance of its flowers. went known for the ceasity and regrance of its nowers, and for being the best hedge-plant in Europe. Some varieties of this species are highly ornamental, producing double pink or scarlet blossoms.

CHATER, kraiter (Gr. krater, a cup or how), the mouth or orifice of a volcano, so named from its cap.

month of orthogo of a voicence, so minest around the core of bowl shape. (See Volcano.)

Obanyfish, or Chawfish, krail-fish (Astaeus finestills), a crustaceous animal, differing little in general appearance from the lobster. Species of this generate found in almost all parts of the world. The field is reckoned cooling and nutritious. It lives best in rivers, where it takes up its habitation beneath stones and in holes in the banks, there lying is wait for the larve of insects, decomposing animal substances, and amuli fish.

Small lish.

CRAYON, krail-on (Fr. crayon, a pencil; crais, chalk), the name of a pencil of any kind in France, but applied more particularly in this country to pieces of charcost, and black, white, and red chalk, used for drawing on various kinds of tinted paper, and for sketching cartoous, or the outlines of paintings of considerable size on canvas. The best black crayons are made of a soft black earth found in Italy, and the best white suce of a fine kind of French chalk. Crayons are also made by mixing recent the and minaral colouring metals with wide. mixing ege table and mineral colouring matter with pige-olsy or chalk, and giving consistency and adhesiveness to the mass by the addition of a little milk, gom-water, war, or soap. Drawings in orasyon look soft and rich in colouring, but the outline is generally hasy and ill-

Cream

Credentials

defined. A metal tube slit at both ends, which can be compressed at pleasure by a sliding ring, and is called a pertecrayon, is used to hold the chalk; but cometimes the material is unclosed in a casing of wood, and rembles a lead penal; Softnessin shading is produced by rubbing the chalk-marks gently with a piece of leather or paper, which is rolled tightly together and cut to a blunt noint at each end. cut to a blunt point at each end.

ORRAM, kraem (Fr. areme), the oily or butyraceous substance which collects on the surface of milk. When milk is allowed to stand for some time, it undergoes certain changes; the crem, being lighter, rises to the surface, forming a thin layer, while the milk below less rich by the abstraction of the cream, assumes a vale bluish colour, and consists of curd, the substance from which cheese is made. When cream is kept for some days it becomes thicker, and, if suspended in a bien hag in a cool room, will acquire the consist of carried on, the of cheese. Cream cheese is sometimes made in this periods of time. way. Clotted cream is milk and cream in a coagulated and scur state.

CREAK OF TARTAR, in Chem., bitartrate of potash. (See POTASH, BITARTHATE OF.)

tore RUTASH, BITARTHATE OF:
CERROTE, kre'-å sote (Gr. kreae, ficsh; sozo, I preserve), in Chem., a fluid containing oxygen, hydrogen,
and oat bon, first found by Reichenbach, in the heavy
oil obtained by the distillation of wood-tar. It a preparation is too tedious and troublesome to describe
here. When pure, it is a colouriess oily liquid of high here. When pure, it is a colouriess oily liquid of high refractive power, boiling at 308°. It is not easily kindled, but, when burnt, it gives forth a sooty smoky flame. It has a burning taste, and its odour is peculiar. It is sparingly soluble in water, to which it gives its odour and taste. It is free! soluble in acetic acid, alsohol, ether, heard, and tersulplade of carlton. It coogulates albumen immer powerful antiseptic kno stely, and is the most Meat that has been planged into a solution co ring only I per cent. of this substance becomes dry this substance becomes dry and fired on exposure to the air, and does not become putrid. It is thought by many, from its composition and properties, to be a homologue of phenic acid.

CREATINE, OF KREATINE, kre-a-teen' (from Gr. kreas, flesh), in Chem., a substance having basic properties found in flesh and wrine. Flesh contains but a very small portion of this body. It is prepared by chopping up raw cod, mixing it with an equal weight of water, and expressing the liquid. The liquid is then heated, to coagulate the albumon and baryta; water is added as long as it occasions a precipitate. The filtered liquid as mag as to occasions a precipitate. The interest infinite of nearly pure creatine. It crystalizes in colouriess oblique prisms. It is sparingly soluble in cold water and cold alcohol, and insoluble in other. Although neutral to test-papers, it forms definite compounds with some of the acids. By boiling creatine with bydrochloric acid, a new base, -creatinine, is formed.

Cheartnine, or Kreattnine, kre-it-lin'-cen, in Chem., is formed spontaneously in putrid urine, or by acting on creatine with hydrochloric acid, when hydrochlorate of creatinine is formed, from which the acid may be separated by boiling it with hydrated oxide of lead. It requires twelve parts of cold water for solu-tion, but dissolves more readily in hot water and alcohol. Its solution restores the colour of reddened litmus, and it appears to be somewhat strong in its basic properties, forming crystalline sulphates, hydrochlorates, and numerous double salts.

OBBATION, kre-ni-shun (Lat. creatio), in its strict and primary sense, signifies the bringing into being of something which did not before exist. It is therefore generally applied to the original production of the materials out of which the visible world was composed. There is but one underived and self-existing cause by whose power and agency all things were at first created. In a secondary or subordinate sense, it is used to denote those subsequent operations of the Deity upon matter by which the whole system of nature and all the primitive order of things received their forms, qualities, and laws. In this secondary sense, God is said to have created man out of the dust of the earth. The researches of modern elience have raised many questions as to the accuracy of the account given by Moses, in the beginning of Genesis, of the creation of the world, or, at least, of the commonly received inter-

pretation of it. To enter upon the several points of controversy, and to give the various solutions of them, would he to write a book; and this is the less necessary as, to our mind, no estisfactory solution of the difficulties has yet been arrived at. There is indubitable evidence that the world existed many ages, and underwent various changes, before it received its present races of inhabitants, others of other forms and other properties having lived their ages and become stines. The difficult is to reconcile these facts with what we find recorded in the book of Genesis. The most prehable solution, and even that is not without its difficulties, is, that in Genesis we have an account of two distinct or ations, separated from each other by a very long and undetermined period, the first being of the long and undetermined period, the first being in the beginning, when God created the heavens and the earth; the other, when the work of the days was carried on, the days being understood to mean long periods of time. It is to be borne in mind that the great truth which Moses intended to convey to the children of Israel was, that God was the creator of all things; and that it was necessary for him to do this so as to be understood by them, and to conform his instructions to their preconceived or presectived opinions. Scripture was intended to teach theology, not science,—to reveal what could never have been found out by reason, and to leave to reason its own particular province. If, therefore, by the powers of reason man has come to see greater beauties and a sublimer depth in the works of God than have been revealed in his divine word, it seems very unpeasonable to make use of this as an argument against the truth of revelation. To expect from the Bible a scientific account of the works of creation seems as unre sonable as if we were to expect an accurate knowledge of the anatomy of the human body from a child before he attempted to walk. God has given man instincts before reason; and though reason may teach us that instincts sometimes err, these errors cannot be advanced as an argument against the existence of the instincts, but are to be attributed to the imperfections of our nature. God is the author of nature, as well as of the Bible, and, instead of attempting to set up the one in opposition to the other, we ought to wait with patience till some satisfactory solution of the difficulty arrived at. It was an excellent advice of an eminent divine, to learn to "trust God where we cannot trace Him." It is to be regretted that Christians have frequently been led into the error of attempting to establish the truth of Christianity upon a solution of such difficulties as those that occur in the Mossic account of the creation. If in the prophetic writings lengthof the creation. It in the propagate by the term days, ened periods of time are expressed by the term days, the like interpretation may, without any stretch of the imagination, be given to the days of creation, the works of which, though long after the fact, were as much subject of reveision as the other. Science has already furnished us with several very remarkable proofs of the truthfulness of the Mossic account. The order or the truthuness of the Mossic account. The order of creation, as given by Moses, is exactly that which science tells us had been followed. We are told also, that on the first day, God said, "Let there be light; and there was light;" and afterwards we find that the sun and moon were not created or made to shine till the fourth day. This are presented in market the sun and moon were not created or made to shine till the fourth day. This apparently manifest contradiction has been reconciled by modern science, which proves that light exists independently of the sun, and must itself have been an original and independent creation. CREDENCE, kre'-dens, is a small table near the alter

or communion-table, on which the bread and wine to be used in the celebration of the Lord's Supper are placed previous to consecration. They were common in the early churches. The name is said to be derived from the practice in ancient courts of having a sideboard or credence-table, at which the cupbearers and carvers (credentiarii) were required to taste the wines and meats before being presented to the monarch, in case of poison.

CREDENTIALS, kre-den'-shills, are the instruments or letters which an ambassador or other diplomatic minister receives from his own government, to present to that to which he is sent, and which define his powers and show to what rank of minister he is intended to helong. A sovereign has the right to determine the particular character with which he chooses to invest

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# Credit

his mimster, and if he is received at the foreign court, it must be in the quality attributed to him in his cre-dentials. Hence the ambassador natally communicates their contents before being admitted to his first su-

dience Cambre, kned it, as Fol Ec., is one of those terms which are well understood, but which it is difficult accurately to actine in words. It may be said to be the lend migral wealth of earlied by one midriculal tensorier, the lender being said to give, and the borrower to get or receive freacht. A party who purchases goods on credit meanly sociumes the command of so much of the capital of the seller as these goods represent. Or dut, then, is nothing but a new distribution of the capital or wealth already in existence, and is advantageous in wealth already in existence, and is advantageous in so far as the borrowers can generally employ it to of far as the borrowers can generally employ it to better purpose than the lenders Credits are injurious when they sliew the idle, reckless, or improvident, to squander the means of the frugal and industrious, but, generally speaking, these bear but a small proportion to the other class, where wealth is lent to persons who can ampley it to better purpose than the lenders. The rate of interest or premium paul by the borrower for the use of the capital depends on a variety of circumstances,

use of the capital depends on a variety of circumstances, as the time and manner of its repay ment, its security, the state of the money market, &c. (&c. | INTERENT Custors FONCIER, krai' de fon(g) se a (Fr credit on lands), is an institution in I rance, established by an edict of 28th February, 1802, the object of which is to supply landed proprietors with the means of carrying out improvements by granting them loans of money on the security of their lands, to be repaid by equal instalments, so as to extinguish the debt within a circum period. On this principle certain some less have tain period On this principle certain societies have been formed in France, with the authority of the go verament, subject to certain conditions, and endowed with ceriain privileges Their regultions are precisely defined by law, and they are not allowed to advance to more than half the value of the property pledged or hypothecated

CREDIT INDUSTRIFL, a(h)n door to e el' (1 r , indus trial credit), is the name given to a commercial so ciety recently estal lished at Paris (1853), under the searction of the government, ir the purpose f making advances for a limited period, to persons ugget in nadustrial pursuits, on goods, shares, bills, binds, &c, to the extent of two thinds of their marketable value The habitity of the shareh iders is limited to the amount of their shares. The capital 19 6),000,000 frames, divided into 1.0,000 shares of 500 france each

CREDIT, LETTERS OF (See ETTERS OF CREDIT)
CREDIT MOBILIFE, SOCILTE GENERAL DI, 18 the
name of a society established in I rance in 1802, upon the principle of limited liability, under the sanction of the government The capital was fixed at 0) 000,000 france, divided into shares of 700 france each. The operations of the speciety are directed principally into three fields -(1) To aid the progress of public works, and promote the development of national industry,making railways, managing gas companies and, in tact, becoming a kind of universal trading assection (2) for the buying up of the shares and bonds of ex sating trading societies and companies, for the just we of consolidating them into one common sock, all is for the transaction of general lanking and in kerage operations lhe finds if the carrying out of these diverse operations are,—(1) the capital of the company, and (2) the deposits received from the society by the public

Cagan, kreed (Lat creto, I believe), is a brief summary of the articles of faith. There are various creeds, the chief of which are the Apostles, Athana

carrows, use cause or water are the Apostles, Athana same, and Moene (See these arricles).

CREETER, kreep or ((erthia) — With the exception of the yellow-created wren, the common creeper ((erthia) fathan familiaria) is probably the smallest be ded British bird when fully grown its weight is only five drains. The bird when fully grown its weight is only five drains. bull is hooked, the legs stender, and the toes and class rery long. The nest of the common creeper is built very long in a bole in the hank of a tree, and is formed externally dent in Britass, but, owing to its busiling hibit and gwift inovements, as seldom seen even in localities where tabonds. The wall greeper (Lerthia muraria, Linn) tylidonous plants in the sub class Corollysore, consists a more rare bird in every other part of Europe save ing of small trees with the following characters:

588 of hay and lined with feathers It is a constant it as dent in Britain, but, owing to its busiling hibit and awift movements, is said on seen even in localities where

# Crescentiacem

the south, in Spain and Italy it is sommon, as well a in Provence, and it may be seen creeping on the oute walls of St Peters, at Rome — Its colour is of a deep value of or levers, as some law cooler to be deep blushingery, the wing-coverts and middle quild-jeathers black, those nearest the body edged with white This bird clings to the vertical faces of walls and rocks, just as the common creeper attaches itself to the perpendicular surface of trees

CREMATION, Are-mos-shun (Lat crems, I burn), de-notes the act of burning and is particularly applied to-the ancient custom of burning the dead

the ancient custom of binning the dead CREMOGALP, kre mo karp (Gr kremac, I suspend; karpos, fruit), in Bot, an initior two-celled, two seeded fruit, with a dry indelineent pericarp. The two cells or halves of which it is omposed are joined face to face to a common axis called a carpophore, from which they sepsiate, when ripe, to such an extent, that each remains suspended by a very situader cord. Fach half we termed a kemicarp or mericarp, and the inner face the commission. L'amples of the oremocarp, as above defined are only found in the Umbellific By Lindley the definition of cure morarp is extended as as to include

two cells CREMET, or CREMILLE, kro nel (Lat. creso, a notch)—The embrasures in battlements are so called occasion — and embrasures in partiements are so called it cause they resemble notches taken out of the parapet in Mil, a wall surmounted by a battlement is said to be crencllated (See BATTLEMENT) In Her, crenelle is a term implying that the outline of an ordinary is like that of the battlements of a wall

the definition of cremocarp is extended so as to include

fruits of a similar nature, but which have more than

CREOFE, his old, is a corruption of the Spanish credit, a term with h was originally applied to all the descendants of Spanial is born in America and the West Indies. It was nitrium is applied to the descendants of other Europeans who were hence distinction. tunshed as I icinch (roles, Danish Creoles, &c. As n w used, it is applied to such as have been born within or ness the trepse, and it includes persons of all clours, which is led to the common idea that it in plies an admixture more or less of African blood. In this country it is commonly applied to one born in South America or the West Indies, of Furopean parents

CRESCENDO, OF CRES, Lies shen' io, in Mus, a term employed to signify that the notes in the passage over which it is theed are to be gradually swelled. This contrivance must be very reful, as we learn, from a pussage in Cicero, that the R mans practised it containfully. The svell is although in one scuss applicable to all music generally numbered among them is treffine and delicate of its beautics, and in this sense is a very sed unby a the sentence or passage he sense is n verused unles the sentence or passage he very emphasic

(HISST area set (Fr crossette, s small cross), a gratt light stup natear n lighthouse, or watch two lt also signifies a torch of lamp, varieties with an expresented in the annexed illustration.



CRLSSITS.

Cressets were originally surmounted by a small cross. from which cust in they derive their name, and it was by evrying about a fiery cross that armies were raised in Scotland during the clden time. Shakspears makes use of the word in Henry IV.

The front of heaven was full of herry sparks, Of burning cressets

#### Creat

Leaves simple, alternate or clustered, without etipules; flowers irregular, growing out of old branches or steme; calvi free, entire at first, afterwards splitting irregularly; corolla somewhat bilabiate; stames didynamous (two long and two short), with a fifth of a rudimentary character; overy one-celled, and surrounded by an annular diek; fruit indebiscent, woody; seeds large and numerous, without albumen, enveloped in a pulp. The order includes about 38 species, which have been arranged in 11 genera. They are natives exclusively of tropical regions. The sub-said pulp, the fruit of Crescentic Cuyete, the calabash-tree, is eaten by the negroes in Jamsica, and the hard shell is used for holding liquor of sout, and for many other purposes. The fruit of Parmentiara edulis, another plant of this order, is eaten by the Mexicons, and that of P. cerifera is greedily devoured by cattle in Panama. The latter fruit resembles a candle in shape, and the plant is commonly called the candle-tree.

Chest, krest (Lat. crista, a tuit or plume for the helmet), in Her., a portion of the armorial bearings of a nobleman or gentleman entitled to bear coat-armour that is commonly used without the shield, being gainted on the doors of carriages, and engraved on plate and signet-rings. In the days of chivalry the crest or cognizance of the wearer was borne on the helmet. It was made of leather or light wood, gilded and painted, and a wreath of twisted silk was fastened round the lower part, where it was attached to the helmet. In modern times the crest is always drawn on a wreath composed of the principal metal and colour occurring in the bearer's coat of arms, the coils being of metal and colour alternately. Sometimes the crest rests on a cap of maintenance. Crests are supposed to have been introduced into England in the 12th century: they were then used as a means of recognizing the bearer in a tournament. They were generally assumed at the pleasure of the wearer; but there are cases in which crests have been specially granted to families which bear then; among which may be mentioned those of Drake and Hawkins, of Devonshire, the famous admirals of Queen Elizabeth; the former of whom bore a globe surmounted by; a ship, to which a rope was attached, held by a hand, in commemoration of his having circumnavigated the globe; and the latter a negro fettered with golden chains and manacles, for his achievements in the Spanish main.

CREST TILE, in Arch., the name given to tiles running along the ridge of the roof of a building, and surmounted with trefoils, or any other ornament, as a finish. They are chiefly used in Gothic architecture.

CRETACEOUS SYSTEM, kro-tui-she-us (Lat. creta, chalk), in Geol., the name given to the last or uppermost of the secondary formations. As developed in the south of England, it is composed of calcareous, argillaceous, and arennecous rocks, the former predominating in the upper, and the two latter in the lower portion of the system. The strata occurring in England have been arranged into the following groups:

- Upper chalk.—Generally soft white chalk, containing nodules of fint and chert, in more or less regular layers. Lower chalk.—Harder and less white than the upper, and generally with fewer filuts. Chalk marl.—A greyish earthy or yellowish marly chalk, sometimes indurated. Upper greenand.—Beds of silicious sand, occasionally indurated to chalky or cherty sandstone, of a green or greyish white, with nodules of chert. Gault.—A bluish tensicious clay, sometimes marly, with indurated argillaceous concretions and layers of greensand. Lower greenand.—Beds of green or ferruginous sands, with layers of chert and indurated sandstones, local heds of gault, rocks of green or chalky limestone (Kentish rag), and fuller's earth. A more comprehensive classification, derived from the study of continental as well as English strata, is given below, with the estimated thickness of each subdivision:—

Maestricht and Faxoe bods	100 feet
Titlier aboth with Hinte	500
White chalk without flints	600
Chalk marl	100
Upper greensand	100
Gault	150
589	1946 Burney

#### Cretinism

There is no place where all the above strata are present at once, and some are very local and inconstant. The Wealden beds, so called from their forming district knows as the Weald of Kent and Susser, have only recently been included in the oretaceous systems. They consist of sandstones and shales, with a few beds of limestone and ironstone, and, as developed in the south-east of England, they seem to occupy the size of an ancient estuary which received the clay and mud of some gigantic river, whose waters occasionally bore down the spoils of land plants and land animals, to be entombed along with those of equatic origin. The life of the whole oretaceous period was abundant, as the known fossils within the British area represent land plants, fresh-water and marine shells and flah, large terrestrial and marine reptiles, and species of every class of animal having hard parts capable of preservation, except birds and mammals; and even as regards these, most geologists believe their absence to be accidental, as both existed during the preceding period, though their fossil remains are very rare. The more important useful products of this system are chalk, flint, fuller's carth, phosphatic nodules, and the so-called "firestone rock." The two latter are extensively employed as manures.

sively employed as manures. CRETYMEN, krei-lin-tem, is idiocy arising from im-perfect formation or development of the brain, and generally accompanied with great bodily deformity. The name is of uncertain origin. Some derive it from The name is of uncertain origin. Some desires, a low Chreiter (Fr., a Christian), because they were generally regarded as beings incapable of sinning, and thus were viewed with some kind of respect. According to others, it is from the Romance, or Grison evening, a corruption of the Latin creatura, a creature. These unfortunate beings are chiefly to be met with in the valleys of the Alps, particularly in the Swiss cantons of Valais, Vaud, Grisons, Glarus, Uri, and Aargan; but they are by no means confined to these parts, being much more extensively spread than was at one time supposed. Cretinism is often accompanied with goitre (which see). There are various degrees of Cretins: some seem to be sunk in intelligence below the level some seem to be sunt in meangence below the leves of many of the brutes; while others are able to go about and attend to some easy labour. The Cretin seldom attains more than 4½ feet in height. The cranium is deformed, and has a conical shape, the forehead being thrown backwards, narrowed, and flattened, and the occiput being nearly on a line with the neck. Their eyes are small, the nose broad and flat, the mouth large and open, with the tongue often protruded, and the whole countenance is idiotic, or expressive only of lasciviousness. The flesh is soft expressive only of lasciviousness. The ness is soft and flaccid; the skin writikled, yellowish, or pale and cadaverous; the belly large and pendulous; the limbs crooked, short, distorted; and the gait imperfect and waddling. The cause of this infirmity is still matter of dispute among physicians. Some attribute it to the nature of the water by which an under account on dispute nuonic physicians. Some attribute it to the nature of the water, by which an undue amount of calcareous matter is conveyed into the system; others to the stagnation of the atmosphere in the deep nargow to the stagnation of the atmosphere in the deep narrow salleys. There are other causes that may possibly exert an influence upon it; as the poor diet and filthy, lazy, and intemperate habits of the people among whom it exists, together with the intermarriages among near relatives. There can be no doubt that it is in some measure hereditary, though all the children of a family are not affected by it. Many attempts have recently been made to improve the condition of the Cretin. The first thing to be done as soon as the disease manifests itself (for in many cassa it does not appear till some itself (for in many cases it does not appear till some time after birth,—sometimes not before the sixth or time after birth,—sometimes not before the sixth or seventh year) is to remove the sufferer to a pure bracing atmosphere. The treatment required is first to get the body into a healthy condition, by simple and nourishing food, warm clothing, frequent bathing and friction of skin, and gentle exercise. The development of the mind will follow that of the body, but must be done very gradually. Dr. Guggenbühl was the first that made any systematic attempt to educate the Cretin. He opened his institution on the Abendberg, in the

canton of Bern, Switzerland, in 1840; and since that time several other institutions for the same purpose have been established on the continent.

CREW, kreu (a contraction of Sax. cread, or cruth, a Curw, kees (a contraction of Sax. cread, or cruth, a crowd), in Mar., the company of sailors belonging to a ship, boat, or other vessel. In an English vessel of war the entire crew are thus arranged in groups:

1. Warrant and subordinate officers; 2. chief petty officers; 3. working petty officers of the first class; 5. comprehends all those lower in rank than the fourth class. A chief seronany or crew is also subdivided into see prehends all those lower in rank than the fourth class.

A ship's company or crew is also subdivided into several minor groups,—the hoatswain's crew, the gunner's crew, the sail-maker's crew, &c.

CRIBBROF, krib'-bij (Ang.-Sax.), a game played by two persons with a complete pack of fifty-two playing-cards. It is divided into two classes, the five-card

and the six-card games. The five-card is the original game, and affords the greatest scope for the exercise of skill. The points are scored upon a board, and sixty-one points constitute the game. All the kings, queens, knaves, and tens, count as ten each, and the rest of the cards according to their ordinary value; that is, six for six, five for five, and so on. The points which reckon for the game are fifteens, sequences, flushes, pairs, &c. After dealing, the players gather up their cards, and having taken out two each, place them, with their faces down, on the table. These four cards form the "crib," which becomes the property of These four the dealer, under certain conditions. Points are scored in two different ways in cribbage,-first in play, and an two concrete ways in cribbage,—nest in play, and second in reckoning up the cards held. After the crib is put out, the pack is cut by the non-dealer, and a card turned up by the dealer. When this card is a knave, it is called "two for his heels," and counts two to the dealer; and a knave held in hand, of the same suit as the turn-up card, entitles the player to score one; it is called "one for his nob." Six-card cribbage is played called "one for his Bob." Six-card cribbage is played in a very similar manner, but is inferior in science to five-card cribbage. When three parties play at the game, each plays on his own account; and when four play, sides are generally chosen. (For rules, &c., sce Bohn's Handbook of Games.)

Bohn's Handbook of Games.)

! Carcurar, kvik'-et (Du. krekel).—This well-known little insect has been, and is still, a subject of much delusion. Notwithstanding that modern naturalists have cleared up all mystery connected with the cricket, if ever any existed but in the rude and untangbt mind, still, at the present day, there is many a household in England any member of which would be consistent that chirms of the cirket with some fatality. associate the chirping of the cricket with some fatality, and consider it an alarming omen. Thanks, however, to the variety of superstition, by many persons it is considered as a sign of good luck, although with about as much reason as in the former notion. At any rate, it possesses the merit of being a less harmful superstition, and may, without much injury, remain, until a purer and truer knowledge shall dawn in the dark corners that are still untouched with the blaze of Processes. The cause of the obliging noise made by the gress. The cause of the chirping noise made by the cricket, and which is so familiar to the fireside listener during the cold winter evenings, is simply the friction of the wing-covers against each other. The house-cricket is about an inch in length, and the antenne often half again as long as the whole body. It is found in various parts of Europe, more particularly in the south. In Great Britain it is very abundant. Only in the sinter months does the cricket take up its abode with man, usually selecting rooms on the lower floor, and greatly affecting the kitchen, where there is gene-rally as lack of food lying about. Sometimes it selects chings and crevices in which to hide, and often burrows in the mertar, where, through the long evenings, it chirps continuously. Its monotonous chant is conchirps continuously. Its monotonous chant is considered very amusing by some; by others, whose temperaments are of a nervous nature, it is thought to be disagreeable and irritating. In the summer, the cricket takes its departure, and finds an abode in the crevices takes its departure, and finds an abode in the crevices of garden-walls and such-like places. At this season it does not forget its melody but it is said, in the fine summer evenings, to chirp more pertinactously. The deld-cricket is also found in this country, but is not nearly so common as the preceding species. It is exceedingly reserved in the labits, avoids the society of man, and prefers hot, and y localities; it burrows in

#### Cricket

the ground, and there lies all the year round. field-cricket is carnivorous, and preys upon other in-sects. It is larger than the common species, and its chirp is much louder. Another interesting species is the mole-cricket, whose habits are very singular, and greatly resemble those of the animal from which it is named. In its structure, too, there is a remarkable named. In its structure, too, there is a remarkable similarity. This insect is continually engaged in excavating galleries under the earth, some of which are of considerable dimensions. To enable it to do this with perfection, its anterior limbs are connected into



CRICKET.

a pair of flat fossorial organs, which are in appearance much like the hand of the mole. In its burrowing processes, it does great injury to the roots of plants. With regard to its diet, little is positively known; and whether it lives on vegetable or animal food, is still a matter of uncertainty. By some authorities, however, it is said to feed on both roots and insects. The female of this species prepares a large chamber wherein to lay her eggs, which are said to be from two to four hundred her eggs, which are said to be from two to four hundred in number. Until after the first moult, the young remain together, but then take their departure, and commence burrowing on their own account. The mole-cricket is usually about two inches in length, and is of a brown colour. The most extraordinary cricket is that found in Sieily (Grythes megacephalus), which chirps sufficiently loud, it is said, to be heard distinctly to a wild distant (1). at a mile distant (!).

CRICKET (Sax. cryce. a stick), a well-known national English game, played upon a level piece of turf, generally about one or two acres in extent. In a full game of cricket, there are eleven players on each side; and two bats, a ball, and two sets of wickets, with bails, are required. There must also be two umpires and two required. There must also be two umpires and two scorers. Although an ordinary game is usually played with eleven on each side, there is no restriction as to numbers; the parties may stipulate for eleven against twenty-two, twelve against twenty, &c. When a game is about to be played, the wickets or stumps are placed opposite to each other, three on either side, at a distance of twenty-two yards. Each wicket is twenty-seven inches in height above ground, and the three are connected at the top by two loose bails, four inches long each. Two lines are then drawn upon the grass at either end. The first is in a line with the stumps, and is called the "bowling-crease;" the other is parallel, four feet in front of the wicket, and is called the "popping-crease." Having chosen sides and tossed for innings, the players on the side which is out take their places. The bowler places himself behind the wicket from which he intends to bowl, and the wicket from the contract of the wicket of the creaty behind the wicket opposite to him. is about to be played, the wickets or stumps are placed keeper directly behind the wicket opposite to him. The rest of the men on the outside are called fielders, and consist of the long-stop, point, cover-point, short-slip, long-slip, middle-wicket, long-field off, long-field on, and leg. All being arranged in their places, the players on the inside send out two batsmen, who take up their posts before each wicket respectively. One of the unpires then calls "play!" and the bowless delivers the ball towards the opposite batsman, his object being either to hit the wickets or to bowl it in such a way that the batsman may play a catch. In either of these cases the striker is out. But if the batsman can hit away the ball to such a distance that

Crima

Crocket

he is able to exchange places with the opposite bats-man, he scores one run to his side. Every time an man, he scores one unito his side. Every time an exchange of places safely occurs, a run is scored to the side who has the innings. The delivery of every four balls constitutes an "over," when the bowling is transferred to the opposite wicket, and all the fielders change their positions accordingly. When a batsman is put out, another of the players on his side takes his place, and so on, till all the players but one are put out, when those who have had their innings field out and those who have hear fleiding out take their innings. Each blave been fielding out take their innings. Each wao nave been neuting out take their innings. Each side has two innings, and the party that makes the largest score wins the game. There are several stringent laws with regard to the bowling. If the bowler sends a ball on the outside of the "popping-crease" at the opposite wicket, it is called a "wide ball," and scores one to the justide. The bowler must blee delivers scores one to the inside. The bowler must also deliver the ball with one foot behind the "bowling-crease;" the ball must be bowled, and not thrown or jerked and the howler must not raise his hand or arm above his shoulder in delivering the ball. An infraction of these rules constitutes a "no ball," which scores one to the inside. There are many other laws of cricket, which have lately been revised. (See The Cricket-bat, and How to Use it,—Baily Brothers, Cornhill: 1861; Felix On the But; and Lillywhite's Guide to Cricketers.) Though comparatively modern in its origin, cricket seems to have taken the precedence of all other national games. Nearly every town, village, and school, possesses its cricket-ground; and cricketers are to be found in all classes of the community, from peers to peasants. Military authorities hold the game in such high estimation, that soldiers are encouraged to play at it in their leisure. No game tends more to the development of muscular strength and activity then cricket. Many professional men in England make their living by playing matches. The Maryle-bone and the Surrey clubs are the most influential, and the "Eleven of all England" and the "United Eleven" are the two finest cricket-clubs in existence. In 1859, a number of cricketers went from England to America and played a number of matches, on account of a challenge which came from the latter country; and in 1860-61, another body went to Australia, where they played many games. In both cases success attended the cricketers who came from the Old country.

CRIME, krime (Lat. crimen, Fr. crime), is the violation of a right when considered in reference to the evil tendency of such violation as regards the community at large, although it may be a civil injury if considered in relation to the damage which the party who is made the subject of it individually sustains. The distinction of public wrongs from private, -of crimes from eight injuries, seems, upon examination, to consist in this,—that private wrongs, or civil injuries, are an infringement or privation of the civil rights which belong to individuals, considered merely as individuals. Public wrongs, or crimes, and misdemeanours, are a violation of the same rights, considered in reference to their effect on the community in its aggregate capacity; and, thus understood, they are classed either as

folionies or misdemeanours (which see).

ORIMINAL LAW. (See LAW.)

CRINOIDEA, kri-noid's-ä (Gr. krinon, lily: eidos, likeness), an exteusive order of animals, chiefly fossil, belonging to the class Echinodermata, and so named from their lily-like appearance. In existing sens, the crinoids are represented by the Comatulæ, or featherstars of our own shores, and by the rare and all but extinct Pentacrinites of the West Indies. The comatula, though free-floating in its adult state, is attached by a stalk to the sea-bottom when young; attached by a stalk to the sea-bottom when young; the Marsupite, a fossil form, appears also to have been free in its mature state; but every other crinoid was provided with a long, slender, many-jointed stem, by which it was fixed, during life, to the roes. The characteristics of the order, which is of wast goological interest, are well exemplified in the Pertacrinus. This animal may be described as a stalked covactule. The stalk, which is composed of calcareous joints or ossicles articulated to each other by radiated authorize a contract a variety of recentsful are un formed. surfaces, supports a vasiform receptacle or cup formed of five calcareous plates, and in this receptacle the digestive and other viscers are situated. The upper part of the receptacle is covered by a plated integra-

ment, in which there is an aperture for the mouth. From the brim of the oup proceed ten many rayed area, farnished with articulated feelers or pinnes captale of expansion and contraction, for the captale of prey. The principal fossil families are described under the head of ENCRIBITS.

CENTOLINE, krin'-o-leen (Lat. crinis, hair), a stiff fabric formerly made of horse-hair, and used in order to distend female apparel. The term originated among the Parisian milliners, and at first was only applied to this particular kind of hair-cloth; but it is now applied to every kind of hoop by which women's dresses are expanded. The hoop or crinoline, as now now applied to every kind of hoop by which women's dresses are expanded. The hoop or crinoline, as now generally worn, is made of various materials; such as cane, whalebone, steel wire, &c. Some are made of very extensive size, reaching a circumference of even five yards. The hoop came into fashion about 1856, and has remained in vogue ever since. The habit of wearing hoops is not new, as they formed an article of attire in the reign of Elizabeth: they were then called furdingales. They went out of fashion in James I's reign that came in again in 1711, and for James I.'s reign; but came in again in 1711, and mained in fashion till the reign of George IV

mained in fashion till the reign of George IV. They were then only worn by the courtiers; their use had been given up in private life. The king abolished their use in court at last by royal command.

CRISIS, kri'-sis (Gr. krino, I decide), in Med., denotes the decisive period or event of a disease,—a sudden and considerable change of any kind, occurring in the course of its progress, and producing an influence upon its character. Among a releast plusidings it was upon its character. Among ancient physicians, it was applied to that tendency which fevers were supposed to possess, of undergoing a sudden change at particular periods of their progress. Hence there were what were called critical days,—certain days in the progress of an acute disease on which a sudden change, either favourable or unfavourable, would take place. seventh, fourteenth, and twentieth or twenty-first days, were regarded as eminently critical. Little importance is now attached by medical men to critical days.

CRITIMUM, krith'-mum, in Bot., a gen. of umbelli-ferous plants. The species C. maritimum is the sam-phire, which is commonly used as an ingredient in mixed pickles. It is found growing on the seashore, and occasionally on old walls.

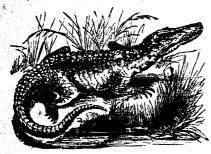
CRITICISM, krif'-e-sizm, has been defined to be "the art of judging with propriety concerning any object or combination of objects." In a less extended sense, it is the application of the principles of taste to matters connected with literature and the fine arts. The obconnected with interactive and the fine ares. The object which it proposes is to distinguish what is beautiful and what is faulty in every performance; from particular instances to ascend to general principles, and so to form rules or conclusions concerning the several kinds of beauty in works of genius. It lays down those forms or ideas which answer to our con-ception of the beautiful, and points out, by reference to these, the excellencies or defects of individual works. The rules of criticism are not formed by any induction à priori,—that is, they are not formed by a train of abstract reasoning independent of facts and observations. Criticism is an art founded wholly on experience, founded on the observation of such beau-ties as have been found to please mankind most generally. Such observations, taking their rise at first from feeling and experience, were found upon examination to be so consonant to reason and the principles of human nature, as to pass into established rules, and to be applied for judging of the excellency of any performance. In a still more limited sense, criticisms is applied to a particular branch of literature. To this branch belong essays or articles in magazines, reviews, &c., upon particular books, pointing out their various merits and defects.

CRITIQUE, or CRITIC, krit-eek', krit'-ik, in Phil., is a term adopted from the Germans, and is applied to the science of the pure faculty of reason, or the investiga-tion of that which reason is able to know or effect ton of that which reason is able to know or effect independently of experience. It is applied to the philosophical system of Kant, from his famous work entitled the "Kritik der reinen Vernunft" (Criticism of Pure Reason). (See Kantlan Philosophia, Crocket, krok'-et (Fr. crocket), in Goth. Arch., an ornamental projection on the edges of the sides of pinnacles, canopies, spires, &c., consisting chiefly of

# Crocodile Family

leaves and knots of foliage, and occasionally of animals. They were small and insignificant when they were first introduced; but they became larger and bolder in the Decorated and Ferpendicular English styles.

Caccorns Family, krok-o-dile (Gr. krokodeilos), the largest order of the Saurian order of reptiles. The tail is flattened at the sides; there are five anterior and four posterior toes, of which the three inner ones only on each foot are armed with claws; all the toes are more or less joined by membranes. There is a single row of pointed teeth in each jaw; and the tongue is fleshy, flat, and attached very nearly up to the edges, which led to the ancient belief that the erocodile was without a tongue. The back and tail are evered with large and strong square scales, elevated into a ridge on their middle. There is a deeply dentionated crest on the tail, at the base of which the crest becomes double. The scales of the belly are against delicate, and smooth. The noistrils are opened at the end of the muzzle by two small crescent-shaped alits, closed by small valves, and lead, by a long and straight canal pierced in the palatine and sphenoidal bones, to the bottom of the back part of the mouth.



CROCODILE.

As the lower jaw is prolonged behind the skull, the upper jaw has the appearance of mobility, but it only moves in concert with the whole of the head. The external ear is shut at will by two fleshy lips. The eye has three lids. Under the throat are two small glanhas three lids. Under the throat are two small glandular orifices, whence issue a musky secretion. Like the rest of the Lacertæ, crocodiles are oviparous. Their eggs are deposited in the sand or mud on the banks of the rivers they frequent; and the young, when hatched, immediately proceed to the water. The egg of the crocodile is not much larger than that of the goose; but it is very much harder, and its form more oblong. As is the case with many newly-born creatures, the head of the young crocodile seems monstrously large as compared with the rest of its body. "The laying of the eggs," says M. Ricord, "takes place in April, and the number amounts to from twenty to twenty-five, more or less, laid at many times. The to twenty-five, more or less, laid at many times. The semale deposits them in the sand with little care, and scarcely overs them. I have met with them in the lame which the masons have left on the banks of the river. If I have reckoned right, the young ones come forth on the fortieth day, when the weather is not too cold. At their birth they are five or six inches in length. They are hatched alone; and, as they can do without nourishment while coming out of the egg, the female is in no hurry to bring it to them. She leads them towards the water and into the mud, and disgorges for them half-digested food. The male takes no account of them." In crocodiles the number of teeth does not vary with age, as in other animals, the teeth being hollowed at the base in such a manuer as to serve for the case or sheath of the germ of the tooth serve for the case or sheath of the germ of the toomerous, large, and of unequal length. Chvier says that the crocodile cannot swalkow while in the water, but that it first drowns its prey and places it in some nook under water, where it is allowed to putterly before it is eaten. This is denied by certain modern travellers and natu-

#### Cross

favour of Cuvier's opinion. The prey of the oregodile is chiefly fish, but it derives a considerable part of its suste-nance by lying in wait in the evening at the water's edge. hance by tyling into the water any amail quadrujed may come to drink. They have been killed in Egypt exceeding thirty feet in length. Its colone, a full grown, is blackish brown slove and yellowish. nun grown, is mackish brown above and yellowish white beneath; the upper parts of the legs and the sides are varied with deep yellow, and parts of the body bear a green tinge. No living specimen of this family is found in Europe, nor has any at present been disco-vered in Australia. Africa is the native country of the crocodile, and it is also found in Madagascar. The crocodiles are generally considered as forming a natural passage from the saurians to the chelonians, to the last genera of which, in certain points of their conformation and habits, they nearly approximate. The Crocodilida are divided into two great families,—the crocodiles proper, which are distributed in the Old and New world, and the alligators, which are peculiar to world, a.

CROCUS, kro'-kus (Gr. krokos), in Bot., a gen. of plants belonging to the nat. ord. Iridacea. From the species C. vermus and versicolor numerous varieties have been produced by cultivation, which are of great value in the flower-garden, on account of the early appearance and remarkable brilliancy of their flowers. sativa is the saffron crocus, the karcorn of the Bible. C. satted is the sauron crocus, the karcorn of the Bible. The dried stigmas of this plant, with the top of the style, constitute kay-soffron, or, when pressed together, cake-suffron. The latter is seldom met with in the shops, the product sold for it being simply the pressed florets of the saflower. (See Carinamus.) Saffron is much used as a flavouring agent on the continent and in the East. In Britain, it is principally employed as a colouring agent in pharmacy, and medicinally in certain nervous affections, and as an emmenagogue.

CROMERCH. (See CELTICA ARCHITECTURE.)
CROP, krop (Ang.-Sex.), a term applied to the quantity of corn, roots, grass, &c., grown on a piece of laud at one time. The order in which different crops are made to succeed each other was not made a subject of scientific research till the middle of last century.

CROSIER, kro'-zhur (from the root of cross), the crook or pastoral staff of a bishop, the emblem of pastoral authority and care. Strictly speaking, the crosier is a staff surmounted by a cross, although it is generally confounded with the pastoral staff, which is made in the form of a crook. The use of crosiers is very ancient. The Byzantine crosier had at the top eithera cross or a knob, with curved When the serpents on both sides. bishops pronounce solemn benediction, they take this emblem into their hands. These staves were sometimes barely curled, and sometimes were highly ornamented and enriched with costly jewels. One of the most costly crosiers remaining in England is that of William of Wykeham, of silver gilt, richly enamelled. It is exhibited to visitors in the chapel of New College, in Oxford, to the so-ciety of which the bishop presented it in 1404. Another fine crosser is that of Bishop Fox, preserved at Corpus Christi College, Oxford.



Cross, kros (Lat. crux), a common instrument of capital punishment among the ancients. It was made of two pieces of wood, crossed either at right angles or otherwise, on which the bodies of the malefactors were fastened, and left exposed till death put an end to their sufferings. After the crucifixion of Christ, the cross became the emblem of the Christian religion. Constantine, believing that he had guined his victory over Maxentius through the sign of the cross, caused them to be set up in public places and upon public buildings. caunot swallow while in the water, but that it first drowns its prey and places it in some nook under water, where it is allowed to putrefy before it is eaten.

This is denied by certain modern travellers and naturalists, but many reliable authorities quote instances in nished to find that the natives used the cross as a religious symbol in their temples. Early in the Christian dispensation, however, the cross became an entlem of the religion. The large cross over the entrance to the chancel of a church was called the Rood, or Holy Rood, and became an object of veneration. The rood was often elaborately ornamented. Crosses are of various forms: in the Latin cross, the horizontal

CROSSES

bar crosses the perpendicular near the top, while, in the Greek cross, which is similar to the cross of St George, the horizontal crosses the perpendicular in the centre. In the cross of St Andrew, the two bars the centre In the cross of St Andrew, the two bars cross each other diagonally After the union of Scotland with England, the cross of St George and that of St Andrew were blended, forming the union jack. The St Andrew were blinded, forming the union jack. The Malties cross is merely the Greek cross, with an orns mental expansion of the ends. Monumental crosses were often raised (tiber to mark a boundary or the enfrance to a sanctuary. Many striking remains of these crosses are to be found in Great Britain and Related Monumental crosses are reserved by Edward Company of the crosses are to be found in Great Britain and relund Monumental crosses were erected by Fdward I on the places where the body of Queen Eleanor rested while being borne to buttal at Westminster The crosses of Charing, Cheapside, and Waltham, belonged to these. The two forms have disappeared. belonged to these. The two forms have disappened, but the latter still remains. Market or town crosses were originally stands from which the celesiastics preached. St Paul's cross was one of the most famous of these. It was situated near the present sit of St Paul's Cathedral, and was a sentially a place of preach and for the town. It was, in the latter days, in the form raus scatterars, and was e sentially a place of picach ang for the town. It was, in its latter days, in the form of a plain pulpit, made of wood, and was surmounted by a Maitese cross. Round it were arranged seats for the audience. It was displeasing to the Puritans, and was demolished by order of the parliament. Nearly every old town in England has either a town cross or the seminant of one. the remains of one

CROSS, VICTORIA, a reward which may be granted cases, victoria, a reward which may be grunted to a soldier of any rank to mail any act of valour. It was first justified in 15 6, at the conclusion of the Crimean war. It is in the form of a Malless cross, and is composed of metal taken from the Russian guns capture 1 at Schastopol. In the centre of the cross is the royal crown surmount d by a hon, and on a scroll below is the legend, "For Valour" On the clasp below is the legend, For valour. On the classy two branches of laurel are represented, and the cross hangs from it supported by the letter V. The ribbon worn by solders is red, and that worn by sailors blue Pach recipient of the Victoria cross receives a persion

of £10 per annum

of £10 per annum Crosspill, kraw bit (Ioam curin odra) — The range of the crossbill extends from the north of I urope as far as Greenland. The most singular chair cert-rice of this bird is its beak, the upper and lower mandbles being equally cuived, hocked, and the clongated points erossing each other. Buffon speals of this premiants as an error and detect of nature, which clearly enough the conditions are transfer to the conditions of the conditions of the conditions are transfer to the conditions of the condi shows that he was totally unacquainted with the birds nature. Its favourite food is the fruit of the pine, and of the efficacy of the crossed mandibles in splitting and \*The beak of the crossbill a altogether unique in form; the mundibles do not he upon each other with their lateral edges in opposition, as in other birds, but their lateral edges in opposition, as in other birds, but their lateral edges in opposition, as in other birds, but their lateral edges in opposition, as in other birds, but their lateral edges in opposition, as in other birds, but the restriction, the face is red and swollen, the eyes sufferings of the right, and everything indicates the great sufferings of the patient. In extreme cases, as the disease advances, the breathing becomes more difficult, the cough more sufficiently or called the great sufferings of the patient. In extreme cases, and the counterance hird, and gradual insensibility or convulsions at length close the scene. The factal issue often takes place in thirty hours and even less, but wards, and to the right. When holding the head of this convulsions at length close the scene. The factal issue often takes place in thirty hours and even less, but wards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left, the under portion turned upwards, and to the left the under portion turned upwards, and to the left the under portion turned upwards, and to the left the under portion turned upwards, and to the left the under portion turned upwards, and to the left the under portion turned upwards, and to the left the under portion turned to the rest suffering to the patient. In extreme case, but the great suffering to the patient in the respiration, the deep submards the threat suffering to the patient. In extreme case, but the great suffering to the patient in the respiration, the deep submards the threat suffering to the patient in the extracting the kernels from nuts there can be no doubt

peint of the upper, but not beyond it towards the left side, while on its own side the point passed with ease to a distance of three-eighths of an inch. The upper mandible has a limited degree of motion on the cramandote has a limited degree of monous on answering num, the superior maxillary and masal bones being united to the frontal by a flexible bony lamina. "

(Yarrell) The chief colour of the crossbill's plumage is ashy-rrey, with a greenish inge on the upper parts, while the lower parts are yellowish green. Its bill is born-colour, its length about six inches. This is the plumage of the adult bird, after the first moult, howplantage of the state of a terr to earst mouth, now-ever, and until the bird is a year old, all its upper and lower parts are of a tarmshed red, more or less tinged with green and yellow, while the lower coverts of the tail are white, with a brown spot in the centre.

tail are white, with a brown spot in the centre.

Choss Buns, a small spiced cake, narked with a cross, and specially prepared for Good Friday. The hot-cross-bun is the most popular symbol of the Roman Catholic religion in Figliand that the Reformation has left, they are supposed to represent the eulogies, or consecrated loaves, given sway as alms to those who, from any impediment, could not receive the host. They were madded with a cross similar to that on the Good Friday hun.

Good Friday bun

CROYALISIA, kro-tā lav-re-ā (Gr krotulon, castanet; on account of the rattling of the seeds in their inflated nods, when shaken), in Bot, a gen of plants belonging to the nat ord Leguminose, sub-ord Positioneese. C' nunca, an Indian plant, furnishes a coarse fibre cilled ann, sinn shansm, taaq, or Bengal kemp, when is often confounded with vanue, the fibre of the Histories cannabinus C. tenuifolia, another Indian species, is the source of the Jubhulpore hemp

the source of the submittees army
CROTAIUS (See RATTLE SNAKE)
CROTCHET, kroth'et (Fr crochet), the third principal
note in music It is equal in duration to half a minim,
or the fourth of a semily eve

CROTON, kro'-ton (G1 kroton, the dog-tiek, in reference to the resemblance of the seeds to that vermin), in Bot, a gen of plants belonging to the nat. ord. Emphorbacea. The seeds of the species C. Tulium, and probably also those of C. Parana, constitute the croton, ortigium also those of C Parana, constitute the croton, ortifician seeds, of the materia medica. They yield, by expression, an oil called croton oil, which, in doses of from one to three mains, is a powerful drastic cathartic, and, when applied externally, acts as a rubefacient and counter irritant. The seeds are used without preparation, in India, as purgative pills. C Electric and Cascarilla, natives of the Bahama islands and Jamaica, yield the aromatic tome bark commonly known as case irilla or eleutheria bark. C pseudo China violds the coulled conglish hards of Peraira, and C wither yields the quilled copaiche bark of Pereira, and C suberosum the corky copaiche bark of the same author. In their medicinal properties the copalche banks resemble cascar lia The aromatic bark known as Malambo bark is the produce of C Malambo It in extensively used in Columbia as a remedy in diarrhera and as a vermifuge, also externally, in the form of an alcoholic tincture, in rheumatism

CROUP, kroop (Ang. Nor), in Med, is an scute in-flammation of the mucous membrane of the larynx, but frequently extending also to the traches and bronches tubes. This disease is not mentioned by medical writers before the middle of last century, and it is the writers before the middle of last century, and at us no epimon of many that stid do not exist prior to that time. It is a disease that is very prevalent and fatal among infants. It is usually preceded by the symptoms of a common cold, with hoarseness and a haran cough, pain in the head, fever, and swelling and redness in the back of the throat, but if may make its appearance suddenly during the night, in the midst of apparent health. In a short time the respiration becomes noisy and difficult, accompanied by a growing sound during. occurs after the age of publicty, though occasionally it is to be met with among adults. It is most comman in cold damp seasons and in low marshy localities. In so rapid and fatal a disease, medical advice ought to so rapus was natus a cusease, medical advice ought to-be immediately obtained. Biseeding, except by leeches, is not now generally approved of by medical men: some recommend emetics and purgatives; others optum and calorael. Warm bathing, or spouging with warm water, should be had recourse to, as well as the inhalation of a water water. the inhalation of a watery vapour.

CROW, COMMON, OF CARRION, kro (Sax. crave) (Cor-cus Corone).—This common British bird is, perhaps, as well known, and at the same time as little liked, as any festbered creature. The farmer hates him for his appetite; the rural inhabitants hate him because so does the farmer; and, on account of his sombre attire, connected with the agricultural interest are seldom squeezish about the fate of a crow, nor upt to regard as siight but a justly-punished criminal the wide-spread and gibbeted carcass of poor corvus set out, as in a pea-field, as a warning to its reliets. Only it happens that the crow is gifted with an extraordinary amount of intelligence, he would, erc this, have been banished from the face of the land. The carrion crow is spread over the Old and New continents, and feeds, like the ravens, on any sort of animal offul, or, when this is not worms, moles, mice, caterpillars, grubs, beetles, &c. In the winter it associates with the rooks, and may be seen with them busily turning over the earth in search of food. The nest, like that of the rook, is constructed at the summit of a tree of slender branches, matted with clay and horsedung. The hen lays four or five eggs of a palish green, sometimes blurred and spotted with a darker colour. They lay but roce in the year, unless the young or the eggs he destroyed by accident. It is said that the crow may be domesticated, and taught to speak as distinctly as the raven. "The carrion crow will feed yoracionsly on ripe cherries; and in the autumn he will be seen in the walnut-trees, carrying off from time to time a few of the nuts. With the exception of these two petty of the nuts. With the exception of these two petty acts of depredation, he does very little injury to man during nine or ten months of the year; and if in this period he is to be called over the coals for occasionally throttling an unprotected leveret or a stray partridge, he may fairly meet the accusation by a set-off in his account of millions of noxious insects destroyed by him. However, in the spring of the year, when he has a nest full of young ones to provide for, and when these young begin to give him broad hints that their stomachs would like something of a more solid and substantial nature than mere worms and caterpillars, his attention to game is enough to alarm the atoutest-hearted squire or henwife. These personages have long sworn as eternal enmity to him, and he now, in his turn, visits, to their sorrow, the rising hopes of the manor with ominous aspect; and he assaults the broods of the duck-pond in revenge, as it were, for the many attempts both squire and henwife have made to rob and strangle him."—(Waterton.) The hooded crow Corne Corner) is rather smaller than the preceding, with black head, throat, wings, and tail. Its name is derived from the contrasted black head and grey body. It is more ferocious than the carrion crow, and has heen known to pick out the eyes of lambs, and even of horses helplessly hampered in bogs. In certain parts of the Farce Islands it is no uncommon thing for these birds to assemble in great force, say a thousand in number, and, while the rest appear to sit wrapped in the profoundest attention, one or another will flutter the profoundest attention, one or another will flutter his wings and "caw" at a tremendous rate. When he has done another begins; and so the meeting continues for an inclusion so. Then they break up, and it is not uncommon to find one or two birds left behind dead. The mixes have a belief that these meetings refer to the critical behaviour of some of the flock, and that the critical behaviour of some of the flock, and that they, if found guilty, are executed on the spot. The Alpine crow, or choeard (Pyrrhocorax alpinus), has the compressed arched and sloped beak of the black bird; but its nostrils are covered with feathers like those of the crow, to which it has been annexed. It lowers of the crow, to which it has been annexed. It lowers of the crow, to which it has been annexed. It lowers of the crow, to the higher mountains, descending in immense flocks to the valleys. The nutcracker crow is platform, and descending in immense flocks to the valleys. The nutcracker crow is platform, and the clerical tonsure of the Roman Catholics. (See long of gold, surmounted alternately with four crosses and four fleurs-de-lis. Four arch-diadems, enriched with pearls, arise from these, and close under a mound en-

family in several particulars. It is not uncommon in many parts of Europe, but rarely visits England. Pennant remarks, that the specimen from which his description was taken was the only one, that he has ever heard of that was shot in the three kingdoms.

CROWBERRY. (See EMPETRACEE.)

CROWN, krown (Lat. corona), an ornament placed upon the head, denoting regal or imperial dignity. Crowns were originally garlands formed of leaves, and in that form have been used by almost every nation. The regal crown first originated in the diadem, which was a fillet fastened round the need and tree behind. was a filler rastened round the field and tied beinda. It is represented in the statues of Jupiter, the Ptolemies, and the kings of Syria. Kings were, however, generally distinguished by a fillet of a different colour from that usually worn. It was mostly in the form of a golden band, which, in time, began to form the basis of raised ornamental work, studded with coatly jewels. The crown was used by the ancient Greeks as an emblem of office, as an ornament for victors at public games, and as a mark of distinction for citizens who had games, and as a mark of distinction for citizens who had specially serred their country. Amongst the Romans the crown was still more generally used. The corona obsidionalis was the crown most highly prized. It was bestowed by an army or beleaguered garrison on the general who rescued them. It was made of leaves or wild downs set the still down and the still downs are the still downs wild flowers gathered on the spot. The civic crown, composed of oak-leaves and acorns, was the crown next



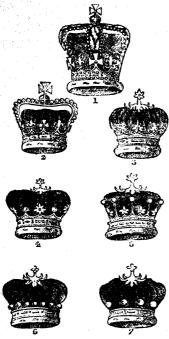
1. Civic. 3. MURALIS.

VALLARIS.

in esteem. It was bestowed upon any soldier who saved the life of a Roman citizen in battle. The man who gained it was entitled to many privileges. The mural crown, made of gold and surmounted with turrets or battlements, was bestowed upon the soldier who first scaled the ramparts of a besieged city. corona vallaris was bestowed on the person who first mounted the rampart or entered the camp of an mounted the rampart or entered the camp of an enemy; and the corona navalis was bestowed on him who first boarded an enemy's ship. Both the mural and civic crowns are used at the present time in heraldry. The triumphal crown was of three kinds, and was bestowed upon generals who had obtained a triumph. Several other crowns of different forms were worn by the Romans. Among these may be mentioned the sacerdotal crown, sometimes made of gold, some-times of cars of corn, and sometimes of olive leaves. It was worn by the priest and bystanders during a sacrifice. The funeral or sepulchral crown was placed upon the head of the dead. In Greece these crowns were usually made of parsley, The convival crown was a wreath of flowers worn on festive occasions. The nuptial crown was a wreath of verbens placked by the bride and worn by her. The natal crown was a chaplet hung over the door of a chamber where a child was born. — (Ref. Smith's Dictionary.) The crown is a term often used in Great Britain in order to designate

#### Crown Lands

signed with a cross pattée. The gold circle is also adorned with diamonds, sapphires, rabies, pearls, &c. The crowns worn by princes and noblemen are called exponents, that of the prince of Wales (2) is composed of a circle or fillet of gold; four crosses pattées are placed or mother than the between the area community. round the edge between the same number of fleurs-de-lis. From the two centre crosses a bent arch extends, surmounted by a mound and cross. The coronet of a duke (3) is a circle of gold, richly chased, having on the



CROWN AND CORONETS.

edge eight strawberry-leaves; that of a marquis, (4) a circle set round with four strawberry-leaves, and as many pearls interposed on pyramidal points. In an earl's coronet (5) there are eight pearls, set on pyramidal points, and eight strawberry-leaves, which are lower than the pearls; that of a viscount (6) is surrounded with pearls coly, the analyse heart unlimited. rounded with pearls; that of a viscount (6) is sur-rounded with pearls only, the number being unlimited; a baron's coronet (7) has only six pearls, all at equal distances. All the coronets of the British nobility, as at present worn, surround caps of crimson velvet, turned up with ermine. Viscounts and barons had rurned up with ermine. Viscounts and narons had no coronets allowed them until after Queen Bitzabeth's reign. The coronet of the kings-at-arms is a plain fillet of gold with sixteen leaves, half of which alternately are higher than the others. Miserere mei Deus is the motto on the band.

CROWN LANDS, the lands, estates, or other real property belonging to the crown or sovereign. The crown lands of Eugland are now contracted within narrow bounds, having been granted away at various times to subjects. William III. so impoverished the crown property in this way, that an act was passed by which it was decreed that all grants of crown lauds for more

# Cruciferm

on the lower corners of the frame-work, and are fitted into a central vertical king-post near the top of the pertition. In this case the crown-post ties the heist sound joiste of the partition, and affords a means of

cupport to the centre of the floor above.

CROWN-WORK, krown'-wurk, in Mil., the name g
to outworks of a peculiar form, somewhat resem the general outline of a crown, situated beyond the principal works of any fortified place. They was formerly called horn-works, consisting of two con-verging flanks, connected at the ends nearest the country by a rampart with a re-entering angle in the centre, the whole work being like the letter M in form The most common form now adopted by military engineers for a crown-work is that of a front consisting of two of the faces of a regular polygonal fortification, such as surrounds a citadel, or, in other words, a projecting bastion in the centre of the work, with a dend-bastion on either side, connected with it by curtains inclined to each other at a certain angle. This front is connected with the main works by long flanks from the salient angles of the demi-bastions, converging as they approach the works: the whole is surrounded by a ditch which joins the main ditch. Sometimes is ravelin is constructed to defend the curtain of the weakest face of a fortification, and strengthened by a surrounding crown-work. The best example of this kind of work is the double crown-work at Metz, executed by Cormontaingue.

cuted by Cormontaingue.

CROZOFHORA, kro-zo-fo'-ra, in Bot., a gen. of plants
belonging to the nat. ord. Euphorbiacea, and containing one remarkable species, namely, C. tinctoria, a
native of the south of France. This yields, by expression, a green juice, which is converted, by the combined action of ammonia and the air, into the purplish

dve called turnsole.

CRUCIBLE, kru'-se-bl (Ital. crociuolo).—In Chem., crucibles are vessels made of some material capable of resisting a high temperature, used by chemists and metallurgists for fusing metals or chemical compounds. According to the material to be melted and the heat required for fusion, they are made and the heat required for fusion, they are made of platinum, iron, plumbago, porcelain, clay, or lime. Those made of hard refractory clay, such as the Cornish or Hessian crueibles, are most without melting. Plumbago crucibles serve a double purpose, acting not only as vessels, but as reducing agents. Platinum crucibles are used in operations where the results are such as server as the corn where the control of the control agents. Platinum crucibles are used in opera-tions where a clay crucible would be acted on by the fluxes employed. Where a very high temperature is required, as, for instance, in melting platinum, a lime crucible is used. Lately, Messrs, Johnson and Matthey have introduced crucibles made of an alloy of platinum and iridium, which have many advantages over those made of platinum only. (For an account of the manufacture of plumbago crucibles, see Plum-BAGO.)

CRUCIPERE, or BRASSICACEE, kru-sif'-e-re (Lat. crux, cross; fero, I bear), in Bot., the Cruciferous or Cabbage fam., a nat. ord. of dicotyledonous plants in the sub-class Thulamiflora, having the following well-marked characters:—The leaves are alternate, and without stipules. The flowers are usually arranged in racences, are generally without bracts, and mostly yellow or white, seldom purple, sometimes a mixture of these colours. The sepals are four in number. of these colours. The sepals are four in number-deciduous, imbricate, or valvate. The petals are also four, hypogynous, crimiate, alternate with the sepals, iour,—hypogynous, crusiate, alternate with the sepany, and deciduous. The stamens are tetradynamous (six in number, four of which are long and two short). The thalamus is furnished with green glands placed between the stamens and the ovary. The ovary is superior, one-celled, or usually two-celled, in consequence of two parietal placentas meeting in the middle and forming a spurious disseptment or partition. Stigmas two, situated opposite the placentus. The fruit, which is termed a siliqua or silicula, is one-celled, or spuriously two-celled, and one- or many seeded. The seeds are stalked, and have no abunnent of the stalked and have no abunnent of the seeds are stalked, and have no abunnent of the seeds are stalked, and have no abunnent of the seeds are stalked, and have no abunnent of the seeds are stalked, and have no abunnent of the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the seeds are stalked, and have no abunnent or seed as the se it was decreed that all grants of crown lands for more than thirty-one years are void.

Onown-post, iron-poast, in Build., the name given to the vertical trues or post that rises from the horizontal tie-beam of two rafters to the point in which the rafters meet. It is also called a king-post. This formation is also found in what is called a king-post artition, in which the vertical timbers between the joists at the top and bottom of the partition are joists at the top and bottom of the partition are stated, and have no albument ing of a spurious disseptment or partition. Stigmas two, situated opposite the placents. The fruit, which is termed a siliqua or silicula, is one-tied, and one- or many seeded. The seeds are stalked, and have no albument in order is one of the most natural known, and is minerally European. There are 195 genera, consistence in which the rafters which bear of a bottom of the partition are initially further are principally best baccous plants. If ordinary care be observed, they are not likely to be confounded with plants of any

other order except Copportance. The cruciferous flowers may, however, be always distinguished from those of the latter order by their stamens, which, though always tetradynamous, are never raised above the corolls upon a lengthened thalamus or stalk. The general properties of the Crucifero are almost as definite as the botanical characters. The possession of anticorbutic and stimulant properties, combined with an aorid flavour, may be said to constitute a universal character. The puncency of cruciferous plants depends on a volatile oil composed of carbon, hydrogen, nitrogen, exygen, and sulphur. An oil expressed from the seeds is one of the most important products. None of the plants of the order, with one or two doubtful exceptions, are poisonous; many of them are esculent exgetables. The disagreeable odour emitted by them which they contain. (See Brassica, Crambr, Mastratum, Sinapis.)

ORECIFICION, kru-se-fix'-zhun (Lat. crux, a cross, and facio, in make), was one of the most ancient modes of inflicting the punishment of death. At first, probably, it was inflicted by merely fastening the victim to a tree and leaving him thus to perish of want, or to be devoured by wild beasts. Afterwards crosses, or cross pieces of wood, in various forms, came to be used. The usual forms of cross were that resembling the letter X, commonly called the St. Andrew's cross; that in the form of the letter T, consisting of an upright piece of timber with a transverse piece on the top; and the let-in cross, in which the transverse piece of timber was let into the upright, but at some distance from the top, somewhat in this form †. The cross was used as an instrument of punishment by almost all the nations of antiquity,—the Greeks, Romans, Carthaginians, Jews, Syrians, Persians, &c. Its use was abolished throughout the Roman world by Constantine, and since that time it has gone out of use. Among the Carthaginians, crucifixion was inflicted on all traks of individuals, but among the Romans it was confined to slaves and the vilest malefactors. Among the latter the culprit was scourged prior to crucifixion, and was also forced to carry his cross to the place of execution. The sufferer was usually attached to the cross by means of nails driven through his hands and feet, but sometimes he was fastened with ropes. In order to hasten death, the legs were frequently broken, or the body pierced with a spear or other sharp instrument, otherwise the sufferer often lived for days

CRUSADES, kru-saids' (Lat. crux, a cross), in the history of Europe, is the mane given to certain religious wars carried on for the space of two centuries, between the Christian nations of the West and the Mohammedans, for the possession of Palestine. They received their name from the Christians engaged in them having adopted the sign of the cross. As long as the caliphs of Bagdad and their successors, the Fatimites of Egypt, were in possession of the Holy Land, the Christians had full liberty to visit the succedplaces; but after the conquest of Palestine by the Turks, the pilgrims were subjected to cruel treatment, and Europe was filled with their complaints. At length, Peter of Amiens, known as Peter the Hermit, who had visited the Holy Land and witnessed the cruelties perpetrated by the Turks, set out on a pilgrimage through Europe, everywhere inflaming the minds of the people With accounts of what he had seen, and producing the most extraordinary excitement. The pope, Torban II., was not slow in taking advantage of this state of things, and, in 1095, summoned two councils, at which the war was agreed upon, and the like of August, 1096, was fixed for the departure of the army. The first army consisted of about 40,000 men, chiefly Franchmen, Normans, Dutch, Germans, and Italians, but totally undisciplined. They marched through Hungary and Servia, where many of them perished, and the rest were totally defeuted and almost annibilated by the Turks, et Nicres, in Bithynia. It was succeeded, however, by a well-disciplined army of about 600,000 strong, comprising many of the mommand of Godfrey of Bouillon, duke of Lorraine.

They marched into Asia and took Nices, and afterwards Antioch and Bdesse. At length, on the little of July, 1999, after a siege of about six weeks, they obtained possession of Jerusalem, and Godfrey of Bouillon was chosen king. For nearly half a century the conquerors not only maintained their position, but greatly extended their territories, till 1144, when the city of Edesse was taken by the emir of Mosul. A second crusade was preached by St. Bernard, abbt of Clairyan; and two immense armies, estimated to-Scientific transact was pleased by the contract was the contract of a million of men, were raised, under the command of Courad III., emperor of Garmany, and Louis VII., king of France. Through the many, and Louis VII., king of France. Through the treachery, however, of the Greek emperor, Manuel Comnenus, this vast army was all but destroyed by the Turks, and, after an unsuccessful attempt to reduce Damascus, the residue had to make their way back to Burope. The news of the capture of Jerusalem by Saladin (1187), and the fall of the Christian kingdom of Palestine, brought about the Third Crusade. The leaders of this new expedition were Frederick Barbarossa, emperor of Germany, Philip Augustus, king of France, and Richard Cœur-de-Lion, king of England. Barbarossa first took the field in 1189, and defeated the sultan at Iconium; but, in approaching Syria, he was seized with a fever, and died in 1199. Richard and Philip arrived in Syria some months later with a great army, and were joined by the army of Barbarossa. After a lengthened siege they obtained possession of the city of Acre; but Philip soon afterwards returned to France, and Richard concluded a peace with Saladin, in terms of which the Christians of the West were to be allowed to make pilgrimages to Jeruthe Turks, and, after an unsuccessful attempt to reduce with Saindin, in terms of which the Christians of the West were to be allowed to make pilgrimages to Jerusalem without molestation. The Fourth Crusade was intended, like the others, for the conquest of the Holy Land; but, instead of that, it directed its efforts against the Greek empire. Assembling at Venice in 1203, the doge of that city induced them to take the terms of Tares in Disputsion and Source to take the town of Zara, in Dalmatia, and afterwards they took up the cause of Alexius, whose father, Isaac Augelos, had been driven from the Greek throne by his own brother. They took Constantinople, and, after elevating to the throne several princes successively, they at length elevated to it their own chief, Baldwin, count of Flanders, giving him a fourth part of the empire, and dividing the rest among themselves. He and his successors held the empire of the East for upwards of half a century. The Fifth Crusade commenced by the march of a body of troops, under the command of Andrew II. of Hungary, against the Turks, in 1217. After a series of successes in Palestine and Egypt, they suffered a severe reverse before Cairo, and were obliged to sue for leave to return home in 1221. Five years later. K ederick II. of Germany put himself at the head of a considerable army, and set out for the conquest of the Holy Land. The expedition was successful, and Frederick, after receiving from the sultan possession of Jerusalem, and being crowned king, returned home in 1229. Jerusalem and Palestine having again fallen into the hands of the Turks in 1224. the Sixth Crusade was undertaken by Louis IX. of France in 1249. He marched into Egypt, took Damietta; but was afterwards defeated, the greater part of his army cut off, and himself taken prisoner. He obtained his liberty and that of his followers on agreeing to pay a heavy ransom, and then returned home.
Louis, however, did not give up the idea of reconquering the Holy Land, and a few years later he originated
the Seventh and last Crusade against the Holy Land. He died at Tunis, on his way to Palestine, and the command of the expedition devolved upon Edward, prince of England, afterwards Edward I. He marched into Palestine, took the town of Nazareth, but effected nothing further of consequence, and soon after returned Acre and a few other towns still remeined to home. nome. Acre and a lew other towns said aminos to the Christians, and were defended for some time by the Templars and other military knights; but at length Acre capitulated in 1291, and the other towns soon after followed its example. How far the crusades have been of advantage or otherwise to the subsequent progress of Europe, is a question which has given rise to much discussion. They were undoubtedly carried on at an enormous expense of human life, and, in the end, produced no material result, while, during their continuance, they necessarily retarded all progress in

## Crusos, Accademia della

Crystallography

the peaceful pursuits of the arts or manufactures; but on the other hand, we believe that they have a recised a most beneficial influence upon the civilization of Burope. The various nations of Europe were united together in one common cause, and taught to know and sympathize with each other; they were brought into contact with two new civilizations,—the Greek and the Saracenic, each more advanced and refined than their own; and commercial enterprise received from the crusades its first and its greatest stimulus.

CRUSCA, ACCADRMIA DELLA, kroos ka äk-ka-dai'. ms-a del'-la (Ital., the academy of the bran or chaff) was the name of one of the earliest, and one of the most celebrated of the societies of modern Europe. founded at Florence in 1582, chiefly through the exertions of the poet Antonio Francesco Grazzini, and was so called from its chief object being to sift or purify the national language. The great work of the academy was the "Vocabolario degli Accademici della Crusca" (or Dictionary of the Italian Language), which was first published at Venice in 1612, and has since gone through numerous editions, being still regarded as the standard authority on the Italian language. This society has recently been incorporated with two other societies, under the name of the Royal Florentine Academy.

CRUST OF THE EARTH. (See GEOLOGY.)
CRUST OF THE EARTH. (See GEOLOGY.)
CRUST OEA, krus-fai'-she-a (Lat. crusta, a hard shell),
a class of articulated animals whose external covering is less solid than that of the majority of testaccous mollusca, but much firmer and harder than the skin of the naked mollusca. This tegumentary skeleton may be regarded as a kind of epidermis, for beneath it is found a membrane like the true skin of higher animals At certain times this solid envelope detaches itself and falls off, as the epidermis of reptiles separates itself from their bodies. With the crawfish this shell-shedding, or ecdysis, as it is called, is preceded by a few days sickness and fasting, and at that time the carapage, or upper shell, becomes loosened from the corium to which it is attached. The corium begins forthwith to secrete a new shell, which, at first soft and mem-branous, becomes gradually harder and harder, and is at last calcareous. When all connection is broken off, the animal sets about freeing itself of the incumbrance It rubs its legs one against the other, and finally throws itself upon its back, and in that situation begins to swell out and shake itself, till it tears the membrane that attaches the carapace to the abdomen. greatest difficulty occurs in freeing the extremities, nor could they be extricated at all, did not the old shell split longitudinally. The entire process is completed in half an hour; but it takes from twenty hours to three days for the conversion of the soft and membranous integuments into a firm case similar to that lately abandoned. While this transformation is taking place, the muscles of the animal are flaccid, and the flesh altogether unfit to be caten. An exception to this rule, however, would seem to occur in the case of the land crab; for, according to all that has been written on the subject, the latter animal is never so delicious

Sa during the moulting period.

CHYPT, kript (Gr. kruptein, to conceal), a low chamber under a charch or cathedral, with a vaulted roof, the groined arches of which spring from short but massive columns. Sometimes the crypt extends under the entire church, as at Canterbury cathedral; but they are generally of much smaller dimensions. Divine service was formerly performed in them, and they were also used as places of burial.

CRYPTOGRAPHY. (See SECRET WRITING.)

CRYSTALLINE LENS, kris'-tal-line (Lat. orystallus, &

CRYSTALIANE LENS, krist-tail-time (Lat. crystalius, a crystal; lens), in Anat., is the lens of the eye, a lentiform pellucid substance, inclosed in a membranous capsule, and situated in a depression in the anterior part of the vitreous humour. (See EYE.)

CRYSTALIZATION, kris-till-ti-zai's-ham, in Chem., crystallization may be defined as the spontaneous assumption of well-defined geometrical forms by hodies in passing from the fluid or seriform state to the rollid coefficient. Rodges not causalle of assuming the solid condition. Bodies not capable of assuming the crystalline form are termed amorphous or colloid; those which form crystals, orystolloid. When a substance crystallizes in two distinct forms, which cannot be derived from the same original, it is said to be dimorphous to the control of th

phous. Sulphur, for instance, will crystallize in ce-tahedra or prismatic crystals. Some substances are even trimorphous. Sulphate of nickel crystallizes in ishedra or prismatic crystals. Some substances are even trimorphous. Sulphate of nickel crystallizes in right rhombic prisms, square-based octabedra, and obique rhombic prisms, according to the temperature at the time of evaporation. Bodias crystallizing in similar forms are called isome-pase. The alumn and fluor spar; carbon, gold, copper, and their compounds; the potassium compounds of chlorine, iodine, bromine, and fluorine, form isomorphous groups. Crystallization may be effected in several ways,—by evaporation, by sublimation, by fusion, or by slow electrical action. It sometimes happens that precipitates are thrown down in a crystalline form; thus, when tartaric acid is added to a solution of potash, the tartrate of potash added to a solution of potash, the tartrate of potash falls down in minute crystals. Crystallization by evaporation is effected either by allowing a hot saturated solution of the salt to cool gradually or by spontaneous evaporation. In the former case the masses of crystals are small and confused. Where single perfect crystals are required, the method of crystal-feeding invented by Leblane must be resorted to. A small but perfect crystal is first obtained by one of the methods meationed, and placed in a cold concentrated but not saturated obtained by the subtraction of the subtraction. rated solution of the substance in question, after which the crystal is turned regularly twice every day, taking care to expose a fresh surface each time until the crystal has reached the desired size. As the solution becomes weaker, it should be replaced by a fresh quantity of the original strength. Great care must be taken not to use a saturated solution, otherwise fresh crystals will form in the vessel and on the original crystal. A glass plate may be used to lay the crystal on in the solution, and a pair of horn or box-wood tweezers are better than the fingers for turning it. By these means crystals of enormous size may be made. The solution should, as much as possible, be kept at the same temperature, and the crystal should be turned very regularly. Crystallization by fusion is resorted to in the case of metals and other insoluble substances. The metal or other pody is melted in a ladle or cruthe metal or other body is incited in a ladie of era-cible, and allowed to cool until the top crust is solid; it is then pierced with an iron rod, and the melted substance not yet solidified is allowed to run out. Fine masses of crystals of bismuth and sulphur may be obtained in this way. Many salts do not appear to be capable of crystallizing without holding a certain portion of water in combination, termed water of crystallization. Thus ordinary carbonate of soda has ten equivalents of water united with it. Some crystals part with this water very easily, losing their crystalline form and falling to powder merely by exposure to the atmosphere. Such salts are called *efforescent*, in contradistinction to those which absorb water from the atmosphere, which are termed deliquescent. Many salts have the property of crystallizing without water of crystallization; others, again, crystallize in different forms, according to the number of equivalents of water they contain. Biborate of soda, or borax, for instance, crystallizes in prisms or octahedra, according as it contains ten or five atoms of water of crystallization. The forms which crystals assume are also influenced by the purity of the solution from which they are crystallized; for instance, iodide of potassium assumes a prismatic form when crystallized from a neutral solution, but if from one containing carbonate of potash, the resulting crystals are cubical. As to the orce causing crystallization we as yet know but little; all we know at present is, that electricity and light both accelerate crystallization. If a weak voltage current be passed through a solution of silies, it will gra-dually crystallize round the wires; and if campbor be exposed to the light, crystals will form thicker on the most illuminated side.

CRYSTALLOGRAPHY, kris-tal-log'-grit-fe (Lat. crystal-CRYSTALLOGAPHY, krus-fall-log-gride (Lat. crystalus, a crystal; Gr. graphs, writing). — Although the forms of crystals appear to be infinite, yet, upon carefully considering their axes, angles, faces, and edges; they are found to fall into six well-defined groups, which are distinguished from each other by the relative positions and lengths of their axes. These six groups are again subdivided into divisions according to the averagement of their are with carnet to their averagement of their planes with respect to their averagement of their spaces. arrangement of their planes with respect to their axes.
The subject of crystallography is a very difficult one, and only to be learnt by means of an extensive series

of figures or models. It will therefore be necessary to treat the matter somewhat cursorily, referring the student to several standard works upon the subject. The six crystalline systems mentioned are:—1. Regular. The cube, octahedron, and rhombic dodecahedron are the principal members of this system. 2. Square prissatic, in which two of the axes only are equal, all three being rectangular. 3. Right prismatic, in which all the axes are expend and all rectangular. It may perhaps assist the memory if it is borne in mind that means of the above systems the whole of the axes are rectangular, while in the following three the axes are rectangular, while in the following three the axes are rectangular, while in the following three the axes are all inclined to each other. 4. Rhombohadral, in which the three axes are equal but not rectangular. 5. Oblique prismatic, one axis rectangular to two, but all means of the store are sare equal but not rectangular. 5. Oblique prismatic, one axis rectangular to two, but all means of the store are sure shade off gradually into each other. Thus, the cube, by being slightly increased on one of its faces, becomes a square prism: and the aquare prism; by having one of its sides slightly enlarged, becomes a right prism. Many forms are derived from each other by having slices removed from their angles or edges. Thus the octahedron may be modified into a cube by having its angles gradually sliced away, and into the rhombic dodecahedron by having its edges treated in the same manner. A few turnips or potatoes and a sharp knife will afford the student much information in this way. Thus alum, which crystallizes as an octahedron, is often found erystallized with its edges or angles sliced away, and approaching the form of one or other of the forms mentioned. (See also Isomorphism, and Follmore of the subject in Odline's (Remister, part I

Odling's Chemistry, part 1.

CUBE, kube (Gr. kubes, a die), in Geom., is a solid body terminated by six square equal faces, and eccupying among bodies a place analogous to that of the square among surfaces. It is also called the hexabedron, by reason of its possessing six sides. One of the most celebrated problems in the history of geometrical science is the duplication of the cube, i.e. the construction of a cube which shall have twice the volume of a given cube. In the time of Plato, it was a constant subject of controversy with geometers, who, however, tailed to solve the problem, because the straight line and circle, which were the only lines admitted into their calculations, are not sufficient for

the cubation of solids.

OUBE ROOT is a number or quantity which, if multiplied into itself, and then again by the product, produces the cube; or, when twice multiplied into itself, produces the number or quantity of which it is the root. Thus 5 is the cube root of 125, because

5×5=25×5=125.

Cubers. Cubers. Columbus. (See Cubers.)

Ousir, ku-bit (Inc. cubitus), a measure of length employed by the ancients, and more especially by the Hebrews. It was originally the distance from the elbow to the tip of the middle finger. According to some authorities, there were two cubits in use by the Jews,—the sacred and the common cubit. The former was twenty-one inches long and the latter eighteen sinches. Calmet, however, states his belief that the second, or shorter cubit, was not introduced until after the Babylonian captivity. Hence Ezckiel's precaution (Ezck, zl. 5) in speaking of the cubit as a cubit and a hand-breadth. The exact length of the cubit is not known; it has been stated to be 1 foot 9585 inches, and a hand-breadth 3684 inches, in the tables of measure affixed to several versions of the authorized Bible.

CTCRING-STOOL. (See DUCKING-STOOL.)

Oucnon, kook-oo (Lat. osculus, Fr. coscout), (Cusulus canorus).—This bird, which derives its mane from the peculiar sound of its note, is very widthy diffused. It is found in India and in Africa, and migrates northward in summer, even to Lapland and Kamtohaths. It makes its appearance amougst us in April, and disappears again by about the middle of August. It would seem that love is a passion that occupies very little of the cuckoo's consideration. There is no pairing or continued attachment between the male and female, and the latter generally, if not always, lays her eggs in the nest of some other smaller bird, leaving their hatching and future maintenance to fate. The gratitude of the foster child is of a piece with its parent's heartlessness. Mr. Selby asserts that, when

hatched, the young cuckoo has between its shoulders a depression in which it lodges any burden it wishes to carry to the edge of the nest for ejectment; that, at the expiration of twelve days, the hollow is filled up, and that, should the proper occupants of the nest chance to remain till then, the young cuckoo no more molests them. The hedge-sparrow, the pied wagtail, and the yellowbammer, are the birds commonly selected by the cuckoo for imposition. In the early part of the



CUCKOO.

summer of 1828, a cuckoo, having previously turned out the eggs from a water wagtail's nest, which was built in a small hole in a garden-wall at Arbury (the seat of Francis Newdegate, Esq.), deposited her own egg in their place. When the egg was hatched, the young intruder was fed by the water wartails till he became too bulky for his confined and narrow quarters, and in a fidgety, fit fell to the ground. In this predicament he was found by the gardener, who picked him up and put him into a wire eage, which was placed on the top of a wall not far from the place of his birth. Instead, however, of its foster parent the wagtail coming to feed it, there appeared at its prison-lars a friendly bedge-sparrow, who, day after day and at very fre-quent intervals, continued to bring it food, until it was dent intervals, continued to be set at berty. Bishop Stanley relates ar instance of an unfiedged cuckoo being placed in the same cage with a young thrush. The cuckoo was either too idle or unable to feed itself: so the good-natured thrush kindly performed the operation for him. One day a tempting worm was offered at the wires, and at once the thrush went to it. Whether its original intention was to give it to its patient can never be known; if so, however, the sleek plump thing hanging in the thrush's very beak was too great a temptation: it swallowed it. It seemed that the cuckoo had made sure that the worm was coming up to him, and when he discovered his error he hopped ficreely down, and, with one blow of its cruel besk, took one of the thrush's eyes out. Even in this maimed condition the patient nurse continued to wait on its tyrant patient, and never ceased to do so till the cuckoo was hig enough to shift for itself. The gilded cuckeo (Cuculus auratus) is an inhabitant of the Cape of Good Hope, and extremely common in Caffaria. It is a very beautiful bird, the chief of the plumage being brilliant green with golden reflections. It is about seven inches long. Like the common cuckoo, it deposits its egg in the nests of other birds, and, unless Vaillant was mistaken, in a way that puts aside the notion that the hen-cuckoo lays them where they are to be hatched by another bird. While out shooting with his man Kloac, he brought down a golden cuckoo with one of the eggs of its species, and evidently freshly lain, in its throat; and it then occurred to him that his attendant had frequently brought him a bird of this kind, with the exclamation, "This one dropped an egg as she fell from the tree." Later in the day another cuckoo was shot by Vaillant, with an egg in its gullet. "I was convinced from this circumstance," writes the sporting naturalist, "that the female cuckoo deposite

### Cuckoo-Flower

her egg in the next of snother bird by conveying it thither in her beak." Besides those noticed, there is susser in ner near. Heades those noticed, there is the spotted outloo (Oxylophus glandarius), an inhabit-sate of the north of Europe; the oriental anckoo (Eu-dynamys crientalis), found in the East Indies; and the yellow-billed American cuckoo (Coccysus americanus), likewise called the cow-bird and the rain-crow.

CUCKOO-FLOWER. (See CARDAMINE.)

CUCHOO-PINT. (See ARUM.)
CUCUMBER. (See CUCUMES.)
CUCUMBER, ku-kw'-mis, in Bot., a gen. of plants be-

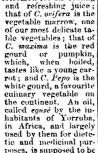


CUCHMBER.

longing to the nat. ord. Cucurbitacea. The fruit of C. sativus is the conmoncucumber, and that of C. Melo the melon. The fruits of the spe cies C. Hardwickti and Pseudo-colocynthus are said to be powerfully cathartic.

CUCUBBITA, ku-kur'bit-a (Lat. cucurbita), in Bot., the typical gen of the nat. ord. Cucurbitaceæ. The fruits of several species are em-

ployed as articles of food; thus, that of C. Citrulius is the water-melon, so highly esteemed for its cooling





the produce of one or more species of this genus.

CUCURBITACEE, ku-kur-bit-ai'-se-e, in Bot., the Gourd or Cucumber fam., a nat. ord. of dicotyledonous plants in the sub-class Calycifloræ. Upwards of 60 genera have been described, and these include more than 300 species. The plants are natives of hot cli-mates in almost every part of the world; they abound in the East Indies, many occur in Peru and Brazil, a few are found in Europe and North America, and one species only, Bryonia dioica, in the British isles. They are all herbs with tuberous or fibrous roots, which are annual or perennial, and with stems which are generally succeivent, and either prostrate or climbing by means of tendrils. The leaves are rough, alternate, and radiate-veined. The flowers are unisexual, mopercious, or directous. The calyxis monosepalous, and in the female flowers, superior. The corolla is monopetalous, four or live-parted, sometimes fringed, with atrongly-marked reticulated veins, perigynous, and occasionally scarcely distinguishable from the calyx. The male or sterile flower has generally five stamens which are epipetalous, and either distinct, or monadelphous, or triadelphous, the anthers being two-celled namally long and sinuous, rarely straight. Now and then male flowers are found with only two or three then male flowers are found with only two or three stamens. In the fertile or female flower the ovary is inferior, the style is short, and the stigmas are more or less dilated. The fruit is usually a pepo, as in the ounquinder; or rarely a succulent berry, as in the bryony. The seeds are more or less flattened and exhibitions. An acrid, bitter, purgative principle characterizes the plants of this order, and is especially exhibition in the pulp surrounding the seeds. In some sultivated species the acridity is scarcely perceptible, and the fruits are edible. (See CUCUMIS, CUCUMBITA.)

Que, ku, the last words of a speech spoken on the

## Cultivation of the Soil

stage, which the actor who is to answer catches at regards as an intimation to begin. It is also applied to any hint given to an actor on the stage, as to what he has to do or say.

CUIBASS. (See BREASTPLATE.)

CUIBASS. ESPENDENCHARE, COLUMN SERVICE back- and breastplates. We have no cavalry so called in the British army, although the Life Guards and Horse Guards wear cuirasses. The cuirass was ori-ginally formed of thick leather, which was ball proof, —whence its name; but when this material was no longer used, the name was retained, and applied to the metal plates which superseded the leathern armour.

CULDERS, kull-deez, the name given to an ancient religious order of ecclesiastics that existed in Ireland. Scotland, and the northern parts of England. The derivation of the name is uncertain, some tracing it to the Gaelic, others to the Latin. According to Bu-chanau, it is a corruption of cultores Dei, worshippers of God. The time of their first appearance, and the character of their institutions, have been no less matter of dispute than their name. Some date their origin from the middle of the 6th century, and attribute their institution to Columba, who came over from Ireland to the island of Iona, on the west coast of Scotland, where he established a monastery, and from which he sent forth his disciples to diffuse the knowledge of Christianity. Having no correspondence with the see of Rome, they are said to have been free from the corruptions that, at a later period, crept into that church, as saint and relic worship, auricular confession, penance, &c.; and their time for the celebration of Easter differed from that of the Church of Rome. They prosecuted their missionary labours throughout Ireland, Scotland, and the northern parts of England, and established flourishing settlements in various parts, after the model of lone. Many of these were in the form of colleges, where instruction was given to youth. In Scotland their chief sellements were, besides Iona, on the island of St. Serf in Lochleves, at St. Andrews, Dunkeld, Abernethy in Perthasire, Monifeith near Dundee, and Monymusk in Abendeenshire. The Culdees gradually lost their power before the growing influence of the Church of Rome. the crecitor of bishopries under the patronage of the kings of Scotland being a death-blow to their independent existence; and their suppression is generally dated from the end of the 13th century, when the Culdees of St. Andrews made their last attempt at resisting the usurpations of the bishop of that see, though it is generally believed that numbers continued to hold their principles down nearly to the time of the There are others who hold that there is Reformation. There are others who hold that there is no trustworthy evidence of the existence of the Culdeen prior to the middle of the 9th century; that there is no reason to suppose that they differed in any material point of faith, discipline, or ritual from the Church of Rome; and that, in reality, they were a mere collec-tion of monastic institutions in connection with the Catholic hierarchy.

Culex, ku'-leks (Lat., a gnat), in Ent., a gen. of the Diptera or two-winged insects, constituting the Guat fam. They are characterized by their length of probose is and their finely-tutted antenne. (See Guat.) Mosovito.)

CULM, kulm, in Min., a slaty kind of anthracite, occurring in Wales and North Devon. The strate in which it is found are often called the culm measures.

CULMINATION, kul-min-ai'-shun (Lat. culmen, the top of anything).—When any heavenly body is on the meridian, it has then attained the highest point of the daily course, and is therefore said to culminate. The sun culminates at mid-day, the moon at midnight, when it is full moon.

CULTIVATION OF THE SOIL, kul-tiv-ai'-shun, the art of preparing the soil for those particular crops which it is required to bear. The ordinary agricultural implements used for this purpose are the plough, the spade, and the loce. In some modified form these spade, and the loce. space, and the noe. In some modified toric traces instruments have been in use among all nations, at all times. The soil, by their means, is stirred and exposed to the action of the atmosphere, and loosened, so that the roots of plants may make their way more estily

### Culverin

through it. Other objects are also effected by com-plete inversion and careful cultivation of the soil. The piete inversion and carretti duinvatton of the soil. The surface-plants are buried and allowed to decay; water in excess passes through it in wet weather; and in dry seasons more moisture is retained. In dry climates the soil requires to be well ploughed and rolled, but in wet climates these operations must be restricted.

CULVERIN, kul'-ver-in (Fr. coulevrine), the name of a piece of ordnance, used in the 16th and 17th centuries, of great length, and formed to throw a ball to a con-siderable distance. It was 5; inches in the bore, and threw a ball about 18 lbs. in weight. The bore of the demi-converin was 4 inches, and the weight of the ball about 9 lbs. Queen Elizabeth's pocket pistol at Dover Castle is a culverin.

CULVERT, kul'-vert, a barrel-drain of small diameter, or an arched water-course for the conveyance of water

or an arched water-course for the conveyance of water under roads, railways, embaukments, and canals.

CUMINUM, ku-mi-num (Gr. kuminon), in Bot., a gen. of composite plants. C. Cyminum, the cumin, is a dwarf fennel-looking plant, cultivated in the south of Europe and Asia Minor for its fruits, which are hot and aromatic, like those of the caraway and anise.

CUNRIFORM, ku-ne'-e-form (Lat. cuneus, a wedge, and CONEIFORN, EU-ne-cjorm (Lat. caneas, a weige, some form), is the name given to an ancient species of written language found on the monuments of the ancient Assyrian, Babylonian, and Persian empires. It is so called from the letters being composed of parts resembling a wedge, a nail, or an arrow-head. It is found carved in rocks and sculptures, or stamped on bricks and tiles; and is met with on the uncient monuments of Persepolis, and other cities of the Persian empire, among the ruins of Babylon and Nineveh, and even in Egypt. It appears to have been first employed in Assyria and Media, and to have subsequently spread over the whole extent of the Persian empire. are three distinct alphabets or kinds of cuncitorm are three distinct alphabets or kinds of cunciform writing, and which are mostly found together in parallel columns, being translations of each other. The most ancient of these is the Assyrian, which consists of about 400 different characters, and is the one which has given most trouble to philologists, and in which least progress has been made. The second of these is called the Median, which is a modification of the first, and consists of about 100 characters. The most second is the Pareira, which consists of only 30 to 44. recent is the Persian, which consists of only 39 to 44 letters. It is much more refined than the others, and the forms are much less complicated. The letters here are all very distinctly formed, none being at all doubtful, and the words are separated from each other by an oblique stroke. This language is believed to be the original of the modern Persian, and to be nearly allied to the Sanscrit. There is every reason to believe that the employment of the cunciform character originated in Assyria, while the system of writing to which it was adapted was borrowed from Egypt. "The whole adapted was borrowed from Egypt. "The whole structure of the Assyrian graphic system," says Rawlinson, "evidently betrays an Egyptian origin. The alphabet is partly ideographic and partly phonetic, and the phonetic signs are in some cases syllabic, and in others literal. Where a sign represents a syllable, I conjecture that the syllable in question may have been the specific name of the object which the sign was supposed to depict; whilst in cases where a single alphabetical power appertains to the sign, it would seem as if that power had been the dominant sound in the name of the object." Much progress has already been Much progress has already been made in deciphering these ancient records, from which we may expect much light to be thrown on the early history of the world. The first accounts of the cuneiform characters were brought to Europe about the beginning of the 17th century, and some time afterwards imperfect copies of them were published. The first publication of a connected inscription was made by Le-Bruyn at Amsterdam, in 1714; and, subsequently, Niebuhr-published copies of some which he had found at Persepolis and elsewhere, and which were more accurate than any that had appeared before. Still, for accurate than any that has appeared cerore. Stil, for long after this, nothing was done towards the decipher-ing of the language. Many, indeed, were of opinion that they belonged to no language,—that they were mere ornaments carved at the caprice of the archi-tect, or charms, or talismanic signs; while at least one author saw in them only the destructive work of worms. Grotefend, of Hanover, was the first that made any

## Cupressus

progress in the deciphering of these characters, brought the result of his labours before the Acad of Göttingen in 1802. The labours of Grotefend was not followed up by others for the next twenty years but since that time there have been many able an

but since that time there have been many able and active labourers in the field; among whom we may mention Rask, Burnouf, Lassen, Westergaard, Rawlinson, Renau, Norris, Hincks, Oppert.
CUNONIACE, ka-non-e-di-se-e, in Bot., a nat. ord. of dicotyledonous plants in the sub-class Calyeifform. They are nearly allied to the Saxifyagaces, but differ from them in Being trees or ahrubs, with opposite leaves and large interpetiolar stipules. They are natives of South America, the Cape, the East Indies, and Australia. Most of them have astrippent proper-

natives of South America, the Cape, the East Indies, and Australia. Most of them have astringent properties, and some have been used for tanning.

CUPANIA, ku-pai'-ni-a (in honour of Cupani, an Italian monk and botanist), in Bot., a gen. of plants belonging to the nat. ord. Sapindaoca. The species C. sapida flourishes in the West Indies, and is in some respects a valuable and interesting tree. The distilled

respects a valuable and interesting tree. The distilled water of the flowers is used by the negro women as a cosmetic, and the succulent, slightly acid arillus of the seed is cuten for dessert. The fruit containing the seeds is commonly known as the akee-fruit.

CUPEL, ku'-pel (Lat. cupella), in Chem., a small cup made of bone ashes, used for extracting base metals from gold and silver. The compound, on being heated in the cupel, loses the base metals by their becoming exidized, and sinking into the cupel. (See ASSAVING.)

CUPPLICATION, in Chem. (See ASSAVING.)

CUPILITEER, ku-pil-i-fer'-e, in Bot., a name given by some botanists to the Oak or Mastwort order. (See CORYLAGE.)

CUPOLA. (See DOME.)

CUPPING, kup'-ping (from the cup-like form of the glasses employed), in Surg., is the application of cupping-glasses, from which the air has been previously extracted, to the skin, with the view of attracting blood to the part, and, if necessary, abstracting it. Capping was practised by the ancients, and is frequently had recourse to in the present day. In performing the operation, the part is first washed with warm water, in order to promote the flow of blood to it, and then a small bell-shaped glass, from which the air has been partially expelled by holding it for an instant over the flame of a spirit-lamp, is immediately applied to the spot, and the usual amount of pressure on the part being thus diminished, the blood flows towards it, pro-ducing a distension of the blood-vessels and an elevaducing a distension of the blood-vessels and an eleva-tion of the surface. This is called dry cupping, and is frequently of great service in the removal of certain kinds of pain. Several glasses may be used, and usu-ally the operation is repeated five or six times. The glass is readily removed by inserting the nail of a finger between the edge of it and the skin, so as to admit the air. When it is intended to abstract blood, the cupping-glass is removed as soon as the part is sufficiently swellen, and the scarificator applied to it. This instrument contains a number of lancets (usually about ten or twelve), which, by touching a spring, are made to inflict a corresponding number of wounds, the depth of which may be regulated by the operator, Immediately on the wounds being made, the cuppingglass is applied, exhausted as before, and the blood allowed to flow into it until a sufficient quantity has been abstracted. If the blood coagulates, or the glass be full, it should be carefully removed, and the part sponged with warm water, and the glass again applied to it. Cupping is preferable to any other method of blood-letting in many kinds of inflammatory disease.

blood-letting in many kinds of inflammatory disease. Cupressus, ku-pres-sus (Gr. kuo, I produce; parisos, equal; because it bears equal branches), in Bot., the Cypress, a gen. of plants belonging to the nat. ord. Conferce. C. semperoirens is a common timbor-tree in some parts of the Levant. Its dark foliage is particularly impressive when seen near architectural works; and on this account the tree was always planted by the Moors round their splendid; palaces, and by the Romans near their villas. In the burial-grounds of Turkey and Arabis, the tombs of the faithful are generally shaded by the cypress. The timber of this and other species is very durable, and is said to resist the worm. The doors of St. Peter's church at Rome are of cypress-wood, and have hared church at Rome are of cypress-wood, and have lasted

## Cupric Acid

upwards of 1,100 years. It is supposed that the gopher-wood of the Bible was chiefly obtained from species of

this genus.

Offric Acid, ku'-prik, in Chem.—This acid never
When finely-divided occurs in a separate state. When finely divided opper is fused with nitre and hydrate of potash, a country formed, which is an exceedingly unstable sait, easily decomposed with potash, oxygen, and copper.

Cuparn, ku'-prite, in Min., the red oxide of copper, which is also known as octahedral copper-ore, from

the form of its crystals.

CURAÇOA, ku-rā-so', a sweet and agreeable liqueur obtained by digesting orange-peel in sweetened spirits and flavouring with cinnamon and cloves or mace. It is made in great perfection by the Dutch in the islands of Curação, from which it derives its name. The spirits employed in its manufacture are usually reduced to nearly 56 under proof, and each gallon contains about \$\frac{3}{2}\$ lbs. of sugar. Curaços varies in colour, the darker kinds being produced by digesting in it powdered Brazil-wood, and mellowing the colour by caramel or

burnt sugar.

CUBATE, ku'-rait (Lat. cura, care), literally signifies a person, who has the cure of souls, and in this sense it is used in the English Book of Common Prayer. Commonly, however, it is used to denote the lowest degree in the Church of England,—the person who is employed under the spiritual rector or vicar, either as assistant to him in the same church, or else in a chapel-of-ease within the same parish belonging to the mother church. A curate has to be licensed and admitted by the bishop of the diocese, or by an ordinary having episcopal jurisdiction, who also usually appoints the salary; in which case, if he be not paid, the curate has a proper remedy in the ecclesiastical court; but if he he not licensed by the bishop, he only has his remedy at common law. A curate not licensed may be removed at pleasure; but if licensed, he can only be removed by consent of the hishop, or where the rector or vicar does duty himself. A curate having no fixed estate in his curacy, not being instituted and inducted, may be removed at pleasure by the hishop or incumbent, and in such case he is usually termed "stipendiary. Where, however, the profits of a benefice are impropriate, so that both the rector and the vicar are or may be lay, the curate is "perpetual." and not removable, being the clerk employed to officiate by such impro-priators. A curate, before being licensed, must subscribe to the Thirty-nine Articles and the three articles of the 36th canon; must declare his conformity to the united Church of England and Ireland; and must take the oaths of allegiance, supremacy, and canonical obdience. In general, the stipends paid to curates are still miserably small, though they have been much improved by a recent enactment. By 1 & 2 Vict. c. 106, certain rules are leid down for fixing the amount of stipends to be reid to curate a bracker without the print of the certain rules are leid down for fixing the amount of stipend to be reid to curate a bracker without the print of the certain rules are leid down for fixing the amount of the print of stipend to be paid to curates by non-resident incumbents. The lowest stipend is fixed at £30, or the whole value of the living if less than that sum. Where the population amounts to 300, the stipend is to be £100; where 500, £120; where 750, £135; and where 1,000, £150; or the whole value of the living, if less than these sums.

CURATOR, ku-rai'-tor (Lat. curare, to take care), an officer among the ancient Romans, whose duties were very varied. In civil law, a curator was one appointed to administer the estate of any person not legally competent to manage his own property. Every person under age who was not under paternal or domestic rule, was put under the superintendence of a guardian. Up to the age of fourteen in a male minor, and twelve in a female, this guardianship was styled tutelage; from that time to the age of twenty-five it was called curatorship. The tutor, or the first guardian, was the ego of the minor; but the curator was local alter merely the representative of his ward and the ordinary administrator of his rights. Persons who recklessly squandered away their money were placed under the superintendence of a curator. Deaf and dumb persons were also considered to be legally unable to administer their affairs, and were put under similar guardianship. The curator bonorum was a trustee for the administra-tion of the affairs of absent or deceased persons, and also of insolvent debtors. After the time of Augustus 601

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several public officers were appointed who held th title of curator. There were curators of the roads who had the superintendence of the planning and repairing of the roats; the curators of public works, who had the superintendence of the public buildings, theatres, aqueducts, &c.; the curators of the river, who were the conservators of the Tiber. There were also other curators, who had the superintendence of the public games, others who administered the landst the public games; others who administered the landed properly of municipies; and others who distributed corn among the people. In the universities and in learned societies, the officers who have charge of libraries, museums, collections of natural history, &c., are called curators.

CURB-STONE, kerb, the line of stonewerk which borders the footpath of a road. It is generally made of a hard durable stone, such as granite.

CURCUMA, kur-ku'-mā (Arab. curkum), in Bot., a gen. of plants belonging to the nat. ord. Zingibaracca. The dried tubers or rhizomes of C. longa constitute. the turmeric of the shops. Turmeric is extensively cultivated in almost every part of India, being employed as a condiment by the natives. It forms the principal ingredients of curry-powder, giving to that compound its peculiar odour and bright yellow colour. compound its peculiar odour and pright years country it is used for dyeing yellow, and for making turmeric-paper, which is used as a test for free alkalies, being turned by these from a yellow to a reddish-brown colour. As a medicinal agent, turmeric is a mild aromatic. The rhizomes of another species, C. angustifolia, contain much starch, which, when extracted, forms East Indian arrowroot, or curcuma starch.

CURFEW, kur'-few (Fr. couvre feu, cover fire), the ringing of a bell as a signal to the inhabitants to exinguish their fires. This practice originated in England through William the Conqueror, who ordained, under severe penalties, that, upon the ringing of a bell at eight o'clock in the evening, all lights and fires should be put out, and every one should go to bed. The custom of ringing the curiew-bell about eight o'clock is still kept up in many places, though its original sig-nificance is lost. The law by which it was ordered to be rung was repealed by Henry I., in 1100. The practice of putting out fires so early was highly necessary to prevent accidents, at a time when hearths were placed in the middle of the floor, under an opening in the roof to allow the smoke to escape. This hole was covered up when the family retired to bed. A prayerbell is often rung about eight o'clock in some Protestant countries. This custom arose out of the curfew-bell. Pope John XXXIII., fearing the approach of misfortunes, ordered that every one, on hearing the curfew, should repeat three Ave Marias. The practice of ringing the curiew-bell existed on the continent long before the Norman conquest.

CURIA, ku'-re- $\bar{u}$  (Lat.), signifies both a division of the Roman people and the place of assembly for such a division. Each of the three ancient Romulian tribes, the Rannes, Tities, and Luceres, was subdivided into ten curiæ. The plebeians had no connection with the curie, and the clients of the patricisus were members of the curie only in a passive sense: thus the curie alone contained those that were real citizens, and their assembly alone was the legitimate representative of the whole people. Each curia had its own place of worship, which was superintended by a priest, curio, who was assisted by another, called curialis flames. The word curia is also used to designate the place in which the senate held its meetings; as, curia Hostilis, curia Julis

curia Pompeii, &c.

CURIA, in Arch., the building in which the higher council of the state met, in a Greek or Latin city. It is described by Vitravius as being adjacent to the forum. Its form was quadrangular, either equate or oblong. Halfway up each wall there was a projecting shelf, or cornice, to prevent the voice being lost in the height of the building. A sort of religious character was conceived to belong to the senate-house, and there were often statues of the gods placed in it.

were often statues of the gods placed in it.

CURLEW (Numericus arquatus), kur'-lew (Fr. courils
or corticu).—The gen. to which this bird belongs is
characterized by a long, stender, incurred bill, shightly
compressed and furrowed for three-fourths of its entirelength; it has a blunt fip; wings ample; tarsi naked

above the joints. In length the curlew measures about two feet, and, in the case of the male, the whole planage is bright ash-colour, with longitudinal brown passage is origin assistance, with anogradual brown spots on the head and breast; upper mandible blackish brown; lower mandible flesh-colour; iris brown; feet deep ash. The curlew is very common in most parts of Europe, and occurs in parts of Asia. It inhabits the vicinity of waters and marshy wastes, and feeds on earth-worms, alugs, small testaceans, and insects. Its nest, a careless construction of dried grass and leaves, is usually placed among the rushes. Its eggs are large, ever two and a half inches in length, of an olive-green

colour blotched with deep brown.

Chulling, kertling (Teut. krullen), a common sport among all classes, played upon the ice in Scotland. The sport is regulated by certain rules issued by the Caledonia Curling Club, and artificial shallow pieces of water are maintained for the purpose of playing it. The game is played with flat round stones about 9 inches in dismoster, and about 30 to 45 lbs. in weight. Each stone, deameter, and about 30 to 45 108. In weight. Lean stone, of which every player has a pair, has a handle. A piece of ice is chosen, about 35 yards long and 8 or 9 feet broad, which is called the rink. The players choose sides, and points with circles round them, called tees, are marked off at either end. The number of points restrength of the sides play atternately. The principal object of the curler is to drive his stone towards the tee. Much depends upon throwing it with strength, as well as discretion; for it resary which has obtained a favourable place. The is often necessary to drive away the stone of an adgame is generally played with great keenness. It has of late years been introduced into England and Canada.

CURRANTS, kur'-rants (from Corinth, where they were eriginally grown), the dried fruits of a variety of the grape-vine, now extensively cultivated in Zante and several other of the Greek islands. About 20,000 tons of these minute raisins are annually imported into this country. (See VITIS.) The currents of English gar-dens, red, white, and black, are the produce of species

of Ribes (which see).

CURRENCY, kur-rense (from Lat. curro, I flow or ran), in Pol. Ec., denotes the circulating medium of a sountry, that by which sales and purchases are effected without having recourse to barter. Among savage nations various kinds of articles have been used as a Among savage circulating medium; but as nations became more civilised, the precious metals, particularly gold and silver, came generally to be employed. As trade advanced, however, and commercial transactions became large and frequent, metal money was found to be inconve mient, and recourse was had to a paper currency. this country, then, the currency includes not only the coinage of the realm, but Bank of England notes, and even country bank notes, although not a legal tender,— in fact, whatever passes current from hand to hand, without individual signature, as appears on drafts or cheques. Currency differs from money in so far as it is applied only to what passes as money at a particular time and place. A depreciated currency is a currency which is not equal to its nominal value in bullion. In some parts of Germany, the British West Indies, and North America, the term currency is applied to the moneys of account only. For information as to the paper currency of this country, see BANKING.

CURRENTS, kur'-rents (Lat. currere, to run), the name given to water running in any direction, and, in naviparts of the course in which the water in certain parts of the ocean is always moving, with a constant and generally uniform motion and in the same direcop. These currents greatly tend to accelerate or influence. Two different kinds are to be distinguished -the drift current and the stream current The former is produced by winds which are always ing in the same direction, such as the trade winds or by winds which prevail in certain quarters for con-siderable periods; and the latter by causes about which there seems to be no certain and settled opinion at the present time, but which are probably somewhat analogous to those by which wind currents are proseed in the atmosphere. Ocean currents are of great breedth, and in some cases sweep scross from one consinent to another. In the Atlantic Ocean the great equatorial current crosses from the Gulf of Guines to

the east coast of South America, with a breadth vary ing from 175 to 525 miles and a mean velocity of 14 mile per hour. The Gulf Stream runs from the Gulf of Mexico in a north-easterly direction, and is support to reach the shores of the British isles, being about 3,000 miles long, and having an average breadth of 250 miles. Its waters are of a dark blue colour, and can readily be distinguished from the green waters of the Atlantic. Its mean velocity is about three miles per hour. Its velocity and temperature lessen as it approaches the European coast; the latter being 863 off the American coast, and about 72° where it approaches the continent of Europe. Ref. Maury's Physical Geography of the Sea; Investigations of the Winds and Currents of the Sea; and Charts of the Winds and Currents of the Atlantic.

CUBENCOME, kur'-re-koumb (Aug.-Bax.), a scraper used by grooms in dressing horses. A number of notched iron plates are fixed in parallel lines upon a back-piece about four inches square, to which a handle is attached. The notches form a set of rough teeth,

with which the horse is scrubbed or carried.

CURRY POWDER, or PARTE, kur-ree, a compound much used in India and this country for seasoning a great variety of dishes. It is made by mixing together preserved with various spices; such as coriander-seed powder, black and cayenne pepper, ginger, &c.—Ref. Mrs. Beetou's Book of Household Management.

CURSE OF SCOTLAND, kers, a popular term applied to the nine of diamonds in a pack of playing cards. to the nine of diamonds in a pack of playing-cards. The probable origin of the phrase arose out of the hatred entertained by the Scotch against John Dalrymple, earl of Stair, on account of his connection with the massacre of Glencoe, in which every man under seventy years of age was killed, and as large number of women and children died by cold and hunger. By some reports, the order for the massacre was signed on the large of the part of the massacre. was signed on the back of a nine of diamonds card; but the more probable origin of the phrase consists in the fact that the cont-of-arms borne by Dalrymple was "or, on a ground saltire azure, nine lozenges of the field." The resemblance which these nine lozenges bore to the niue of diamonds probably gave the origin to this strange term. On account of the massacre of Glencoe, Dalrymple had to resign office two years later, in 1695.

CURTAIN, kurt'-n (Lat. curtina), in Mil., the name given to that part of the rampart which is built between the bastions, and, consequently, connects their flanks. The curtain is generally defended by a ravelin or redoubt, and other outworks constructed immediately in front of it, to save it from being too much exposed to the direct fire of the enemy, with whom it is an object to effect a breach in it as soon as possible.

CURTESY. TENANT BY THE, ker'-te-se, -An estate by the curtesy of England is that to which a man is by law entitled or, the death of his wife, in the lands and tenements of which she was seised during the marriage in fee simple or fee tail, provided he had issue by her born alive during the marriage, and capable of inherit-ing her estate; in this case he shall, on the death of his wife, hold the lands for his life as tenant by the curtesy of England. If the lands, however, he in gavelkind, the rule is so far different that he shall hold no more than a moiety, and that only while he lives unmarried; and, on the other hand, his title attaches

whether he had issue born or not.

CURVLE CHAIR (kw'-rule).—A state chair among the
ancient Romans, permission to use which was a mark
of honour, and only granted under the Republic to the dictator, consuls, prætors, censors, chief ædiles, the fismen dialis, and those deputed by the dictator to act under himself. In the times of the Empire this honour was granted to others. The magistrates entitled to use this chair were called curale magistrates, and when they went to council the chair was borne on a chariot (currus); whence its name. At first it was only adorned with ivory, but in later times it was overlaid with gold.

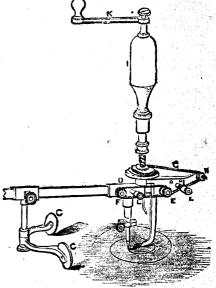
with gold. Curry, kero (Lat. cuspis, a point), in Geom., a line which, running on continually and gradually in all directions, may be cut by a right line in more points than one. The theory of curves forms a very important branch of the higher portion of mathematical science; but only those curves that follow some law

in their change of direction can form the subject of geometrical speculation. The law of the circle is that all portions of the curve are equidistant from one point, called the curve. The invention of defining curves by elgebraic equation is due to Descartes, and the law of a plane curve is generally expressed by an equation between the co-ordinates of any point in it referred to a fixed point. Descartes divided all curves into two classes,—geometrical and mechanical. It is now the outloom to indicate the same distinctions by the terms algebraic and transcendental. The curve is called algebraic when its equation only contains the powers of x and y; and it is called transcendental when the equation contains other functions, such as logarithms of x and y. Algebraic curves are divided into different orders, according to the degree of the equation which expresses the relation between their order, because the equation of a straight line contains no powers or products of the variables x and y. Curves of the second order are those of which the equation rises to two dimensions, and the curves which it includes are the circle, the cllipse, the hyperbola, and the parabola. Out of the infinite number of curves that can be drawn, very few comparatively have received definite names. Besides the four mentioned above, which form the conic sections, there are the semi-cubical parabola, the cissoid of Diocles, the concluid of Nicomedes, the cycloid, the trochoid, the turve of sines, cosines, tangents, &c.; the logarithmic curve and others. Subjoined is a list of the curves that are of usual occurrence: Circle, Ellipse, Hyperbola, Parabola, Semi-cubical Parabola, Cissoid of Diocles, Conchoid of Nicomedes, Triscetrix, Lemniscata, Cycloid, Companion of the Cycloid, Harmonic Curve, Trochoid, Epicrochoid, and Cardioide, Hyporycloid, Epitrochoid, Hyptrechoid, Curves of sines, cosines, tangents, &c.; Exponential or Logarithmic Curve, Spiral of Archimedes, Logarithmie Spiral of Spiral, Litnus Quadratus of Dinostratus, Quadratrix of Tch

CURYES, GEOMETRICAL.—A very valuable instru-ment for the description of geometrical curves has been invented by Mr. Henry Johnson, of Crutched Friars, London. A description of it was read by the Rev. Dr. Booth before the British Association at the Cambridge meeting in the year 1862. The most celebrated geometers of ancient and modern times did not disdain to exercise their ingenuity in the construction of instruments for the graphical description of certain curres by the continuous motion of a tracing-point, and in the actual application of these construc-tions to the manual description of such curres. Nicomedies, the great geometer, who lived two hun-dred years before Christ, invented the curve called the deen years of the calebrated of problem, the depends of the calebrated of problem. the solution of the celebrated old problem, the dupli-cation of the cube. Newton did not think it unworthy his genius to occupy himself in constructing an instrunt for tracing the cissoid by mechanical means. The construction is one of great elegance and simpli-city. In still later times, Sir John Leslie invented a sort of compass to describe mechanically the curve known to mathematicians as the tractrix. Instruments have been invented to describe other geometrical curves; but however ingenious they may be in theory and exact in principle, they are but of little practical value;—they illustrate a principle perhaps, but they do no more. The instrument invented by Mr. Johnson is not a mere philosophical toy, but is designed to meet a requirement and to supply a want that archi-tects and sculptors often experience. An instrument that shall enable architects or others engaged in works of construction to trace with facility the scrolls or volutes of columns, is a help of as much practical value as the tellipic compasses, the protected value as the tellipic compasses, the protector, or the pentagraph. The construction and mode of using the matrament may be thus described :—During the action of the instrument, a bend, a wound round its centre,

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which regulates the tracing-floint, and thus a continuous curve is described, whose nature will decease on the primary conditions of the instrument. The central spindle may be either a cylinder or a cone, whose vertical angle may be made to vary in say, required proportion. In drawing volutes a flat band may be used, wound round the central cylinder, so that each coil shall lap over the preceding one, and the curve so described will be identical with that which would result from a conical spindle being used. But a grooved cone will be found more convenient, or rather a series of grooved conical spindles, each with a different pitch, according to the curves required. A stand with wheels (OC), moving in a curved horizontal bar, supports the arm of the merable radius (B), which slides through a closely-fitting tube (D) on the stand. To the revolving radius B is fixed a vertical coiled spring. Through the cylindrical or conical spindle of the instrument a steel bar is made to pass, round which (held firmly in the hand by the help of a bollow worden or ivory handle (I), through which it passes), the instrument revolves. One end of a band (G) is attached to the central spindle, while the other is attached at L, passing over



the pulley H. Thus the coiling or uncoiling of the band shortens or clongates the horizontal arm, which is always parallel to the radius vector of the curve. The curves may be described expanding outwards from the central point; or, if the curve be commenced at a certain distance from the centre, it may be described in diminishing spirals until the tracing-point reaches the centre. When the difference between sny two coincident radii of the spiral is required to be less than the circumference of the central cylindrical or conical spindle, the result may be effected by using two sets of pulleys (F and E), one set of which (E) is firmly attached to the stand, while the other (F) is movable, and may be attached snywhere to the sliding horizontal arm. The effect produced varies, of course, with the number of pulleys used; for as the vertical axis of the instrument and the point of the horizontal bar, to which motion is communicated, being consected by a band passing over a system of pulleys, the length of the band becomes 2 times the radius of the apiral (t), being the number of pulleys attached to the block through which the horizontal arm passes.

Hence, by increasing t, the number of pairs of pulleys,

Hence, by increasing t, the number of pairs of pulleys, we may diminish in any ratio we please the width of the apirals described by the instrument.—Ref. Givil Engineer and Architect's Journal, vol. xxvi.
CURVEX, or CORVEX, kerv'-et (Ital. corvetta), in horsemanship, an air in which the horse's legs are more raised than in the demivolt; a leap both up and forwards, wherein the horse raises both his forefeet at once, and as his fore-legs are falling he raises his hind-legs as he did his fore; so that his fore-legs are in the air at the same time.

his hind-legs as the did his tore; so the his hind-legs as the same time.

Cuspo-Cuina (kus-ko).—Three different barks pass under this name, one the produce of Cinchona seroisculata, called in Peru red Cusco bark. The accound appears to be the produce of Cinchona substitute. There is also a third, which is perhaps the white Juen. "The alkaloid is procured by the same white Juen." process as is used for cinchonia, which it resembles in its physical qualities; but differs in its chemical habitudes. The taste is more bitter, rather heating, and sub-astringent. It is equally insoluble in water, but easily soluble in alcohol and sulphuric ether. forms with acids, salts, which resemble those of cin-chonia, but have a more bitter taste. The sul-phate conducts itself very singularly."—English Cyclopædia.

CUSCUTACEE, kus-ku-tai'-se-e, in Bot., the Dodder fam., a small nat. ord. of dicotyledonous plants, which is generally regarded as a subdivision of Convolvulaceæ. The plants composing it are distinguished from those of that order by their parasitic habit, by the absence of leaves, by the tube of the corolla being furnished with scales alternating with the segments, and by having a thread-like coiled embryo with almost obsolete cotyledons. They are chiefly natives of temperate climates, and are often very destructive to flax

slover, and other crops.

Cuse, kusp (Lat. cuspis, a point).-When two curves CUSF, Kasp (Lat. cusps, a point).—When two curves touch, or appear to touch each other, and terminate in a point at which they have a common tangent, this point is called the cusp of the curve. Cusps are of two kinds; in one, the tangent lies on one side of both curves, and their convexities are both turned in the same direction towards the tangent; in the other, the tangent hes between the curves, and their convexities are turned towards the tangent in opposite directions. In Arch, the term is applied to the points formed by the meeting of curves in the interior of trefoils, quatre-foils, &c., and in the ornamental stone tracery of church windows these points are often adorned with foliage. The cusp was introduced towards the close of the first period of Gothic architecture, and became a marked feature in the Decorated English and Perpendicular English styles.

CUSPARIA BARR. (See ANGUSTUBA BARK.) CUSTARD-APPLE. (See ANONA.)

OUSTON. (See IMPRISONMENT.)
CUSTOM, kus'-tom (Fr. continue), in the human economy, differs from habit, with which it is usually coupled, in being a frequent repetition of the same act, whereas habit is the effect which such custom produces upon the mind or body. Custom is well said to be "a second nature." It is able to give a man inclinations and capacities altogether different from those howns born with. Acts that are at first most disagreeable to us, or are only accomplished with the utmost difficulty, become, by each repeated act, more easy and pleasant; until at length it may be difficult, or even impossible, for us to retrain from doing them. Physioloimpossible, for us to retrain from doing them. Physiologiats tell us that every act of the body,—nay, even every thought of the mind,—destroys a certain portion of the natter of our body; but, by that very act of destruction, an increased energy or vitality is communicated to the part, by means of which, in a healthy and natural condition, a larger quantity of fresh matter is attracted to the part, and by this means an increased actors of materials is laid up for future use. By this means the arm of the blacksmith acquires strength; the foot of the dancer and the hand of the musician their deriverity. The effect of custom makes but little figure during the vivioity of youth; in middle age it gains ground, and in old age it governs without control. To introduce an active habit, the mere repetition of acts is not sufficient, without length of time. The acts when the temperature to be sentrated from each other by short in.

## Customs Duties

tervals of time, in order to acquire their full force; and the more regular and uniform any operation is, the sooner it becomes habitual. Some pleasures are strengthened by custom, which in other cases begets familiarity and indifference, or even diagnat. Custom blunts the edge of distress and pain; yet the want of anything to which we have been long accustomed is a kind of torture. The power of custom is a happy contrivance for our good. The mind grows fund of these actions which it is accustomed to; and what was at first difficult and disagreeable, becomes at length easy and pleasant; so that even our employments come to be changed into our diversions. It thus also distributes a corresponding amount of pleasure among all ranks of life; for while it renders pleasant the labours of the poor man, the pleasures of the rich man lose their effects from satiety. Satiety is necessary to check exquisite pleasures, which would otherwise engrous the mind and withdraw it from more important pursuits. From a consideration of the effects of custom we can see the importance of that precept which the heathen pullosopher Pythagoras is said to have given to his disciples,—Optimum vitæ genus eligito, nam consustate faciet jucundissimum—" Select that course of life which is the best, and custom will render it the most pleasant."

pleasant."
Cusrom is a rule of civil conduct prescribed to the inhabitants of this kingdom. The lex non scripta, or unwritten law, includes not only general customs, or the common law, properly so called, but also the particular customs of certain parts of the kingdom, and likewise those purticular luws that are by custom observed only in certain courts, jurisdictions, or among particular bodies of men. General customs are the universal rule of the whole kingdom; purticular customs are rupolabily the remains of a multitude of customs are probably the remains of a multitude of local customs, prevailing, some in one part and some in another, over the whole of England while it was broken into distinct dominions, and out of which, after it became a single kingdom, one common law was soliected and made applicable to the realm at large; but for reasons now long forgotten, particular counties, cities, towns, manors, and lordships, were indulged with the privilege of abiding by their own customs, in contradi tinction to the rest of the nation at large, which privilege is in many justances confirmed to them by charter or by several acts of parliament. Such is the custom of guvelkind, borough-English, of manors, of the city of Loudon and other places; and to this head has been referred that branch of the law which comprises certain rules relative to bills of exchange, partnership, and other mercantile matters, and which is generally denominated the custom of merchants. The validity of a custom is determined by the following rules:-1. It must have been used so long that the memory of man runneth not is the contrary. The time of legal memory runneth not is the contrary. refers to so remote a date as the commencement of the refers to so remote a date as the commencement of use reign of King Richard I.; but the observance of a custom for a long time will amount to presumptice proof of its having prevailed during the whole period of legal memory. The principle is materially qualified by the Statute of Limitations of 2 & 3 Will. IV. c. 71. 2. It must have been continued. Any interruption would cause a temporary ceasing; the revival gives it a new beginning, and thereupon it becomes void. 8. It must have been peaceable, and acquiesced in. 4. It must be reasonable, or rather, taken negatively, it must not be unreasonable. 5. It must be convinced in the transition of the unreasonable. 5. It must be convinced with each other. 8. And customs must be convinced with each other. 8. And customs in derogation of the common law roust be construed strictly. 9. No custom

can prevail against an act of parliament.

Customs Duties are duties charged upon commodities on their being imported into, or exported from a country. They appear to have been called customs from being customary payments, or payments which had been in use from time immemorial. They seem to have existed in every commercial country. The trouble and expense necessarily incurred by a government in making provision for the commerce of a country, naturally led to its seeking some means of remuneration, and none seemed at fair and reasonable as that it should fall on the goods or ressels on whose behalf they were incurred. Customs duties were levied in England require to be separated from each other by short in- previously to the Conquest. It is said that Ethelsed

## Customs Duties

established duties on ships and merchandiae, to be paid at Billingsgate, in the port of London, about 979. In at Ritingsgate, in the port of London, about 579. In 1206 the entire customs revenue of England, including that derived from tolls and fairs, amounted to only £4,638. 7s. 34d. At first, the duties were principally raised on wood, skins, and leather, when exported, and seem considered part of the inheritance of the crown. By an act of 3 Edward I, aduly of 6s. 8d. was teried on every sack of wool containing 26 stone; 6s. 8d. on every 300 woolfels (sheep skins); and 13s. 4d. on every ast (12 dozen) of hides. Foreign merchants paid one half more than English merchants; and a subsequent act of the same reign established certain new customs. to be paid by foreign merchants only. The duties of teninage and poundage were customs duties; the for-mer being paid upon all wine imported, at so much a tun; and the latter, a duty on all goods not specified, at so much in the pound of their value. In the 47th year of Edward 111., a duty of 6d. in the pound was imposed upon all goods exported and imported, except wool, woolfels, leather, and wine, which were subject to particular duties. In the 14th of Richard II., this to particular duties. In the 1stn of Archand Al., dust duty was raised to 1s.; but three years afterwards it was again reduced to 6d. In the 2nd of Henry IV. it was raised to 8d., and in the 4th of the same prince, to 1s. From this time to the 9th of William III., this duty of poundage continued at 1s. The duties or subsidy of tonnage and poundage were granted for the defence of the realm and the keeping and safeguard of the seas, and for the intercourse of merchan-dise, and were at first granted only for a fixed period at the beginning of each reign, but afterwards for life. At the time of the Revolution, in 1688, the customs duties amounted to:-£, s. d. 577,507 12 105

1. Tonnage and poundage 2. Duties on wines and vinegar imported 3. Duties on tobacco and sugar imported 4. Duties on French linens, silks, brandies, &c. ...

172,900 11 04

148,861 8 0 93,710 8 1

£992,980 0 0

The last three classes of duties were imposed in 1685. A new subsidy of poundage, an additional is. in the pound, or 5 per cent., was imposed by the 9 & 10 William III., on most imported commodities. Nemerous additions and alterations were subsequently was a subsequently with the contraction. made on the customs duties, and various modes of rating adopted, so that the simplicity of the ancient plan was destroyed, and eadless confusion produced, In order to remedy these inconveniences, Mr. Pitt, in 1767, proposed the abolition of all duties then subsisting, and the aubstitution, in their stead, of one single duty on each article, amounting, as near as possible, to the aggregate of the various duties then payable. These principles were embodied in the act 27 Geo. 111. c. 13, commonly called the Consolidation Act. In 1803 another consolidation of the duties was effected by 43 Geo. III. c. 68; but numerous fresh enactments having impaired the utility of these arrangements, the government was induced, in 1823, to cause the preparation of a new set of laws for the consolidation of the customs. Mr. Descon Hume, then comptroller of the customs in the port of London, and afterwards secretary to the Board of Trade, was appointed by the Treasury to under-take the preparation of a general law, or set of laws, for the consolidation of the customs of the United Kingdom. The bills prepared by him form the subject of cleven acts of 6 Geo. IV. (c. 106 to 0.116 inclusive), and received neces to cree. 1v. (c. 100 to c. 110 inclusive), and received the royal assent in July, 1825. They came into operation on the lat of January, 1826, and, by their great simplicity, proved of immense advantage to commerce. In 1833 eight of Mr. Hume's acts were repealed or altered by 3 & 4 Will. IV. c. 50 to c. 57 inclusive. In 1843, Sir Rahart Paal' mornared considerable in 1842. pealed or attered by 5 & 2 will. IV. 5, 50 to 5, 5 inclusive. In 1842 Sir Robert Peel proposed considerable improvements, which were carried into effect by 5 & 6 Viot. 6, 47, by which the duty was reduced on 75 different by the truth of the control of the contr entarticles, and the number of articles in the tariff reduced to 818. In 1845 Sir Robert Peel effected still Particle improvement by abosehing the duty on 430 other articles. Since that time, almost every year has seen alterations and improvements in our tariff, and in 1853 the duties on 133 articles were entirely re-

# Cutlery

moved. (See Tariff.) In 4763, the set precises of the customs duties was about £2,000,000; in 1792, £4,47,000; in 1815, £11,360,000; in 1850, £21,054,528; in 1840, £23,466,117; and in 1870, £21,449,843. The amount of duties repealed or reduced in 1860 was £2,840,891, and imposed, £577,904. The collection of the customs duties and the enforcement of the laws the customs duties and the entorcement of the laws which relate to navigation and trade are, subject to the control of the lords of the Treasury, in the hands of a board consisting of a chairman, deputy chairman, and four commissioners; with a secretary, assistantsecretary, and a staff of subordinate officers. As nearly one-third of the entire revenue of the country is derived from the customs duties, they are of the utmost importance to our prosperity, and there are many important questions connected with them. The duties should tant questions connected with them. The ditties should in no case be so high as to encourage sungiting, nor, indeed, in most cases, so as to interfere with their consumption; neither should they in general be too low, for then they must be extended over a great number of articles, by which means the expense of collection is largely increased, and the freedom of the trader much interfered with. They should be levied, as much as possible, on articles that do not constitute as much as possible, on articles that do not constitute. necessaries of life, or necessaries of manufacturing industry. Moderate customs duties are among the least objectionable of all taxes, as they interfere little with the operations of the manufacturer or trader, in many cases serving rather as a protection to the for-mer, and are collected at the least possible expense. With one or two exceptions, where the duty is high on certain necessaries of life, there is little to object to in our present system of customs duties. Down to the time of the Revolution, customs duties were charged indiscriminately on commodities whether exported or imported; but, since that time, they have been almost exclusively laid on imported articles, and now are so entirely.

CUSTOS ROTULORUM, kus'-tos rot-u-lor'-um (Lat.), in Law, is a special officer, who is always a justice of quorum, to whom are committed the records or rolls of the general and quarter sessions of the peace of the county for which he is appointed. His nomination is by the royal sign manual, and to him the nomination of the clerk of the peace belongs, an officer who acts as clerk to the court of quarter sessions, and records all their proceedings, and who also takes the custody of such documents as are directed to be deposited with him by statute, or under the standing orders of either house of parliament.

CUTANEOUS DISEASES. (See SKIN, DISEASES OF THE.)

CUTICLE. (See SKIN.)
CUTLASS, kuti-lis (Fr. contelus), in Mil., a broad heavy sword with a basket-hilt of iron, used by sailors in boarding an enemy's vessel. (See BROADSWORD.)

in boarding an enemy's vessel. (See BBOADSWORD.)
CUTLENY, kut'-ler-e (Fr. contellerie), in a general
sense, includes all cutting instruments, such as knives,
forks, seissors, &c. There are three kinds of steel
employed in the manufacture of different articles of
cutlery,—common steel, shear steel, and cast steel. All
edge tools which require to be tenacious without being very hard, are made of shear steel. The best scissors, razors, penknives, &c., are made from cast steel, which razors, penkinyes, &c., are made from cast steel, which is able to take a very fine polish. Common steel is only used in making very common articles of cutlery. In making good table-knives shear steel and cast steel are generally preferred. In the ordinary method of making knives, the blades are cut out of a sheet of steel, and the backs, shoulders, and tange of wrought iron, are attached to the steel blades by welding at the force. The knife is then ground to the proper share iron, are attached to the steel blades by welding at the forge. The kuife is then ground to the proper shape, and the blade polished and hardened. The fork manufacturers as distinct branch of industry, and the manufacturers of table-knives generally buy their forks from the fork-makers ready to be put into their handles. In muking table-knives two men are generally employed; one is called the foreman, or maker, and the other the atricer. Purpose are usually forced by ployed; one is called the foreman, or maker, and the other the striker. Penknives are usually forged by a single hand, with hammer and anvil simply; they are hardened by heating the blades red-bot, and dipping them into water up to the shoulder. Razors are also hardened in the same manner. The grinding and polishing of cutlery are generally performed by machinery. The business of the grinder is divided into

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three processes, grisding, glasing, and polishing. Grinding is performed upon stones of various dimensions, those articles which require temper requiring to be ground on wet stones. Glasing is a process by be ground on wet stones. Obssing is a process by which leastre is given to cutley; it is performed with a glazer, consisting of a circular piece of wood, sometimes covered with leather, or an alloy of lead and tin; it is fixed on an axis, like a grindstone. The polishing process is the last, and is performed on a similar piece of wood covered with buff leather. Only articles of east steel which have been hardened and tempered are subjected to this operation. The manufacture of cutsubjected to this operation. The manufacture of cutlery has been brought to great perfection in Great Britain. The principal manufactories are in London and Sheffield.

Three, kut-ter, a small kind of vessel, rigged somewhat like a sloop, fitted with one mast and a very long bowsprit, the latter of which can be reefed, or taken when it is necessary to use a smaller jib. They are employed by government for the revenue service, as the swiftest and most convenient vessels for chasing smngglers, and for preventing the landing of contraband goods. This term is also applied to small clin-

band goods. This term is also applied to small clincher-built boats, used by the officers of ships, similar in shape to gigs, but with sharper bows, having generally six or eight oars. Eight-oared cutters are now much used in regatta-racing.

Cuttle-Fish (Octopus), kut'-tl fish (Ang.-Sax.), a molluseous animal of the gen. Sepia, ord. Cephalopoda. The body is somewhat oval, but broader at the head than at the extremity, which is obtusely pointed. The head is furnished with eight arms and two feet, the head is furnished with eight arms and two feet, the latter being nearly similar in structure to the arms or tentacula, but considerably longer in their dimensions. A neck divides the head from the body, which is furnished on each side, throughout its entire length, with a narrow fin. The back of the cuttle-fish is strengthened by a calcareous plate, well known as the cuttlefish-bone. This bone was in former times in great repute among apothecaries as an absorbent; but now it is chiefly used in the form of a powder, to polish the softer metals. The term bonc, however, is properlinapplicable to the calcareous shield of the cuttle-fish however, is properly as in its composition it is exactly similar to shell, and consists of various membranes hardened by carbonate of lime, without the smallest mixture of phosphate. This animal is sometimes termed the ink-fish, a name that arises from the circumstance that beneath its throat is a bladder, in which is secreted a fluid black as the blackest ink, and which, when annoyed or pur-sued, it ejects, so staining the water around it, that it is an easy matter for it to escape unperceived. its olour, a circumstance that did not escape the cobservation of Mr. Darwin while at the Cape de Verd Islands. "I was much amused by the various arts to Islands. "I was much amused by the various arts to escape detection practised by one individual, which seemed fully aware that I was watching it. Remaining for a time motionless, it would then stealthily advance an inch or two, like a cat after a mouse, sometimes changing its colour. It thus proceeded till, having gained a deeper part, it darted away, a wing a dusly train of ink to hide the hole into which it had crawled." There is a serious belief among fishermen generally that the larger copbalopoda are highly dangerous, from awisting their arms round swimmers, and thus impeding their motions. "Some of these, particularly those of Sicily, are sometimes caught of an enormous size, with their arms fully as long as an ordinary man's leg; but notwithstanding the marrellous stories related and believed by their captors, we did not hear of any well-authenticated instance of these animals having actu-ally occasioned loss of life."—Swainson's Instincts of Animals.

CETTY STOOL, kut'-te, in the Scotch church, was the stool or seat of repentance on which offenders against chastity had to ait during divine service, professing repentance and receiving the minister's rebukes.

CYANIC ACID, si-dn'-ik, in Chem., C, HNO, or CyO, HO,—When cyanogen is passed through a solution of an alkali, a change takes place similar to that which occurs when chlorine is used in the same manner. Granide and cyanate of the base are produced, the

of oxygen, instead of five, as in the case of chingis scid. There are several more convenient methods of pro-ducing cyanic acid than the one named. One is by heating an intimate mixture of two parts of ferrocyanido heating an intimate mixture of two parts of ferrocyanide of potassium with one of peroxide of manganese, the mass being constantly stirred until it reaches a low red heat. When cool, cyanate of potash may be dissolved out. Cyanic acid is so unstable that it cannot be separated from its compounds by an acid. It is best procured by distilling eganuric acid (which see), a crystalline compound having precisely the same composition, in a sealed tube. It is extremely pungent, very volatile, and acts as a powerful caustic if dropped on the flesh. It cannot be preserved, as it gradually changes into a white glassy mass, destitute of acid properties, insoluble in water, and permanent in air. This body has been named cyamelid, and has exactly the same components as hydrated cyanuric and cyanic acids.

CYANITE, ei'-an-ite (Gr. kuanos, blue), a mineral belonging to the garnet family, occurring in broad prisms in mica and tale schists. Transparent cyanite is often used for sapphire; but it may be known by its inferior hardness.

Interior hardness. CYANOGEN, si-dn'-o-jen (Gr. kuanos, blue, and gennao, I produce), in Chem., symbol Cyor NC<sub>2</sub>, equivalent 28, spec. grav. 1'8064, combining volume 2.—Cyanogen, or bicarbide of nitrogen, is one of the most interesting of the carbon compounds, its discovery by Gay-Lussac in 1814 having thrown considerable light upon two important facts in chemical science,-the existence of compounds acting as elements, and of substances having the same ultimate composition, but different properties. In fact, it was the means of originating new theories with respect to organic bodies generally. eyanogen, signifying blue-producer, was bestowed on this substance in consequence of its forming an essential ingredient in Prussian blue. Cyanogen cannot be formed by the direct union of its elements, but may be obtained by passing nitrogen over a mixture of charcoal and carbonate of potash heated to redness in a porcelain tube. The potash becomes reduced to po-tassium, carbonic oxide escapes, and cyanogen is formed, which unites with the potassium, yielding cyanide of potassium. The reaction that takes place is interesting-

## $KO_{1}CO_{2} + C_{4} + N = K_{1}NC_{2} + 3CO_{2}$

The compounds of cravegen are, however, generally obtained from the ferroevanide of potassium, a salt formed by heating in a covered pot five parts of refuse animal matter, such as hide, hoof, and horn waste, with two parts of potash and iron filings. The mass, when cold, is digested in water, which dissolves out the when cold, is digested in water, which dissolves out the ferrogrande of potassium. Ten parts of this salt, distilled with seven parts of oil of vitriol and five or six parts of water, yield hydrocyanic or prussic acid, which, if saturated with oxide of mercury, furnishes cyanide of mercury. This, on being dried and heated in a retort, furnishes eyanogen. Cyanogen is a colour-In a retort, turnishes evanogen. Cyanogen is a colour-less gas, with a peculiar penetrating odour. It is poisonous in its effects if breathed, and it burns with a beautiful purple flame. It dissolves in one-fourth of its bulk of water, in one-twenty-lifth of sleohol, and may be submitted to a high temperature without de-composition. It is easily liquefied by a pressure of four atmospheres. In the liquid state it is colourless, limpid, and lighter than water. At -3° Fahr, it freezes furnand lighter than water. At -3° Fahr, it freezes, forming a transparent crystalline solid. Cyanogen, which is in itself a compound radicle, has the property of uniting with various elements to form still more complicated radicles. Thus, with iron it forms two compounds,—ferrocyanogen, FeCy,, or Fey, and ferrilyanogen, FeCy, or FeY, and ferrilyanogen; FeCy, or FeY, and ferrilyanogen; with manganese, mangani-cyanogen; with platinum, platino-cyanogen; with palladium, palladio-cyanogen; with iridium, iridio-cyanogen; and with copper, cupro-cyanogen; which all behave as elements, uniting with the metals and forming hydracids with hydrogen. The principal compound of cyanogen is cyanic acid, composed of an equivalent of cyanogen and an equivalent of cyanogen are an equivalent of cyanogen described under the head of Cyanogen Acid. It also forms five other compounds with oxygen. is in itself a compound radicle, has the property of nide and cyanate of the base are produced, the ACID. It also forms five other compounds with oxy-ic acid, however, containing only one equivalent gen, all of which possess previsely the same composition, but differ remarkably in their properties. They are cyannic, cyanilo, fulminuric, fulminic acids, and a body called cyametid. Descriptions of their properties will be found under their respective headings; with nitrogen, cyanogen forms cyanamids, which has been already described. Cyanogen forms with chlorine three compounds, which all have the same ultimate composition, but differ materially in their properties. One of them is gaseous, another liquid, and the third solid. With iodine and bromine it forms solid combinations: with sulburn it forms a it forms solid combinations; with sulphur it forms a compound radicle, sulpho-cyanogen (Scy), which, with hydrogen, forms hydrosulpho-cyanic acid; with selentum a similar compound is formed. The cyanides of the alkalies and earths are soluble; those of the heavy metals mostly insoluble in water. The most impact of the control o portant of these is the cyanide of polassium, which is obtained by heating to redness in an iron crucible eight parts of ferrocyanide of potassium and three of carbonate of soda, until the mixture has ceased to be of a yellow colour, and has given off the last bubble of This salt is made in large quantities for the use of electrotypists and photographers. The former use it as a solvent for gold and silver in electro-plating; the latter to remove the unused iodide of silver from the collodion-plate. Cyanogen is prone to form double salts with the metals. Cyanide of potassium, when added to solutions of the heavy metals, throws down a precipitate, which is soluble in an excess of the precipitant, forming a double eyanide of potassium and the double cyanides are of two classes These those which form salts easily decomposed by hydrochloric acid, such as cyanide of potassium and silver; and those which are not so easily decomposed, such as the cyanides of potassium and iron, of potassium and cobalt, and several others. The salts of the second class are looked upon by chemists as containing the metal united with the cyanogen, forming an organic radicle. This will, perhaps, be better understood by considering the following formula:-

1st class .- Double cyanide of nickel and potassium, NiCy, KCy.

2nd class .- Double cyanide of iron and potassium, or ferrocyanide of potassium

$$2(KCy) + FeCy = K_2 + FeCy_s$$

Cyanide of potassium. Cyanide of iron. Potassium. Ferrocyanugen

In the latter salts the heavy metal is generally masked; thus the iron in ferrocyanide of potassium is not dis-tinguishable by the usual tests for that metal. The whole theory of cyanogen and its compounds is most intricate and cannot be entered into here. Those who wish to pursue the subject further are referred to the discussion of the properties of cyanogen and its com-pounds, in the third volume of Miller's Elements of Chemistry. When binoxide of nitrogen is passed through a solution of hydro-ferrideyanic acid, a decomposition takes place, an equivalent of hydrocyanic acid being replaced by an equivalent of binoxide of nitrogen. The compounds formed by this radicle will be described under the head of Nigro-Prussipes.

CYANOSIS, OF BLUE DISEASE, si-an-o'-sis (Gr. kuanos, blue), is a diseased condition of the system, arising from a malformation of the heart, which, allowing the intermixing of the venous with the arterial blood, in consequence of which the former is not properly oxygenized, and a blueness is imparted to the skin: whence the disease takes ita name. Little can be done towards effectig a cure of this disease; and though it interferes with the functions of the body and produces

general weakness, it does not necessarily destroy life.
CYANURIC ACID, si-du'-u-rik, in Chem.—This acid is
obtained in a variety of ways, which need not be desoribed here. It is deposited from its aqueous solution

scribed here. It is deposited from its aqueous solution in colourless rhombic prisms. It is sparingly soluble in cold water, more freely in bolling alcohol, and still more so in bolling water. It is polymerio with cyanic acid and several other products of cyanogen.

CYCADACUE, si-ki-dai'-se-e, in Bot, the Cycas fam, a nat. ord of dicotyledonous plants, in the sub-class Gynthospermia, consisting of small palm-like nn-branched trees or shrubs, with stems marked by the cars of fallen leaves. In a few species the seed divides in a forked or dichotomous manner. The

leaves are clustered at the summit, are purallel-veined, hard, and usually decimate in tion. The flowers are quite naked, unisers diccious; the male flowers in cone scales, from the under surface of which one-santhers arise; the female, consisting of maked oplaced on the margins of altered leaves, or of or arising from the base of flat scales, or from the under surface of peltate ones. The seeds are hard or suc-culent, with embryos, single or many, in fleshy or mealy albumen. The plants are principally natives of the temperate and tropical parts of America and Asia and are also found occasionally at the Cape of Good Hope, in Madagascar, and Australia. Their stems and seeds yield mucilage and starch. The product known as Japan sago is said to be obtained from a species of the typical gen. Cycas. This sago is not an article of European commerce.

CYCADITES, si'-ka-dites, in Geol., fossil plants of the colite and chalk, apparently allied to the existing Cycadacea. The leaves only are known.

CYCLE, si'-kl (Gr. kuklos, a circle), in Chron, the name given to any period of time, or a certain number of years, in which certain events and phenomena recur at intervals, in the same regular order of auccession. coming exactly to the same point again at the same time, or very nearly so, at the commencement of each cycle. These divisions are antificial or arbitrary, and have been invented to compensate for the impossibility of measuring natural cycles, such as the revolution of the earth round the sun, or that of the moon round the earth, by our divisions and subdivisions of time. An explanation of the most remarkable of these cycles, and those in common use, will be found under their respective names. (See Calippic Cycle, Golden Number, Indiction, Julian Period, Meronic NUMBER, INDICTION, CYCLE, SOLAR CYCLE.)

CYCLOPEADIA. (See ENCYCLOPEDIA.)

CYCLOPEAN ARCHITECTURE, si-klo'-pe-an (Gr. ku-klops, round-eyed, from kuklor, a circle, and ops, an eye-sion applied to any wall that is formed of large, irregular, unhewn stones, piled together without mortar or cement of any kind. Walls of this without mortar or cement of any kind. Walls of this description are to be seen at Tryus, Mycene, and Epirus, in Greece, that were most probably built by the ancient Pelasgi; and similar specimens of building, though not on the same gigantic scale, exist in Italy, Asia Minor, and Peru, as well as in some parts of the British isles; among which may be mentioned the Laws, near Dundee, in Scotland, and the Giant's Sconce, near Coleraine, in Ireland. The name was given to walls of this kind because they were supposed to have been built by the Cyclopes, one-eyed giants, who were the workmen of Vulcan.

CYDONIA, \*\*i-do'-ne-d (so named because a native of Kydon, in the island of Crete), in Bot., the Quince, a gen. of plants belonging

to the nat. ord. Rosaceæ and sub-ord. Pomeæ. C. vulgaris is a deformed low tree, sometimes cultivated for its fruit, which is a pome with a persistent calyx, like the medlar. This fruit is mixed with apples in making pies and tarts, and is much esteemed for the preparation of a kind of marmalade. In the rind of the quince Wohler has tound cenanthic ether, to which its peculiar fra-



which its pecuniar irangrance is due. The seeda contain much mucilage and are occasionally used for preparing bandoline (which see).

CYGNET, (See SWAR.)

CYGNET. (See SWAR.)

CYGNUS, sig/ones (Lut. cygnus, a swan), a constellation in the northern hemisphere, situated between those of Cassiopeis and Lyra. Its brightest star is one of the second magnitude.

CYLINDER, sil/-in-der (Gr. kulinde, I roll), a solid body which has three surfaces, one of which is convex and continuous, and the other two parallel. A right cylinder is one in wifich the line joining the centres of

## Cylinder of a Steam-engine

the limiting ourcles is perpendicular to their plane. All other cylinders are oblique. A right cylinder, taken in this view, may be conceived as described by a rectangular parallelogram, revolving about one of its sides. Criticipies of a Strain-weight is that part of the engine in which the piston works, and from which, by alternately admitting and condensing the steam, all the power, of the machine is derived. The boring of cylinders for steam-engines requires very powerful and securate machinery. The cylinder is cast hollow, and the object of the boring-machine is to produce a true cylinder, with an even surface, so that the piston may fit exactly and work freely. Some machines for this purpose sot horizontally and others vertically, while the unitees receive and advance by the action of some powerful prime mover. This operation is generally repeated three times, in the last of which the greatest powerful prime mover. This operation is generally repeated three times, in the last of which the greatest care is required.
CXMA RECTA, si'-mā rek'-tā (Lat. cyma, a little ahoot,

a branch; recta, right), in Arch., the name given to a moulding which somewhat resembles the letter S, thollow in the upper part and projecting below. When this order is changed, and the projection is above instead of below, the moulding is called cyma reversa. The entire curve which a section of the moulding presents will be found to consist of the conjunction of two parts, each of which is exactly one-fourth of the

circumference of a circle.

CXMATUM, sim-ai'-she-um, the upper part of the cormoe of an entablature (see Cornice, Entabla-TURE); so called because it is generally in the form of the moulding described in the preceding article

CYMBALS, sim'-bale (Lat. cymbalum), musical instruments, the origin of which is very ancient,—indeed, probably more so than that of the tambourine. They were made of sourcous brass or copper, and were very various in form; the difference consisting in the size, the presence or absence of a rim, the depth or shallowness of the bowl, as well as the shape of the handle by which they were held. Modern cymbuls are, parexocllence, military instruments; and, when played with taste, form a very pretty addition to a band. They are instruments of percussion; and, when struck together, produce a loud harsh tone of no fixed pitch. The best cymbals are obtained from China and Turkey; and all the attempts of Europeans to discover the metal of which they are made have hitherto proved abortive. Although best adapted for military bands, modern composers often introduce them in the orchester with the metal of the composers of

tra with very pleasing effects.

Crack, sime (Gr. kuma, a spront), in Bot., a common term for the different kinds of definite inflorescence; that is to say, for every inflorescence formed of a terminal flower, beneath which are lateral branches, each having a terminal flower, and lateral branches again similarly dividing, and so on. The varieties of the cyme will be described under the head of Invic-

RESCENCE.

CYNARA, sin-ai'-ra (from Gr. kuon, a dog, in allusion

to the spines of the involucrum), in Bot., a ger, of plants belonging to the nat. ord. Composita: It includes the artichole and cardoon (which see).

Others, sin'-iks, the name of a sect of ancient phicosphers, whose founder was Antisthenes, a disciple of Sagrites. According to some, the name is derived from the Greek word kuon, a dog, on account of the anaring character of the sect; according to others, is is formed from Cynosarges, the name of the gymnatium in which the founder expounded his system. His debutrines were chiefly confined to morals, and, like most other moral systems, in attempting to re-form certain evil tendencies he fell into their opposite form certain evil tendencies he fell into their opposite extremes,—in avoiding Scylla he fell into Charybdis. The evils resulting from the refinement and luxury of his age having attracted his notice, he attempted to lead men back to their original simplicity of life and manners. He taught that the true dignity of man consists in wisdom, and wisdom in independence of mind; and being by thirth poor, and, consequently, excluded from all political rights, he maintained that this independence or, rather, freedom from all restraint, was to be attained by man rendering his wants as few and to be a transmitted to the compoundance. It differs in occupion at women and or disciple of Scorates, heing Aramania heing his col

# Cyrenalos

the garb and the staff and wallet of a mendicant. is represented as teaching that pais or lawour, and even infamy, is a good, and pleasure, on the contrary, an evil. His doctrine of the supreme good is a life secording to virtue, which consists in action, and rean evil. His doctrine of the supreme good is a superacording to virtue, which consists in action, and requires neither many words nor extensive knowledge. He condemned all civil institutions, despised the fees of kin or country, and saw in wedlock no higher us better end than the propagation of the species. These peculiar views were carried to still greater lengths by his followers. With them philosophy was considered to consist entirely in practice, in the srt of living, or in the attainment of a pleasant life, which consisted solely in dispensing with all, even the most simple and necessary wants. The sage, they maintained, ought to be free from all outward influences, and superior to all the accidents of chance or change. Most of the arts and sciences, as they do not tend to make men virtuous, but sometimes, on the contrary, interfere with the attainment of it, are unprofitable and permicious. The most famous of the Cynics besides their founder were Diogenes of Simope, Crates of Thebes with his wife Hipparchia, and Menippus. At length the sect became so disgusting from their impudence, dirty habits, and profligacy, that they ceased to be rethe sect became so disgusting from their imputence, dirty habits, and profligacy, that they ceased to be regarded with any respect, and passed into obscurity. The great merit of this system is that it paved the way for the establishment of Stoicism, by which it was succeeded and superseded.—Ref. Ritter's Geschichte der Philosophie; Hegel's Geschichte der Philosophie; Lewes's History of Philosophy.

CYPERACEE, si-per-ai-se-e, in Rot., the Sedge fam.

s nat, ord, of monocotyledonous plants in the sub-class Glumacea, consisting of grass-like or rush-like herbs, natives of all parts of the world, and found especially in marshes, ditches, and the neighbourhood of running streams. The stems are solid, often angular, and are without joints or diaphragms. The leaves form entire without joints or disphragms. The leaves form entire or closed tubular sheaths round the stem. The flowers are spiked, imbricated, and either perfect or unisexual, each arising from the axil, of from one to three bracts or glumes. The lowermost glumes are frequently empty, or without flowers in their axils. There is seldou a visible perianth; but it exists sometimes in the female flowers as a tube, or as a whorl of hypogynous scales or bristles. Stamens bypogynous, 1commonly 3; anthers 2-celled, innate; ovary 1-celled, superior, with one erect ovule; fruit indebiscent, with a single seed having fleshy or mealy albumen, inclosing a lenticular embryo. Although closely allied to the Graminacea (grasses), the plants of this order are of little use to man, their seeds being deficient in those nutritive qualities which render the seeds of the cerepis so valuable. The rhizomes, tubers, or corms, of some species of the typical genus Cyperus were formerly employed in medicine as aromatic tonics and astriugents. When boiled or rousted, some of these corms are edible.

Ox-Rais, se-prai' (Nor.).—It is a rule with respect to all charities, that the intention of the donor, so far as it is practicable and legal, shall be strictly observed, the law not permitting it to be varied without necessity, even by consent of his heir. But where it is incapable of heine literally actions. of being literally acted upon, or its literal performance would be unreasonable, a decree will be made by the court of Chancery for its execution cy-près, that is, in some method conformable to the general object, and adhering as closely as possible to the specific design of the donor.

CYPSELA, sip'-se-lä, in Bot., the name given to a kind of fruit which occurs in all plants of the order Com-positae. It differs in nothing essential from the achanium (which see), except in being inferior and of

ought to control circumstances, and not to be controlled by thems. According to him, the sum of life was made up of pleasure and pain; the one to be sought after as good, the other to be avoided as evil. The ohief good, according to him, was the greatest number of agreeable perceptions; and the true philosopher was one who actively and successfully pursued pleasure. He taught that man ought to devote himself entirely to the enjoyment of the present moment, either regretting the past nor caring for the futures. Every act was regarded to be in itself morally indifferent, and only to be viewed as it produced pleasure or pain to the individual. The chief successors of Aristippus were Theodorus, Hegesias, and Annicerie, each of whom became the founder of a sect known respectively as the Theodoran, Hogesian, and Annicerian ively as the Theodoran, Hegesian, and Annicerian schools. As Cynicism was the forerunner of Stoicism,

schools. As Cynicism was the forerunner of Stoicism, so Cyrenaism, which constitutes its chief merit.—Ref. Ritter's Geschichte der Philosophie; Hegel's Geschichte der Philosophie; Lewc's History of Philosophie.

CYRILLACKER, si-ri-lai-se-e (in honour of Cyrillo, a Neapolitan botanist), in Bot., the Cyrillo fam., a small nat. ord. of dicotyledonous plants in the sub-class Thalamifora, consisting of evergreen shrubs with alternate extipulate leaves, nearly related to Olsacca, but distinguished by their imbricate petals, which are altogether free from haviness on the inside, and by the stamens being all fertile, and, if equal in number the stamens being all fertile, and, if equal in number to the petals, alternate with them. They are natives of North America; but nothing is known of their

properties and uses.

Crst, sist (Gr. kustis, a bladder), in Anat., is applied to the urinary bladder, gall-bladder, and similar vessels in the human body; but it is also applied to mornid growths within the body, having the form of a bag or

bladder, and inclosing morbid matter.

bladder, and inclosing morbid matter.

CYPINACHES, si-in-ai-se-s, in Bot., the Cistus-rape fam., a small nat. ord. of dicotyledonous plants in the sub-class Monochlamydex, consisting of root-parasites of a fungoid texture. The flowers are perfect or unisexual, and either solitary and sessile or clustered at the top of a sealy stem. Calyx 3—6-parted; anthers sessile, opening longitudinally; ovary 1-celled, inferior; cyclic every numerous; placentas parietal; fruit 1-celled, with numerous seeds imbedded in pulp. The plants of this order occur in the south of Europe and Africa, growing as parasites upon the roots of Cistus, upon fleshy Euphorbiucea, and upon other succulent plants. Some have astringent properties; as Cytinus Hypocistus, from which an extract is made in the south of Europe, and there used in diarrhoss and for arresting his morrhage. Hydnora africana has a putrid animal odour; but when rousted, it is caten by the natives of Africa.

CYTISUS, si'-tis-us, in Bot., a gen. of leguminous trees and shrubs, of which the laburnums are well-known and universally admired examples. The timber of the tree-laburnum (C. alpinus) is much prized by cabinet-makers and turners for its hardness, beauty of wine and depublish.

grain, and durability.

CYTTABIA, sit-tai-re-a, in Bot., a gen. of fungi. C. Darwinii and Berteroi are employed for food; the former in Terra del Fuego and the latter in Chili.

Czan, zar, a title of the emperor of Russia. Up to the 16th century, the principal rulers of the Russian provinces were called grand-dukes. Several adopted the title czar; but Ivan II. Wassiljewitch the Cruel, was the first who was solemnly crowned czar. After him, all the monarchs of Russia called themselves czars of Moscow; and after the conquest of Little Russia and Smolensk, they took the title of czars of all the Russias. The rank of imperial dignity was not granted to the czar by the European powers until the reign of Peter I. He called himself Imperator, and the empress Imperatizs. The ordinary title of the empress is czarina. The emperor Paul I., in 1799, gave the title Cæsarewitch to his second son. All the sons of the czar are

which is the same as the Latin, is evidently de from the Greek (Δ), by rounding off the right angle into a curve. The Hebrew deleta signifi-door, and in its earlier form it bore a manifest r blance to the door or opening of a tent. D is the dial letter of the order of dentals or paleto-der and readily interchanges with those of the same of as German tief, deep; traum, dream; du, thou; de thine. It also readily interchanges with the letter 3; Greek dapsiles, Latin lapsilis: Latin canda, Spanish cola. (See L.) The Latin D is frequently changed into a. s. or ss in German; as duo, cwei, two; decem, zan, ten, D also seems to manifest a kind of affinity for the letter n, and is drawn by it into a number of words to which it does not radically belong; as Latin tener, English tender. Di followed by a vowel is sometimes changed into j; as, diurnal, journal. D, or as is was formerly written, 10, stands for 500. In Music, D is the second note of the diatonic scale, answering to the re of the Italians.

DAB, did (Pleuronectes limanda), a common flat flat well known in the London market. Its average size is eight or nine inches in length, and six or aven in breadth. Its upper side is pale brown, and its under-parts white. It is usually caught with plaice and flounders. The three spring months constitute its "season."

DABCHICK, dib'-tshik, or little grebe (Podiceps minor), a small bird nine or ten inches in length, comminor), a small ord time or ten manes in length, some monly found about lakes and fishpoulds. It is an ex-ceedingly active swimmer, and dives with great ease. It progresses under water with considerable rapidity, with the aid of both wings and feet. The larger greates do not appear to use their wings in this way. (See

DA CAPO, or D.C., da-ka'-po (Ital.), in Mus., an ex-pression placed at the end of a piece, to indicate that the performer is to return to, and end with the first

Dack, dais (Du. daas) (Cyprinus leuciscus), a small, fish found in clear and quiet streams. Its head is small, muzzle pointed; back flightly elevated, and tail slightly



forked. The scales of the dace are rather small. It is gregarious. The food is worms and other soft animal substances. April and May are the prime times to fish for dace.

DACHYDIUM, dă-krid'-i-um (Gr.dukru, a tear), in Bot., a gen. of plants belonging to the nat. ord. Turquez, or Yew family. It includes several valuable timber trees; as, the Huon pine of Australia (D. Frunklinti), the Kakaterro of New Zealand (D. taxifolium), and the

Dimon pine (D. cupressinum).

Dictyl, ddk'-til (Gr. daktulos, a finger), in Greek and Latin poetry, is the name of a foot or measure consisting of a long and two short syllables,—as in calmina, omnibus. It is so called from its resemblance to a finger, which has a long and two short joints. Dactylic verses are hexameters which end in a dactyl instead of a spondee

instead of a spondee.

Dactilis, ddk'-til-is (Gr. daktulos, a finger), in Rot, a gen. of Grasses. The species D. caspitosa, is the tusse-grass of the Falkland Islands, which forms an excellent kind of fodder for cattle. It is now grown to some extent in Shetland and other parts of Britain.

Dactilology, dik-til-ol'-o-je (Gr. daktulos, a finger, and a of discoursing a mode of discoursing the state of the s

D is the fourth letter of our, as well as of the Latin, Greek, and Hebrew alphabets. The Greek name is delta, the Hebrew daleth; and our form of the letter, of a cube,—whence its name. In the internal decora-

tion of buildings, the term is eften applied to the boarding or panelling which covers the lower part of the walls of a room, finished by the skirring-board below, and an impost, or small projecting cornice, called a chair-rail, above. The dado of a room, including its three parts, is about three feet in height. It is commonly found in houses of the 17th and 18th centuries; but it is not much used in the present day.

Danus, in Chem., a hydrocarbon obtained by heating oil of turpentine with quicklime. It is a liquid oil, boiling at 273° Fahr. It is also called comphilene and

camphene.

DERION. (See DEMON.)

DAM, dig (Fr. dague), the name of a hand-gun or pistol, invented in the early part of the 16th century, resembling the demi-haque and pistol in form, but having the butt straight and flat, and terminating in a square surface instead of being curved and flushed by a rounded knob like that of the pistol. The butt, in-deed, was very much like the haudle of a Turkish yata-ghan; or old-fashioned dagger, square and broad where the little finger grasps the hilt, and from this resem-blance the weapon probably derives its name. The Italian for wood-kuife or dagger, is pistolese, which seems to corroborate the supposition that these weapons derived their names from their resemblance to daggers, or from bearing the same relation to a musket that a

dagger bears to a sword.

Dagger, dig-ger (Fr. dagne), a weapon consisting of a short blade, sometimes broad, two-edged, and tapering to a point, and sometimes triangular in form, like a bayonet, set in a hilt, with a loop of wire projecting from it on either side, to receive the pressure of the hand in making a thrust. It was sometimes used as a nand in maxing a turust. It was sometimes used as a wespon of defence, particularly in duelling and single combat, being used in the left hand to parry the thrusts of a rapier. In the days of chivalry, the knight gene-rally carried a long sharp dager in his girdle, called a misericorde, with which be dispatched his adversary when he had unborsed him, if he refused to yield, by

stabbing him in the throat.

Dagon, dai gon (Heb. dag, a fish), the name of a celebrated god of the Philistines, worshipped at Ashdod, Gaza, and elsewhere. Difference of opinion exists as to the form of this idol; but the most general opinion is, that it had the head and hands of a man, while in the lower part it resembled a fish. The form of the figure alludes to the maritime position and piscatorial purshits of the Philistines. Some derive the name from the Hebrew dagan, corp, and believe him to have been the god of agriculture. In 1 Samuelv., we have an ac-count of the fall and destruction of this idol before the

ark of the Lord.

DAGUERRKOTYPE PROCESS, di-qair'-o-tipe, a process of photography invented by M. Daguerre, an eminent Rrench chemist, by which images are impressed on a silver plate. A perfectly polished silver plate is exposed in the dark to the vapours of iodine and bromine, by which means a mixture of iodide and bromide of silver, exquisitely sensitive to light, is obtained. The plate is then exposed to the action of the image formed by light in the camera obscura, for a period varying from a few seconds to several minutes, according to the intensity of the light. A latent impression is formed on the film of bromo-icdide of silver, giving this substance the property of combining with the vapour of mercury in those parts where the light has struck. This latent impression is brought out or developed by being exposed for a few seconds to the vapour of mercury in a heated box. On withdrawing the plate, the mercury will be found to have fixed itself to the silver in exact proportion to the effect of the light on the different portions of the image, the deposit being white and brilliant on the lightest portions, more or less grey on those parts constituting the half-tones, and being absent altogether in the deep shadows. It is then washed with a weak solution of hyposulphite of soda, which dissolves out the bromo-lodide of silver, which has remained unaitered by the light. The last process consists in laying on a fine film of metallic gold, by pouring over the plate a solution of the double hypographite of sode and gold or as it is commonly portions of the image, the deposit being white and sulphite of sods and gold, or sel d'or, as it is commonly termed. There are few questions which have given rise to greater controversies amongst chemists than the nature of the daguerreotype image, many supposing

it to be mercury only, others thinking that it is a smalgam of mercury and silver. B is unfortenest that the quantity of material formed is so very minute that it becomes impossible to subject it it analysis Daguerreotypes have been almost entirely superspects reguerreorypes have seen atmost entirely superagided by photographs on paper and glass. The absence of any unpleasant metallic gloss, and the easier multipli-cation of the latter, to say nothing of the process being much simpler, have almost entirely excluded deguerreorypes from public favour. It often happens that damagractures become that daguerrectypes become covered with a crust of sulphide of silver, from the action of the sulphur compounds contained in the coal and gas burnt in our In such cases the daguerreotype should be houses. In such cases the daguerreotype snows we washed, by a competent photographer, with a weak solution of cyanide of potassium, until the objection. able film is removed, when the image will be found to be restored to its pristine brilliancy. The facts just mentioned dictate the necessity of preserving daguer rectypes in air-tight cases, as much as possible away from the mantel-piece, where they are most usually

DARLGREN Gun, dal'-gren, a gun of heavy calibre, invented by and named after an officer belonging to the United States navy. In form it is somewhat similar to the Armstrong gun, although it does not possess the symmetry, power, and lightness of that weapon. The breech is extremely strong, being very much thicker than the breech of an ordinary cannon; while the part between the fruncious and the muzzle is lighter, and contains less metal than a common gun of the same calibre. It is much used in the United States navy, and highly prized by the Americans; but it is inferior to Sir W. Armstrong's beautiful weapon in every respect. It fires shells as well as solid shots.

Darn, due-re', is the name of the ecclesinatical sove-reign of Jupan, who has his capital at Minko.

DAIRY, dair'-e (Aug.-Sax.), a term usually applied to all that is connected with milk and its management on a farm. It is also applied to the place where the milk is kept and converted into butter or cheese. In the successful management of the dairy very much depends upon the quality of the cows and the food with which they are supplied. The construction of the house where the milk is stored, &c., is of the highest importance. It should be situated on a dry spot, somewhat elevated, having, if possible, a northern exposure. high roof and free ventilation are necessary; and the proximity to pig-sties, sewers, or offensive smells, must be avoided. Coolness is essential during the summer, be avoided. Coolness is executed uning the amount and an equable temperature in the winter. As the milk suffers from being agitated or too much cooled before it is set for the croam to rise, the cowhouse should be as near as possible to the dairy. The milk before it is set for the cross to the dairy. The milk should be as near as possible to the dairy. The milk should be brought direct from the cows, without being the context air, if possible. No substances expected to the outer air, if possible. No substances except milk, butter, and newly-made cheese, should ever be allowed to come into a dairy. The floor and shelves, which are generally of stone or slate, should be carefully washed every day, and any spilled milk should be removed immediately. Scrupplous cleanli-ness, indeed, is the first rule in all dairies. After being brought into the dairy, the milk is run into shallow dishes, made of carthenware or oak, lined with lead. The layer of milk run into each vessel should be shallow, in order to promote the formation of cream. The cream removed at the first skimming is the richest and best, For the methods employed in the dairy for converting milk into cheese and butter, see the articles under these heads. In London and other large towns the cows are kept by the dairymen tied in their stalls. They are seldom kept longer than twelve months, being disposed of as soon as their supply of milk does not equal the cost of their feeding.

DAIS, dais (Fr. dais).—In the common acceptation of the word, when we speak of the dais, we mean the resiced flooring at the upper end of a hall, on which the high table stands, and where the most distinguished nigh table stands, and where the most distinguished guests are seated, or the platform on which a throng, or chair of honour, is placed. This also seems to be the meaning of the term when it occurs in the works of old English poets and prose writers. In France it means the campy erected over a raised platform occurred by the campy erected over a raised platform occurred by the campy erected over a raised platform occurred. pied by the sovereign at any reception or public err-monial, as well as the platform itself; and the canopy

narried over the hest or saored wafer, when the priests are bearing it to the hedside of a dying man, is so called. Originally it most probably neant the canopy only, under which a throne, situr, fout, or statue was placed; being next applied to the elavated platform on which such things were placed, and afterwards to any piece of flooring that was higher than the rest.

Dairs. (See Britzs.)

Dairs (See Britzs.)

Dairs (See Britzs.)

Dairs (See Britzs.)

Statis (See Britzs.)

Dairs (See Britzs.) carried over the hest or sacred wafer, when the priests

enined.

DALMATIC, dal-mat'-ik, is the name of a long white gown with sleeves, formerly worn by the Dalmatiaus, and, since the time of Pope Sylvester I., by the deacons of the Boman Catholic church, over the alba and stola. It was formerly also worn by the German

and stoka. It was formerly also worn by the German emperor at the time of his coronation.

Dam, ddm (Germ. dumm), a construction of stone, wood, or earth, erected for the purpose of keeping back a current of water, with the object of giving power by increased head, or for holding back supplies of water for flooding lands, or for rendering the stream above the dam navigable by increased depth. The first hillders of days were the basers whose confirst builders of dams were the beavers, whose constructions of states, clay, and earth, whose constructions of states, clay, and earth, attest their wonderful sagacity. Perhaps the most magnificent work of this kind is that described by Minard. It is in the province of Alicante, in Spain, between two steep mountains, which are in close proximity to each other. The height of this dam is 18th feet; its length 2724 feet; its thickness at top 694 feet. It was erected in 1594, and is used for collecting water to be used for irrigating the vineyards in the neighbourhood.-Ref. Minard's Cours de Construction des Ouvrages qui établissent la Navigation des Rivières et des Canaux, Liège,

DAM, in Law, a boundary or confinement; as to dam up, or dam out, infra damnum suum, within the bounds or limits of a man's own property or jurisdiction.—Bract., ib. 2, c. 37.

DAMAGE, dam'dj (Ang.-Nor.), in Law, signifies, enherally, any hurt or hindrance which a man receives in his estate; but in a particular sense, it is applied to what the jurors are to inquire of and bring in when any action passeth for the plaintiff. (Co. Litt., 257.) Damages are a species of property acquired and lost by suit and judgment of law, and are given to a man by a jury, as a compensation and satisfaction for some injury sustained; as for hattery, false imprisonment slander, trespass, and otherwise. (2 Bl. Com., 438.) (As to the quantum of damages which will carry costs, see Cosrs.) see Costs.)

DANAGE-FEASANT, or FAISANT, dām'-āj faiz'-ānt (Ang.-Nor.), in Liw, is where a stranger's beasts are found in another person's ground without his leave or license (and without the fault of the possessor of the license (and without the fault of the possessor or the close, which may happen from his not repairing his fences in cases where he is bound by law to fence), and there doing damage, by feeding, or otherwise, to the grass, corn, woods, or the like. (2 Danu. Abr. 364; 3 Bl. Com. 7.)

DAMASK, däm'-āsk (from Damascus, where it was originally made), a woven fabric, in which, by particular arrangements of the loom, figures of flowers, basis and others not of a geometrical form are pro-

fraits, and others not of a geometrical form, are pro-duced. The art of damask-weaving remained for a long time a mystery confined to a few places; but since the invention of the Jacquard loom it is extensively employed where stuffs used for dress or house-furnishing require ornament. The flowered ribbons of Coventry and the costly silks and satins of Lyons and Spitalfields are specimens of damack manufacture. The chief seat of the trade is Dunfermline, in Scotland; it is also largely made in England, Ireland, Belgium, Saxony,

Bilesia, and Austria.

Damaserening, or Damascens-work (düm-üs-DAMASCER-WORK (dim-ga-best-ing (Fr. damaguiner), the art of producing a watered or wavy appearance on steel sword-blades, armour, &c., or of inlaying and encrusting steel with gold and silver: This art was originally practised at Damascus, and was introduced into Europe in the 12th

century by the Crusaders, who frequently be Damasone blades, which were celebrated for their ticity, temper, and keepness, with them on their or from the Holy Land. Vertous methods of damase ing were practised; but the most common seem to been those of welding two different kinds of steel and iron, together, or of cutting lines on the sur-face of the steel and filling them with gold or silver, which was either forced into the incised lines and brought on a level with the surface of the steel, or mained in relief above it. When the former med was used, a light pattern, generally in wavy lines, was produced on a dark ground, or vice versa, and the inneproduced on a dark ground, or vec verse, and the unc-tion of the metals caused the pattern to run through the entire thickness of the blade, so that it could not be obliterated even by grinding. The damaskeened steel armour and works of art in this style of the 15th and 16th centuries came chiefly from Misan and Venice. The most beautiful piece of work of this kind that now exists is the shield made by Benvenuto Cellini, which is in the possession of her Majesty. It was formerly the property of Francis I. of France, and was given by him to Henry VIII.

DAME, daim (Lat. domina, a mistress), formerly a title of honour given to high-born ladies, in order to distinguish them from the wives of citizens and the ordinary guish them from the wives of citizens and the ordinary commonalty. The prefix ma was given to the word dame on account of the great courtesy shown to ladies of high rank. Madame, "my lady," was applied to a lady of title; and in France, Notre Dame, our Lady, was applied to the Virgin Mary as a term of veneration and homage. The word dame, in England, is not much used, but in general signifies a married woman. The French word madame is shortened into madam, and

is used in a similar sense.

is used in a similar sense.

Dammara, dim'nm'ri, in Bot., a gen. of coniferens trees, including two remarkable species. D. australia, the kawrie or cowdie pino of New Zealand, furnishes excellent timber for musts and spars, and also yields a gum-resin, which is now largely imported into this country under the names of Australian copal, kawrie gum, and Australian dammar. It is chiefly used in the preparation of varnishes. D. orientalis yields a somewhat similar gum-resin, which is known as Indian demonstration.

Dampen, dam'-per, a term applied to several mechan-ical contrivances. The damper of a furnace or fire-place is a door or valve, which, by rising, falling, sliding, or otherwise, lessens the passage for air, and thus damps or checks the intensity of the combus-The damper of a pianoforte also acts as a check : it is in the form of a small lever, which presses against a string soon after it has begun to sound, and thus stops the vibration. An apparatus which communicates dampness is also called a damper: thus, damping-machines have been invented for the purpose of moistening postage and other stamps,

DANKER, a sub-ord, of Ferns. (See FILICES.) DANCE OF DEATH, dause, a term applied to a certain class of allegorical representations generally dating about the 14th century, and illustrative of the power of death over the human race. In the dark ages of monkish bigotry and superstition, the people were led into a belief that the fear of death was acceptable to the Creator. Hence they seem to have derived one of their principal gratifications in contemplating this necessary termination of humanity, surrounded by ideas of the most horrible and disgusting nature. The representations of skulls and bones on the tombstones of the present day are the remnants of the customs of that time. Gradually, the feeling of the people towards death changed, until it was represented under simpler and more majestic forms. During this transition-state, one of the most favourite emblems of mortality was the Dance of Death. It was a drains performed in or near churches, and consisted of short dialogues be-tween Death and twenty-four or more followers. It originated in Germany, but was afterwards greatly in vogue in France, where it was called la Danse Monders, from St. Macarius, an Egyptian annehorite. Shortly after its introduction into France, pictorial representations of the dance began to be made, and remains of these are to be found and on the in many allege on the these are to be found not only in many places on the continent, but also in Great Britain. The drams was altogether laid aside in the middle of the 18th century,

## Dancette

Daniel, Book of

and the pictures held the chief place of importance. Hitherto they had been placed only in the quiet cloisters of the convents, but now they were exhibited in public, and soon lost their original character. The protection of Death denoing with his victims was departed from by Holbein, who, availing himself of the subject, produced fifty-three distinct subjects for engraving, which he called "Imagines Mortis." The originals are at \$1. Petersburg. \*\*Hef.\* Holbein's Dance of Death, in Bohn's Riestrated Library.

Distourns diseased one of the eight neculiar forms

DANGETTS, din-set, one of the eight peculiar forms of partition-lines recognized by English heralds. It is a zignag line, the indentations of which are of a great

e, and limited to three in number.

DANCING, dan'-ring (Ger. tanzen), is the art of moving in measured steps, or adapting the movements of the body to the sounds of music. There is no account of the origin of the practice of dancing among mankind. It is found to exist among all nations, even the most rude and barbarous. Among the Jews, dancing seems to have formed part of the religious worship on some coexions, as is evident from some passages in the Pasims. The ancient Greeks made the art of dancing into a system, by which the different passions could be powerfully expressed. Homer mentions dancing at entertainments, and Aristotle ranks dancing with poetry. The Spartans compelled their children to practise dancing from the age of five: they were led by men, and sang hymns and songs as they danced. by men, and saig hymne and cope as they danced.
The Pyrinic dance was danced by the Spartan youths;
it was expressive of a sham fight. There were three
kinds of dances among the ancients: military dances,
intended to make the body robust, active, and well
disposed for all the exercises of war; domestic dances,
which had for their objects or was all the descriptions. which had for their object an agreeable and innocent relaxation and amusement; and mediatorial dances, which were in use in explations and sacrifices. The early Christians danced at their religious assemblies, although there is no mention of the practice in the New Testament. At the present day, duncing is a favourite amusement as a social custom and healthful

DANCING MANIA, an epidemic disorder among sus-ceptible subjects, in which imitation is brought about under high excitement. It is closely allied to hysteria, and principally occurs among persons who are desirous of notoriety or sympathy. During the Middle Ages, epidemics of this class were common in Germany; and in Italy they were ascribed to the bite of the tarantula spider. Towards the close of the 14th century, a number of men and women appeared at Air-la-Chapelle, on the festival of St. John, dancing and screaming in a frantic manner in the streets. Many foamed at the mouth, and danced till they fell down insensible; others dashed their brains out against the walls. While dancing, they were unsusceptible of outward impres sions, but were haunted by visions. The epidemic spread over the Low Countries, and bands of wretched The epidemic ignorant people traversed the country, and, excited by wild music, danced themselves into convulsions, singing all the time in derision of the priests. At the beginning of the 17th century, St. Vitus's dance, as it was then called, was on the decline, and it is now only heard of in isolated cases.

DANDRAION. (See TARAXCUM.)
DANDRAION. (See TARAXCUM.)
DANEGELT, dain'-gelt (Sux. Dane, and gelt, money),
was an ancient annual tax of the Anglo-Saxons, levied
for the purpose of defending their coasts against the Danes.

Dane-Lage, or Dane-Law, dain'-law.—After King at Ethandune, a treaty was entered into by which the Thrandune, a treaty was entered into by which the Danes were bound to eracuate the whole kingdom of Wesser, from Somerset to Kent. They were, however, allowed to occupy the greater portion of the cast const of England, including the whole of Northumbria. The portion of territory which they occupied was called Dane-lagh, or Dane-law; because they were not governed by English, but by Danish law. The treaty was concluded in 878 a.D., and was held in force till the Norman conclude.

the Morman conquiest. Many sale was need in lorestill the Morman conquiest. May yet, is the twenty-seventh in order of the books of the Old Testament, and is the work of the author whose name it bears, at that time acceptive in Babylon, to which country he was taken

when very young. Being of noble, if not of royal extraction, and a youth of great promise, he was brought into the king's court, and instructed in the lan-guage and sciences of the Chaldeans, and subsequently guage and sciences of the Unantesns, and subsequently rose to very great eminence. The book which bests his name is partly historical and partly prophetloal. The first six chapters are historical, and speak of Daniel in the third person; the last six contain visious, which Daniel relates in the first person. In the first six Chapter we have about the contain visious, six chapters we have recorded a variety of events which occurred in the reigns of Nebuchaduezzar, Belshazzar, and Darius; and, in particular, the second chapter contains Nebuchadnezzar's prophetic dream concerning the four great successive monarchies, and the ever-lasting kingdom of the Messiah, which dream God enabled Daniel to interpret. In the last six chapters we have a series of prophecies, revealed at different times, and extending from the days of Daniel to the general resurrection. The Assyrian, the Persian, the Grecian, and the Ruman amiles, we all particularly assembled and the Roman empires, are all particularly described under appropriate characters; and it is expressly declared that the last of them was to be divided into ten lesser kingdoms; the time at which Christ was to appear is precisely fixed; the rise and fall of Anti-christ, and the duration of his power, are exactly determined; and the future restoration of the Jews, the victory of Christ over all his enemies, and the universal prevalence of true religion, are distinctly foretold as being to precede the consummation of all things. The book abounds with the most exalted sentiments of piety and devout gratitude; its style is simple, clear, and concise; and many of its prophecies are delivered in terms so plain and circumstantial, that many have been led to deny their authenticity, and to maintain they were written after the events had taken place. Porphyry, in the 3rd century, affirmed that the book was composed as recently as the time of Antiochus Epiphanes, and that therefore it narrated only past events; and he has had many followers in more recent times, and even in the present day. The arguments, however, advanced against the authenticity or genuineness of the book are of the most weak and frivolous character. "If the book had been written after the events, as these assert, it must have been written in Palestine; in which case the writer would not have been acquainted with the names of the Chaldean offices, which are in the Zendic, Phelvic, and Parsic languages; and he would not have been acquainted with the views peculiar to the Magians, much less would he have ventured to make use of them; he would not have applied to the lack king of the Chaldeans the name Belshazzar, which is unknown to historians; he would not have covered the walls of the royal supper-hall with plaster, but rather with costly wainscot; he not have known that Xerxes had excited even the West (the Carthaginians); neither would he have been acquainted with the history of Alexander, of Egypt, and of Syria (Dan. xi. 2, vii. 6, viii. 5, xi. 3), he would not have mentioned the third expedition of he would not have mentioned the tuird expedition of anticohus Epiphanes a second time (xi. 40) out of its natural order; neither would he have written occasionally so enigmatically, nor have used two dialects, but he would carefully have avoided whatever would have thrown difficulties in the way of his reader; he would not have specified the year and day of his visions, which could afford him no advantage in the transformation of history into a prophage; he would have inserted. ation of history into prophecy; he would have inserted in his visions less of Alexander and more respecting the Maccabees; and he would not have said, in viii. 15, 27, xii. 4, 8, that these predictions were unintelligible until they should be accomplished, and that the prophecy, x. I, was understood by Daniel, such observa-tions being inconsistent with the supposed transform-ation."—(Jahn's Introduction to the Old Testament.) In short, the book is exactly such as one living at the time, and in the circumstances of Daniel, would have written, and is as different as possible from anything that we could conceive written during the Maccabeau period. The very accuracy of these prophecies, which is objected to their authenticity, is what might be expected from a man of his character, as a man accustomed to the study of political affairs, and who would therefore take a more particular view of what was revealed to him. Finally, we have the testimony of Christ himself as to the real and prophetic character

Willes.

# Danish Language and Literature

of the bock when he says, "When ye, therefore, shall see the abomination of desolation epokes of by Daviel the prophet, stand in the holy place, &c. [Matt. xxiv. 15].—Ref. Hongstenberg, Die Authentie, des Daviel; Horne's Introduction to the Old Testament; Jahn's

ditto.

Danish Language was originally a dislect of the so-called Old Norse, which, on account of the political superiority of the Danies over the other Scandinavians, was also called the "Done Norse the other Scandinavians, was also called the "Done Norse the other Scandinavians, was also called the "Done Norse the Old Norse; the Danish language. The Danish is the most changed of the languages derived from the Old Norse; the Swedish and Norwegian being less so, and the Icelandic least of all. The political union of the Danes with the Angio-Saxons under Cauute the Great, and the intercourse between the two nations that resulted thereform, had a considerable influence upon the Danish from, had a considerable influence upon the Danish language, to which the other branches of the Old Norsetongue were not subjected. Much more important and considerable was the influence exerted upon it at a later period from contact with the Germans. The Reformation introduces another era in the history of the Danish language; and the translation of the Bible into it gave it a fixed character, and raised it to the rank of a written tongue. As in Germany, so also in Denmark, a rage for everything French prevailed for a time, and many Gallie terms were then introduced. A reaction, however, took place in the latter half of the 18th century; and, since the beginning of the 19th, much has been done to restore and maintain the purity of the Danish tongue, by the establishing of a taste for Old Norse studies, and by the writings of such men as Baggesen, Ochlenschläger, Grundtvig, and others. Since the union of Norway with Denmark, towards the end of the 14th century, the Danish has been the literary language of Norway; and it is also the language of the educated classes, as well as that gene-rally spoken in the towns. The modern Danish is one of the softest languages now spoken in Europe. foreigner hears it spoken for the first time, he hardly perceives any sounds in it except the vocalic, the consonants being so much softened in pronunciation that they soarcely appear. The vocalic system is hence very perfect; and Dr. Rask has distinguished ten vowels, the sounds of which are all quite distinct. The inflections are few and simple, and the language is one that may be easily mastered. Although Denmark can scarcely be said to have possessed any national literature, properly so called, prior to the 18th century, yet its origin may be carried back to the time of the Reformation. The oldest remains of the Danish language do not ascend higher than the 12th century, and consist of laws of the early kings; as the "Skaanske Lov," the "Sjellandake Lov," &c. To the 12th century belong the works of the historians Saxo Grammaticus and the works of the historians Saxo Grammaticus and svend Asgesen, which, however, are in Latin. In the 13th century we meet with what seems to be the oldest of the Danish heroic songs, or Kjämpeviser, and which are still more numerous in the 14th (collected by Nyerup, Abrahamson, and Rabhek, 5 vols., Copenhagon, 1810-14; Supplement by Rasmussen and Nyerup, 2 vols., 1821). Like the German, the Danish owes fig character as a written language to the Referention. its character as a written language to the Reformation. The greatest writer of this period in Denmark, and in a certain sense the founder of modern Danish literaa certain sense the foundation (1480—1554), who, besides a rumber of other works, had a principal hand in the translation of the Bible. The literature which in the translation of the Bible. thus received a stimulus from the Reformation at first specially took a direction towards history, as well as to investigations connected with northern antiquities. There appeared in the 16th and 17th centuries not only a number of works of the first importance on the thistory of the country, both in Danish and Latin, but there were becau, even in the 16th century, investiga-tions into the northern antiquities which have been so successfully followed up in recent times by Haldersen. Olavsen, Magnussen, Rask, Rafor, Müller, Thomsen, Petersen, and others. The period of modern Danish poetry may be said to have commenced immediately after the Reformation. At first the subjects were generally of a sacred nature, as we see in the works of Rasch, E. Pontoppidan and others. Arreboe, who was the first of their epic posts, describes, in his great

## Darien Scheme

work, the "Hexameron," the events of the days of creation. Danial poetry resulted collmination during the time of the lyric post. Kings (1834—1723) and his contamporary Sorterup. A new epoch commenced with the and versatile Ludwig von Holberg, the create Danials tage. He, in the first half of the little and Ewald in the second, are considered to us golden age of Danials histerature. The first targety was Ewald's "Rolf Krage;" and best and Ewald in the second, are consurred to make any golden age of Danish literature. The first truly subtomal tragedy was Kwald's "Rolf Krage;" and beside him, as dramatista, stand Samsöe, Sander, and Thustup. Among the other poets belonging to this period, are Jone Buggesen, Tullin, Falster, Friman, Braun, Zetika, the brothers Trojel, Pram, and others. A new invitate was given to poetic literature by Ochlemenläger (1773–1851), who had as contemporaries in the same field, Stoffeldt, Ingemann, Grundtvig, Heiberg, Overskot, and others. Among the most recent poets as Heffs, Blicher, Hölst, Rosenhof, Winther, Von Hauch, F. L. Möller, and Molbech. As a poet and writer of there tales, Hans C. Andersen has acquired a European reputation. In the region of history are the names of P. E. Müller, N. M. Petersen, H. Engelstoft, J. Möller, Molbech, Werlauff, Knudsen, Bestrup, and Worsase; while important historical works have also been produced by G. L. Bader, F. L. Jahn, L. C. Köller, R. Allen, Nathanson, and Wegner. As publicista, are distinguished Direkinck-Holmfeldt and Catwald; as statisticians, A. Baggesen, Bergsoe, Nathanson, Baffander, P. L. Schaller, A. Baffander, distinguished Dirckinck-Holmfeldt and Ostwald; as statisticians, A. Baggesen, Bergsee, Nathansen, Buf, and Anschen. The services rendered by Schouw to physical geography, and by Oersted to physics and chemistry, are known and acknowledged for beyond the limits of their native country. Among theologians are Martensen, Myneter, Clausen, Nielsen, and Schamers and Martensen, Myneter, Clausen, Nielsen, and Schamers and among jurists, A. S. Oersted and Algreen-Ussing cocupys first place. As a philologist and critic, Madvig has made himself a European reputation; while Westergaard, from his knowledge of the languages of India and Persia, and Bröndsted and Petersen. from their knowledge of classical sationity. have guages of linus and rerais, and classical antiquity, have sen, from their knowledge of classical antiquity, have rendered good service to learning. The works of Thor-waldsen, presented by the artist to his countrymen, have created a taste for sculpture and the fine arts generally among them, and given a new direction to their mental culture.

DAPENE, dif'-ne (the Greek name of the laurel), in Bot., a gen. of plants belonging to the nat. ord. Thy-melaceæ. The species are mostly shrubby evergreens of great beauty, with leaves of a peculiar velvet tex-ture, and very fragrant flowers. The root-back of D. Mezereum, the mezereon, or spurge clive, is offi-cinal in the British pharmacopenas. It may be used as a vesicatory, and as a masticatory in toothache; but it is principally employed as a stimulant, diaphoratic, alterative, and diuretic. It owes its properties to an acrid resin and an acrid volatile oil. The stem bark The stem bark has similar virtues, but is generally considered to be less active. The fruit is acrid and poisonous; The bark of D. Laureola, the spurge laurel, is sometimes substituted for the officinal bark. The inner barks of D. cannabina and other species are used in some parts

of the world for making paper.

of the world for making paper.

DARIEN SCHEME, dair'e-e-n, an ill-fated under-taking, projected in 1695 by William Paterson, a clergyman in Scotland. This person having a strong desire to see foreign lands, made his profession the means of gratifying it. He went to the new Western world ostensibly to convert the Indians; but while there, he observed that on the Isthmus of Darien there was a treat of country which did not halong it there was a tract of country which did not belong to the Spaniards, and was inhabited by a race always at war with them. He also noted that the natural features of the country were admirably adapted to the construction of harbours and the formation of a colony. Paterson's original idea was to have submitted his project to England; but having few friends there, he was dis-couraged. He then applied to the Dutch, but they couraged. He then appear to the thirds, having made heard him with indifference; after which, having made the acquaintance of the marquis of Tweeddale, he re-solved that the scheme should be carried out in Septland. The Darien Company was consequently esta-blished by act of the Scottish parliament, and seme-tioned by royal authority. Its principal aim was go form a great commercial station between the Restern and Western hemispheres. When the subscription line

was opened, all classes superly subscribed, and in a very short time £400,000 were signed for in Scotland, although there was not ceall to the value of £800,000 in the singdom at that time. Afterwards England subscribed £300,000, and the Dutch and Hamburger £200,000. At this period, however, the jealousy of trade caused the English perliament to protest against the formation of the Basis India Company. The king interfered, and the result was the almost total withdrawal of the English and Dutch subscriptions. The Scotch, however, were not depressed by this opposition, but rather elasted; and on the £6th of July, 1896, twalve hundred men set sail for Darien from Leith five thiss. Nearly all the inhabitants of Edinburgh cause down to see them depart. On reaching their described in the entire. to the stage. Nearly all the inhabitants of Edinburgh come down to see them depart. On reaching their destination they purchased lands from the natives, and sent messages of amity to the neighbouring Spanish governors. The colony was called New Caledonis; the lite of the principal city, New Edinburgh, was fixed upon, and a fort commenced at Acta, called Fort St. Andrew. Everything succeeded for the first few months; but when the hot summer weather arrived, many of the colonists sickened and died. Their promany of the colonists sickened and died. Their proons began to fail them also; and on applying to the British colonies in America, they heard with indignation and dismay that the authorities, having learned that King William had not given his sanction to the scheme, After lingering eight months, waiting in vain for assistance from Scotland, they almost all died or quitted the settlement. About thirty of the colonists governer of Scotland. Paterson was one of these, and during part of the time in the passage home he was insane. or the time in the passage nome he was his inc. While these misortunes surrounded Paterson and his companions, the Scotch, ignorant of what had occurred, sent out another colony of 1,300 men to support the extinct settlement. A Spanish force of 1,500 men immediately attacked the new-comers, and after a gallant resistance they were finally obliged to quit the territory. Paterson never wholly gave up hopes that the scheme would be tried again; he survived many years, neglected, but pitted and respected. The Scottish India House in Edinburgh is the chief memorial of the Darien scheme, a project which very materially injured the commerce of Scotland, and excited a deeply hostile feeling against the English government and nation.

DAPER, dar'-ter (Plotus Ankinga, Liun.).—In general form this bird resembles the cormorant, but the head is smaller, and supported on a very long and slender needs. The beak is perfectly straight and pointed, with the edges of the mandibles denticulated. Buffon, in allusion to the darter, says, "It offers us a reptile grafted on the body of a bird." It is sometimes called the snake-bird. Its habits while in the water have contributed not a little to its name. It generally swims with its body immerged, especially when apprehensive of danger, its long neck extending above the surface, and vibrating in a peculiar manner. "Whether the darter be swimming or flying, it is certain that the most striking and remarkable part of its body is its long slender neck, which is continually in tremulous oscillation. In flight alone it is unmoved and stretched out, and forms, with the tail, a straight horizontal line.
Its long tail, composed of strong and elastic feathers, screen as a rudder when awimming submerged in pur-mit of flahes, upon which it principally feeds. When ant of false, upon when it principally leeds. when the darker esizes a small fish, it swallows it entire, but if it be too large, it carries it to a rock or the trunk of a tree, and, fixing it beneath one of its feet, cuts it in two by a stroke of its bill. It establishes its nest on treasor rocks in the vicinity of waters."—(Temminck.) The darker is found in the warmer parts of the world, in America, and Africa. Although of aquatic habits, it is said to build in trees

Distribute, dd-so-u-res (Gr. dasus, hairy; ouros, tail). This family includes the largest of the rapacious margingles. The largest of the species (Dasyurus ur-sines) measures about eighteen inches long in the body, and as covered with long thick hair; of a black colour, It is a matter of Van Diemen's Land, where it is com-monly known as "the devil." It is chiefly destructive monly known as "the devil." It is chiefly destructive which are widely distributed over the world. The only among sheep, and, despite its smell size, is capable of doing immesses satisfair among the penued flocks, which is employed in Cashmers for dyeing yellow.

When Van Diemen's Land was first colonized, "devils" were very abundant; but they are now for the most part bamahed to the woods in the unfrequented parts of the country, where they missist on small quadrupeds and birds. The feet of the dayyarus are formed for terrestrial progression; the anterior have five toes, and the hind ones four, all perfectly separate, and armed with curved claws. The deficient toe of the hind feet is cometimes represented by a cort of tubercle, which, however, does not reach the ground. The teeth are usually forty-six in number; the form of the molars in the upper jaw is usually irregularly triangular, with three points. The dayures are evidently snalogous to the ordinary carnivorous guadrupeds, not only in their ferocity and carnivorous proposities, but also more or less in form.

DATA, dai'-td (Lat., things given), in Geom., are certain things or quantities which are given or determined by the conditions of a particular problem. A thing is said in general to be given which is either actually exhibited or can be found out; that is, which is either known by hypothesis or can be demonstrated to be known. be known. Hence, in the analysis or investigation of a problem from the things that are laid down to be known or given, by the help of known propositions, other things are demonstrated to be given; and from these, other things are again shown to be given; and so on, until that which was proposed to be found out in the problem is demonstrated to be given. In the book of Data ascribed to Euclid, which is the most valuable of the works left us on geometrical analysis by the Greeks. the word is used for such spaces, lines, and angles as are given in magnitude.—In Philosophy, Medicine, &c., the facts from which an inference is drawn are called data.

DATE, dail (Lat. datum, given), the time when an event happened, or when anything is to be done. The date of an event, or of a document, is often of great importance; but it is frequently a matter of great difficulty to ascertain it correctly. One of the chief obstacles is the difference between the two styles by which dates are reckoned, and through which a discrepancy of between ten and twelve days may be made in the calculation, according to the century to which the date belongs. There was only one style of reckening the date belongs. There was only one seyrou avanua-time in Europe until 1882, when Pope Gregory XIII. introduced the "new style," which declared the 5th of October, 1582, to be the 15th, thereby correcting a number of errors which had accumulated. The ten number of errors which had accumulated. The ten days were then struck out, and nearly all Roman Catholic countries adopted the new style; the Protestant countries, however, retained the old or Julian calendar, for a longer or shorter period of time. (See CALENDAR.) Thus, in all dates after 1582, it is necessary to accertain whether the old or new style was used at the time and place specified. Many old documents are dated from some particular service of the church on the day of writing; and in some nations, for a great length of time, it was customery to date from the year of the monarch's reign.

DATE OF A DEED, is the description of the time, viz. the day, month, year of our Lord, year of the reign in which the date was made.—1 Inst. 6. (See DEED.)

Which the date was made. I me. to (NE)
DATE-PALM and DATES. (See PHENIX.)
DATHOLITE, dath'-o-life, in Min., a boro-silicate of lime, found in various parts of the world in oblique. rhombic prisms. It also occurs in botryoidal forms, when it receives the name of botryoids. It is found rather abundantly near Lake Superior, where it is profitably employed in the manufacture of boracic soid.

It is also used as a flux for copper ores.

DATISCACEE, dui-tis-kui-se-s (deriv. unknown), in Rot, the Datisca fam., a nat. ord. of dicetyledonous plants in the sub-class Monochlamydem, consisting of herbs and trees having the following botamical characteristics. neros and trees having the following botanical charac-ters:—leaves alternate, excipulate; flowers diclinous; male flower with a 2—4-cleft calyx; 3—7-framens; anthere 2-celled, linear, bursting longitudinally; female flower with a superior 3—4-toothed calyx and a 1-celled ovary, with 3—4 polyapermous parietal piacentas. Fruit dry, opening at the apex. Seeds without abumen, minute, numerous. The whole order includes but four apsecies, which are widely distributed over the world. This only

# Dative

DATIVE, don'tive (Lat. donings, frameso, I give), in the grammer of most inequages as the name of the third ones in the desication of norms, and serves to denote participation by the noun in the action of the verb which

accompanies it.

Dagues, dissiral (from tatorus, its Arab. name), in
Bot, a gen. of plants belonging to the nat. ord Airopaces The species D. Stramonus is the thorn-apple, gaces The species D. Stramonium is the thorisppie, in plant possessing extraordinary narrotic properties. It is much employed in medicine as an anodyne and antisparmodue, its effects resembling those of bellamount of a spasmoduc estima, smoking the herb, or inhalation from its infusion in hot water, frequently gives greatrehef, but in some instances, when thus used the herb has produced fatal results. A strong decoc A strong decoction of the leaves in water is used in Cochin China as a remedy in hydrophobia, in which terrible disease it is reputed to be very efficacions Stramonium owes its principal activity to the presence of a narcotic alkaloid called deturis, which much resembles hyose jama and adropus, the alkaloids of Hyoseyamus meer and Atropia Belladonna The deturio is cape cally abundant in the seeds, it is a powerful poison, and strongly dilates the pupil. D Tatula, motel, feron fistuosa, and sanquinea, have similar properties to D Strumonium. The trust of D. sangumea, the red thorn apple, is used by the In-dians of the Andes and of (-ntial America for preparing a narcotic drink which produces a peculiar kind of intexication, and is supposed to put those who partake of it in communication with the spuits of their an-opators — Enf Johnston & Cl. nestry of Common Life da-tu re-a in Chem , the active principle

contained in the seeds of the Diffusa 5 semonium which appears to be identical appears to be identical with that of the belladonna DALCES,

Pot a gen of plants of luming to the nat ord metal metal D (neta, mated) var vat co, is the cultivated or marlen entrot so much esteemed for its enculent ic to Those roots are occusionally used in in di ome as a joultice, for their mediately stimulant proper us the termindersed from the tire k a no I nale h t mall sich to its medi curil effects

DAUPHER, do fan(a) (Lat delpin s), the title horne by the hen-specient to the rown illian e before the Revolution. It was originally held by the cours or lords of Vienne, in the province of Daulina. Humbert II, the last of these lords did without reme in 1319, and here it takes out a fact without issue in 1319, and bequeathed is possessions to Charles, the grandson of Philip of Valus, on condition that the hear-spizarent to the throne of Frince should be arthered by Louis IA upon the dauphin were almost regal, but after his reign they were gradually it say ned, and the title become a neer honorary distinction.

DAYING DAY, St. day and as hald on the let of

DAVIDS DAY, SI, dat under, is sheld on the 1st of Maish, and was originally deducated to 5t David, archivashop of Menevia, now called St David, in Pembrokeshire St David is the patron saint of Wales, and is said, during the days of King Arthur, to have work a victory over the Sevene David to to have won a ratory over the saxons During the fight, the wrobbishop's soldiers wore lecks in their caps, as distinctive marks. In memory of this conflict, the Welsh still wear the leck on St. David s day

Dust

here are many medi-lections of the Davy-ber are all lamp, but they are er in their fundamental principles.

DAVIT, ddv-it, in
Mar, a piece of tun-

ber projecting over a ship s bow, used as a crane to houst the anthor out of the water m such a manner as to prevent its rubbing against her side and injuring the planks. This name is also given to pieces of placed in pairs in cerium parts of a vessel's



sides and stern, employed for holsting and lowerite

boats (See Boat Lowneine Apparatus,)
DAWE, or DAK, duck, a mode of travelling admin India The traveller is borne in a palaments in the first traveler is borne in a passaguar attituto to station in his route, and his ingress on the arc carried in boxes or baskets, called patterns separate hearers who accompany the palanguar, usual number of hearers who accompany his this travel is about cleven, and a fresh relay of them is supp by the postmasters at each station. The static from nine to cleven miles apart. The arrange The station with regard to the cost are made with the postume of such presidency before starting, but the trees is also expected to give the bearcis a gratuity at and of each stage A sum equivalent to st. Hor shilling is g rerally sufficient to divide among to At aveling carriage, with seats for four, is used in the great trunk it id from Calcut; to the Upper Pr vinces it is called a horse-dawk, but it is not get

rally in use in other parts of the country

Dawn, duen (bax daquen), the break of day, the
twilight, or half light that occurs between the first

appearance of light and the rang of the sun.

DAY du () at deg, probably from Int. deep,
that period of the earth's revolution on the suns in
al all its surface is presented to the sun. The term is, however, applied to any astronomical space of time which depends directly on the earth's rotation. But which depends directly on the care a rorange. Due the only days desinguished by that name in astronomy are the sidereal day, the real solar day, and the mean soin day. The sidereal day is the period heaven the two transals of the same fixed star, that is, a complete revolution of the cith. It is divided into twenty-four revilution of the cith. It is divided into twenty-four hours and begins when the equinox is on the meridian of the place. The real solar day is the interval between two transits of the sun over the meridian. The length of the real solar day values at different periods of the year, on account of the unequal motion of the sun and the obliquity of the ecliptic. The mean solar day is the average of all the real solar days. The mean solar time is thus arrived at by imagining a sun moving uniformly in the celestial equator and completing its circuit in the same time as the real sun. The real and mean solar days only coincide in four the real and mean solar days only coincide in four days of the year. In the intervals the sun is either too fast or too slow The difference is called the Equation of Inne (which see). The mean solar day is 34 hours minutes 56 55 seconds of sidereal time; and the i minutes 56 5 seconds of midereal time; and the sudcreal day is 28 hours 56 minutes 40g seconds of a mean solar day. The ancients generally began their day at sunrise, with the exception of the Egyptians, who began at midnight, and the Arabhans, who began at moon. The latter nation still retains the same custom, and most of the modern Eastern national reckon the commencement of the day from sunrise. A day is Loss uncludes the whole twenty-four hours, without reference to light or darkness. Unless there illet, the Weish still wear the leek on it David's day DAWY-LAWS, day't to kimp, in Miu, a lamp invented by Sir Humphry Davy to obviate the leavid explosions liable to take place in coal-mines from taking ranked lights into places containing firedamp, a light rection the commencement of the day from sunrise, that when a lamp is surrounded by wire gauze, the meshes of which are under the fortich of an inch, and provides the whole twenty-four hidner, that when a lamp is surrounded by wire gauze, the meshes of which are under the fortich of an inch, and provides the whole twenty-four hidner, that when a lamp is surrounded by wire gauze, the meshes of which are under the fortich of an inch, and most of the modein Eastern nations, that when a lamp is surrounded by wire gauze, the meshes of which are under the fortich of an inch, and the commencement of the day from sunrise.

Adv at sunrise, with the exception of the Egyptians, who began at midnight, and the Arabanas, who began the countries.

ing are gold if made. Good Friday, and a the same footing as set. Days of grace.—meral three days are ise, in general three days are t beyond the time marked on dditional days are allowed by him, and protected by the laws of the m; they are called days of grace. When if grace falls on a Sunday or fast-day, idered due the day before.

(See EPHEMERA )

www.Gr. ductoros, a servant or minister), a New Testament for any one that ministers so of God, and it is also sometimes used by ecclenistical writers, when it includes of presbyters as well as deacons, but it is now by simpleyed to designate the third or lowest of the angles in the Christian priesthood. The prirue tares orders in the Unishan priesthood. The primitive deacons took care of the secular affairs of the Church, received and disbursed moneys, kept the abuuml's seconts, and provided everything necessary for its temporal good. We have an account of their first implification in the sixth chapter of the Arts of the Apostor; and in the third chapter of the First Epistle
to Timothy we have the qualifications specified that
were appearant to the office of a deacon. There were were necessary to the office of a deacon. There were also descenesses in the primitive church, one of whom was Phoshe (Rom. xvi. 1), and this order, though generally dispased in the Western church in the 5th century, continued in the Eastern until the 12th In the primitive church, the deacons were styled "ministers of the mysteries of Christ." It formed part of their duties to take care of the holy table, and the ornamenta and utensis appertanting thereto, and to receive the oblations of the people and present them to the priest. In some churches they read the gospel in the communion-service, and ministered the bread and wine to the people in the Eucharist they also baptized, and, with the bishop's license, sometimes preached. They with the bishop's license, sometimes preached. They were also went to direct the people in public worship, many existant known forms of words it give notice when each part of the service began, and they cometimes represented the bishop in general council. The Charch of England enjoins that "none shall be admitted a deacon, except he be twenty-three years of each indicate whe land down as follows—"It appertained to the office of a deacon, in the church where he shall be appointed to serve, to assist the priest in divine service, and specially when he ministered the holy commission, and to help him in the distribution thereof, and to read Enjy Scripture and homilies in the church and to read Holy Scripture and hondies in the church and to instruct the youth in the catechism, in the observe, of the priest to baptize infants, and to preach, if he is admitted thereto by the bishop. And, further more, it is his office, where provision is so make, to search for the sick, poor, and impotent people of the patish, to instinute their estates, names, and places where they dwell, unto the curates, that, by his experience, they may be relieved with the alms of the patishioners or others." In the present day, the more combined duties of the officer hand day, the more combined duties of the officer hand day, the more and to read Holy Scripture and honulies in the church soulise duties of this officer have devolved the fly upon churchwardens and overseers of the poor, and his spraining functions have been more extended. He may ociebrate matrimony and the burial of the dead, in fact, perform all the ordinary offices of the istian priesthood, except consecrating the elements

or iron bands, which, with the bein of other tackle, from a purchase for orbinding the abrouds and stays, otherwise called the standing rigging.

Dian Lawauaus is a beam amployed to denote such languages as are now no longer spoken by any people or nation, in contradistingtion to assis as are so spoken, and are known as bring languages.

Dran Reckoring, the mane given in Mar. to the method of determining the position of a ship at sen by a calculation based on the following data; the latitude and longuide from which the vessel saited, which is a calculation based on the following data; the latitude and longitude from which the vessel sailed, which is generally called its point of departure; the time which has elapsed since it left this point, or any other of which the latitude and longitude have been properly determined, the direction in which the wessel is sailing, as an an an analysis of the compass; and, lastly, the rate of sailing, as crumed from measurement by the log. (See Loc.) In this method of calculation, no regiouse is had to observations of the sun, moon, sid signs; but, owing to changes of the wind, the influence of currents, and a variety of causes which affect the currents, and a variety of causes which affect the course of the vessel, the results of the computation cannot be depended on, and they must be corrected by calculations made from observations of the heavenly bodies

DEADLY NIGHTSHADE, or DWALE. (See ATROPA.)

DEAF AND DUME, def dum (Sax. deaf dume).—A

person is said to be deaf when he is other entirely or person is said to be deal when he is under entirely or a great measure destitute of the sense of instring, and dumb when he is without the power of speech or of articulating sounds. Such individuals are also sometimes called deal-mutes. Deafness is either congenital or acquired. When congenital, it arises from an experimental of the article statement of the article sta or acquired. When congenital, it arises from an original maiformation of the ear, and is always accompanied with dumbness, when acquired, it is the result of some disease affecting some of the delicate parts connected with the origan of hearing (See Draffers, Dia, Hearing). The ear is necessary to articulation, which is acquired by initiating the sounds we hear uttered by others, and therefore it a management. uttered by others, and, therefore, if a person is unable to distinguish between articulate sounds, had unable to distinguish between arriculate sounds, he is incapable of acquiring speech, at least in the ordinary way, and is dumb in consequence of his desiress. It is tare indeed to find dumbnes in deaf persons resulting from any imperfection in the organs of speech, or from feebleness of mind; and hence the fallacy that till recently prevailed, that the want of the power of speech was owing to a mental or physical incapacity of the individual, who was thus incapable of receiving education. Persons who have lost puble of receiving education. Persons who have lost their hearing after having acquired the use of speech, and who are thus still able to communicate their ideas. orally to others, do not come under the class of deal and dumb This affliction is much more common than, for a long time, and up to a very recent pariod, it was believed to be The census of 1951 was the first that believed to be. The census of 1951 was the first that revealed to us the number and proportion of designal dumb in this country. According to that return, we find the number of deaf mutes in the United Kingdom to have been at that time 17,300, or one to every 1,550 of the entire population. The relative proportions, however, differ much in different parts; being, in Herefordshire, as high as one in 1,05; in Wordestershire, one in 1,100, and in the northern countries of Scotland, one in 1,156. In the ex-metropolitan portion of Kentingsun there is only one in every 2,349; in Durhard, one in 2,150, and in Huntingdonahire, one in 5,016. What the causes are which produce dealness are say without very imprefectly known or understood. There can be very imperfectly known or understood. There can be The issue preschood, except consecrating the chemits in the Eucharist and pronouncing the sholution. He supported in the Eucharist and pronouncing the sholution. He supported in the Eucharist and pronouncing the sholution. He supported in the Eucharist and pronouncing the sholution. He supported in the Eucharist and pronouncing the sholution. It is requisite that he shows principle the principle of the sholution challed in the short of deer that the more prevalent than in plans and flat durieds, and in run il parts than in cities or towns. A married flavor or an impure atmosphere, undoubtedly tandes or ender that the frequently stands to reader the process and the following the power classes as addition to chieflest, dearches who are ordained to the first of the no doubt, however, that there exists some sompection

is seldom transm ents to children. of the New York Institution out common for the hildren of to possess the faculties of which leprived " This fact is clearly es-(a were sequenced as a constant of the constan centuries alapse before we read again of any to pastruct this unfortunate class of persons, including a pative of Groningen, a deal mute that he had known having been o note down his thoughts Halfa century later, reads and versatile professor of Pavia university, a Cardan, gave to the world the theoretical principles which the instruction of the deaf and dumb field. It says, "Writing is associated with and speech with thought but written cha ad ideas may be connected together without when diess may be connected together without farrention of sounds, as in hierorghyphic charac-and asserts that on this principle the instruction deaf and dumb is possible though difficult — his time. Father Fonce (1520 54), a Benedictine acquired a great reputation for the ching the deaf a to apeak and write In 1620 Juan Paulo Bonet, a like Ponce, and a monk of the same order. a book on the instruction of deaf mutes, and in a conshanded alphabet 1 rom that time the teams to receive more attention, a number of were published, and various systems proposed the persons who more particularly distinguished the persons who more particularly distinguished the by their labours in this fit Id, were Dr. John Co., Dr., John Wallis, Dr. William Holder, George to, in England, John Con ird Amman in Holder, and England for the education the interest and the second secon mutes were those of the Abbe de l Lpic in and Mr. Braidwood in Fdinburgh, both in 1760 am of De l'Epée was much unproved by Sioni d nil and specessor in the Paris institution, and il and successor in the Paris institution, and autitied to rank with him as one of the greatest store of the deaf and dumb. In 1783 Mr. Braudemoved to Hackney, near London, where he for many years with great success. He late Macra, so long superintendent of the London, it was instructed by him, and stood in the same and him that bleard did to his master De I Epéc. Ros to him that Sicard did to his master De I Lipec 28 the London Asylum was founded, and it has the means of doing much good among this unforte fleats, having at present upwards of 300 pipils that segimung of the present century, a number filler institutions have been founded, the principal sich are those of Manchester, Doucaster, Jubin, pool, Sirmingham, Belfast, Edunburgh, Glasgow, hites, and Newcastle. It is very difficult for one was set awas some attention to the subject to given some attention to the subject to ag sice a true conception of the helpless one that is born deal and dumb. He as that a fall ideas connected with sound, parent of the means by which instruction are usually conveyed to the mind och is to him a nonentity, and he is of the power of words. He can hold in the power of words. He can hold ion with his fallowmen, except by the state are arranglings. His ideas are he with the state are the state are the state are the with the state are the with the state are the with the state are the state a aperior natural ugus. His ideas are set to the objects and events he witteness relations of things, and he is this knowledge derived from history

shippy in best etter grant monreds general trom platers. Venerous or friends and no to

ration in instructing the have a meaning, and suggest to the same idea. It is necessary him in the names of external those which are best known to presented to his view I has, the such as a knife, may be written board, and the attention of the nately to the name and to the ob to him at the same time, until he to under tand that a certain rel them After he has been taug the names of objects and the p letters of the alphabet and the p together with the meaning of roller tinguished from those denoting me parts of objects General terms, at mon to a number of individuals, comprehending a number of species explained, and lastly the most ge terms, such as being, object, &c pressive of the accidents, variations of otjects, and which are expressed next taught The master must and pert taught "An master must waster pupil concern these qualities, in this inherent in the of jects themselves, and of being detached by a mental operation objects, though in fact they have no a united with them. The means employed. tion of the deal and dumb are,-1 of pictures, signs, and gestures; 2 or dactylology, and writing, and reading on the lips The first is the simple mode of communicating instal ology, or the manual alphabet, is a me the different letters of the alphabet fingers There are two kinds in use; one hand being employed, in the other be is the more common. Writing is and means in the education of deaf mutes not only as enabling them to ax their mind, but as being also the chief m they can hold intercourse with strange 14 only in this country regularly and taught in the London Asylum and in Depital Ldinburgh It is the teaching express his ideas in speech. In side sense of touch, as well as the eye, as a pupil is made to notice the movements. organs of speech of the teacher, to hand the vibrations which sound cres and also to feel those emissions of be and also to feel mose emissions of section a caused by the production of pertain a made to imitate such utterances, and patience and ingenuty on the part of will at length succeed in imitating with and in expressing himself by speech. and in expressing himself by speech. lips, as it is called, is intended to bisable to understand what is said to kinn observing the motion of their hyps. that attend this mode of matricition and so far as it is intended to statical that it is aid to him, are manyerable however, is pursued in Germany, and he with very considerable affeces. We have enough on this subject for the general those who desire more particular indemstrates to the works of Dr. Watson and a devoted to this subject. Long and all devoted to this subject. Long and all devoted to this subject. to understand what is said to him

troying some portion of the It frequently results in the external passage of the with the transmission of sound to has a often occasioned by an unusual ceramen, or wax of the car, which the glands of the passage. The most tital way of removing this is by syring ith warm water three or four times a day in brought away. Inserts and other foreign meetines lodge in the ear, and occasion deat indeers or morbid growths may firm in the pand disus interrupt the transmission of sound sum may be inflamed, thickened, or injured ha degree as to be wholly incapable of performhim habe, which conveys air from the back the mouth into the intrinal cavity of the ear, in encasion a considerable degree of dealuess a inflammation and other diseases of the throat quently this effect Deafness also a metimes on derangements in the minute and compl . ts of the organs which are beyond the reach observation, and consequently are but imper periodicated from the internal ear to the brain as stillers to disease, and may occasion denines may also result from diseases of the ir un itself exposure to loud desfening noises, a cold various said inflammations, theumation, headache and d cutaneous eruptions, frequently produce deaf
The particular plan of treatment to he parsued
the particular plan of the cause, and will sarily vary considerably in different cases while to assertain the real nature of the case. The b ether organs, and are to be treated upon the inciples. When they result ir m influming tion, principles. When they removed in the usual way, them polypi or morbid growths these are to be appropriately and appropriation, when wed by lunar caustic or a surgical operation, who user your debility, the general tone of the attempthened. When an obstruction of the by strengthened when an obstruction of the high rabe as the cause of deafners, it is often it by perforating the tympanum. When it is all to partial or entire loss of the tympanum an important of the complex of the tympanum and the by hir Joseph Toynbee, of calcanged in its attached to the end of a fine silver were by of which it may be inserted or withdraw Ret. The Diseases of the Fur, by Joseph London, 1560

made of fir wood more than six f et in length, They are generally sthan seven inches wide. They are generally the thick, and when sawn thinner are usually Most of the doals imported into this ome from Sweden, Norway, the Bultir, and The duty on imported deals and hatfines countries is ten shillings per lead of feat. On those imported from the British daty is five shillings and threepence per

a sen, of fishes belonging to the Ribbon and sailed because of their resemblance to The Vasgmaer, one speces of this of the coasts of Leeland and Norway is the course —A very important piece diving the givernor simply and diving the givernor simply and diving the givernor simply because it admits of ready a series along the givernor simply along the master power included in it, in the ready in the ready to vary the simple along the superior of the dimensional state of the simple simple

r n. fant.and.loo shaft, upon which a b may be passed. Fig 1, Plate XX elevation of the machine, fig. 2 taken at the left of fig. 1; fig. ection taken vertically throng bgures the same letters of refer the same parts A, A, the standards, c framings of the machine, are bolted to and otherwise firmly secured to their the the flooring (B B) thus dividing the tween the upper and lower spartme containing driving power, the other by the saw frame muchinery strictly so sails culinder of the steam ongine by the agency the sawing machinery is driven, as shown a supplied with steam in the usual manner, slide valves contained in the valve casing (s receives the steam from the botler through steam pipe (D) and the induction-pipe (E served its purpose in the cylinder, the st charged by the duction pipe (F) into the was pipe (G) II II the man driving shaft, upon bearings tree I upon the top of the (A, A) 1h shaft carries two fly-wheels (I ercentries (I. h), an I also the two crank-pla In these last me fixed the crank-pins are connected by the rode c to the shall of the frame of waws (c' d) I has frame travel parallel whiles or guide-pieces (c, c), attached checks if the framing (AA). It will be seen while the eccentric if is working the alidswhich admit and dischurge the stram to an the cylinder C, the eccentre K is imparting to the spin-wheels (f f) for the purpose of the M or leading forward the timber by means of the M rod (f) and ratchet, or shek (h), which driver the twheel (i) and punon (f), these being up it the same carrying-stud. These sputs (f, f), which are it rather a fine pitch, give a progressive mot in to the timber under ope me ma of the e, stem of meter wheels and th and it will be perceived that of those wheels lower pairs are so mounted as to communicate m at ou to the shaft carrying the intended mon he toll to (A A), which, I this arrangement of the cerre un equal progressive motion, irg all teed to the timb rehown at 1.1 By the t mi cr, in its progress through the machin ally als ince land presented to the teeth of " as they are driven up and down by the recipration of the piston rod (1). It will also be unid that the extent or progressive motion gi feeding rollers through the agency of the gearing just described, may be varied or a the click or ratchet (h) being caused, in a movements, to escape over a greater or le of teeth of the natcher-wheel 2, and thus quicker or slower advance of the timber, as the nature of its grain or the number of i are acting on it. The governor, by what is steam to the valve box is regulated, is top of the ms hine, and is of the ordin tion the working parts of the governor being to the circular plate or disc of metal (%) driven by the friction of the periplicay in collar (o), keved upon the mam shalk driving the givernor simply by friotion because it admits of ready adjusts collar never to, or farther from, plate a thereby regulating the space as may be desired by the attends necessary to vary the speed of the se attendent, different qualities of the timber to be Having thus described the general each

it fate out and thus admitting e will cause the piston (? where an expensive terre was cause too pison (i), and by the excess head (se) and side-inks (m', m'), there are the shaft (M) carrying the frame of (d, d), and thus, through the connecting rods, will drive the grank-plates (L, L) round, and by commutances rotary motion to the main shaft. high will impart its impotus to the fly wheels And at the same time, cause the occurros lotion to the slide valves through the rol p the down my the and oder on the piston works up we me the cylinder in the ordinary manner, it desaris to be percured that the necessary re upro-ble sation will be given to the frames containing statem of gaws (d. d). These saws are of course, stable in their respective frames, so that any er may be employed, and also set at any required sine spart It has been before stated, that the as being in operation, the oth r eccentric (h) will meanwhile cause the timber to advance to the teeth of the saws, as required, by the system of genring which works the four indented leading rollers ( $\kappa$   $\kappa$ It will also be priceded by reference Bg 1, that each of the vertical shafts (1) has a feether or raised hey upon its surface in order to carry the two wheels (), 1) round with them, and at the same time to allow these wheels to slide upon their respec-tive allows when in motion, in case of any inequalities save shares when in motion, in case of any inequalities upon the surface of the timber causing the upper firstling-rollers (k, k) to rise and fall. Loke  $\rho$  the which in gear, the tase of the pair of horizontal which is closured to embrace the end of the shall of the feel the relations. As shown in the latter that the feel the relations as shown in the latter that the feel th realisms, as shown in fig 1 Ordinary feeding-best with delivering rollers, are placed in front and dared the sewing frame, to conduct the deals and there to be out on to the places N, \ up in which same supported while under the operation of cut a said upon this plate, at the feeding on to or trust is machine, there is placed a central curic processed (6), against which the dale are to be pressed the springs f, f, having friction r lier at their de for that purpose. There aprings are adjusted to the three of the pinch required by the a null winch The tables pla ed belin i the machines, to receive the tumber after it has been cut mint our ! in other respects similar t th fr ittil the sean that there are two weights (W, W) susted from the shafts of the upper pair of feeding-(k, k) by the rods t t, in or los to keep them theon the edge of the tim er with sufficient pres remat the upward litt f the saws wien cutting woughts are also suspended in the contrely a chain and pulley from the shaft s, and at our takes shaft is a ratchet whiel (r) the biss of

if you this shall is a ratchet whiel (x) the best of the high mortions cut in it for the jurpose of it was a mortion of the propose of the state of the propose of the state of the state of the weight desired the for other when required from the form (Y dayen, lat decents) is an ecclestical desired the chapter of the chapter of tanons or pretained the state of the chapter of tanons or pretain the state of to tems from the Greek Ida, ten monasteries every ten meuks were sol net t date decumes, or dean, from his res ding over were hundred had another officer, who was in war pailed centenamus, from the Latin cer agreed. The luminous of the dean waste exact pared. The publices of the dean waste exact failable test, and to bring it to the even in na. If the house, who himself gave a monthly what suching suches, or head of the monastery to issue the property speaking, three classes of selections in employment to make the title dean be-tall manually raced death, deans of esthedrals, and

council of the bakon. by the chapter, but now t il bishops, issues a congé d'ébis the person that they are to by the price founded by Hemy VIII.
by I there patent only. The dean
idly that the bishop.—Dean's
chat officers of certain possible who by ancient usage, are entitled the dean of the Arches, the dean in 1807 the dean of the King's Chairing & In the universities of C 111 1905 ige, the dean is the officer appear

and are three clergymen of the e strate ar jourted by the crown, a I nated to preaching an occasional serving May sty when in bootland, and attending take representative peers. The amole i the representative peers. The emoling in are from 1.000 to 1500 annually to me not not recently the appointments had too d upor professors in the individual fairware mit slightly endowed. In the 1 mi King Collings, London, and in some of the unices (e.g., London, and in some of the classification of the control of the 1 classification of the 100 and 100 annually to 1 classification of the 100 annually to 1 classification of the 100 annually to 1 classification of the 100 annually to 1 annually to 1 annually the 1 annually to f the more represented a dvocates or Burrates burn is teld D nof Faculty. Herselected in a usually recteted until he is promete

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Draw or Guiro, in Scotland, is the main office who is at the head of the guildry of it t dy of amount al burgh. In former times office two his action need of the principle of the door immunity all lungh. In former times were very considerably, and he acted as just medical causes within the lungh. He was a member of the two council. His principle to with a time the lung within the lungs. tolan, ne ther encouching upon per n i in the julic streets or passages, and in dinger if filing be thrown down. In the same with the parties of the tage in the file of the tage. Di ern, de m common language. In I s as the necessary termination of all ices n t phenomena of which his spender tra sterre lirem the producing parts of ore puttap rah, is one of the most difficulty parts p rah, is one of the most difficult as gen riphysed Ly, and has never yet many in he rive lutter. In every part of a living there is a continual destruction of old partic i rue not rew ones going on; and, goin n reactive the vital activity of the many in its titus changes take place. Even in it it these changes take place. Even the lit; it is of the animal frame are not frame to had for the in in the soiler tasues. Every movement, do not not even every thought of the mind, is able with the death and diamtegration of a certain at i non- ular or nervous matter as its ne in hence, in the performance of each tions where in the performance of said at the of or tricular cigar which ministers to that multiples a certain loss by the decline and its component particles, and this the more in principles and this the more in principles.

ur instrumentality アトハレ ほおきゅう riormed with due vigour tion of the takes place, but with trative power and rears thus and the uptil at li taking pl

body, and which is, in fact, essential to its diseased well-being; and systemic or smooths, which is the death of the body as a whole. Bomakis death may result either from the general failure of the vital powers, as either from the general failure of the vital powers, as in old age, or from some flagues, or injury in some of the vital organs, which extends itself to the organism in general. It may be due to failure in the propulsive power of the beart, which constitutes symope; and this may occur either in consequence of the heart losing its irritability, and so couning to contract, or by being affected by tanit spasm, and so remaining rigidly contracted. In both cases death is instantaneous; the subject turns suddenly pale, and falls back, or drops down, exprising with one gasp. Or death may take place by the gradual cessation of the action of the heart; in which case it is termed asthenia. Somatic death may also be occasioned by an obstruction to the death may also be occasioned by an obstruction to the flow of blood through the capillaries of the lungs, or to the entrance of air to these organs, thus constituting applying, or appear. Death by come, or beginning at the brain, is caused by various influences, which primarily destroy the functions of the superior masses of the nervous system. The chief of these are obstruction to the circulation of the blood through the brain by pressure, and the effects of certain narcotic poisons, as opium, &c. As the ordinary act of breathing depends upon the nervous action of the medulla oblongata and inalis, it is quite evident why death may result from an impaired state of these organs; and this mode of leath is of the nature of approa. Death may also be death is of the nature of apprea. occasioned by a disordered condition of the blood itself, which at the same time weakens the power of the heart, impairs the activity of the nervous system, and prevents the performance of those changes in the capillaries which afford a powerful auxiliary to the circulation; this is termed death by necramia, and circulation; this is termed death by necromia, and occurs in typhoid fevers, and other diseases of a malignant or pestiential kind. Death may also result from the direct agency of cold stagnating all the vital operations of the system. It is to be borne in mind, that death is featured as that death is frequently produced by a conjunction, or by the rapidly-following results, of two or more of these modes; indeed, the perfect distinction of these different modes of death is almost exclusively confined to cases where the dissolution is speedy or sudden. The signs of approaching death are necessarily various The signs of approaching death are necessarily various, and depend, in a great measure, upon the nature of the disease. We shall notice some of those that are common to most diseases and to natural decay. In some cases there is a dulness of the senses, inactivity of the sauscles, vacancy of the intellect, and extinction of the sautiments, as in death resulting from old age. There is, also, frequently some degree of delirum, which is often of a most interesting and pleasing characteristic and described of a most interesting and pleasing characteristics. ractor, recembling dreaming more than any other form of derangement; sometimes, again, the dying fancies of the individual are of the most dreadfully distressing character; but it is presumptuous, as many do, to hazard much upon the various modes of terminating the arrest of life. In the delirium the reproduction of ensations often bears a considerable part ; and frequently the victim of typhus is seen catching at something in the air, or picking at it on the bedelothes. The sense of hearing is frequently also affected, and imaginary voices, and sounds of tolling bells, &c., are maginary vales, and sounds of tolling bells, &c., are heard: Dementia, or mental debility, sometimes comes or shortly before death, and for the most part manifests itself in an incapacity of concentrating the ideas upon say one object, and by an all but total failure of the memory; this mental weakness often painfully manifests itself in the apparent pleasure which the sufforer takes in some of the most childish amusements. The trying memorally becomes low and weak as death The rener generally becomes low and weak as death approaches; but sometimes it has a shriller pitch than natural cometimes it is husky and thick; and not unfrequently it dwindles to a mere whisper. The musstequency in wanter to a mere wisper. In income seems system generally becomes feeble and relaxed; the pulsations of the heart gradually feebler, but more frequent; the respiration sometimes hurried and passons, nometimes easing gradually; and sometimes slow, laborious, and stertureous. There is frequently, and stertureous there is frequently or the sterile of finite removed services. also, an economication of finide,—mucous, serous, or angel of death, called Samasi and frince of the Weste, purelent, in the bronchial tubes. What is known as the "death-entile" is produced by the passage of the king through the fluid collected in the representation of death (a skeleton with a serties)

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tracken and upper respiratory passages. The maribund are often impatient of any kind of clothing, throwing off the bed-clothes, and lying with thest bere, the arms off the best-clothes, and lying with thest base, the arms extended, and the sack as much expressed as possible. Among the other signs of approaching disselution, are the nuken eye, the hollow temple, the sharpened nose, the forebead dry, tense, and harsh, the complexion shallow, livid, or black, the lips cold, flacoid, and pale, or of a leaden hue. We believe that the opinion that generally prevails of the great amount of suffering that immediately precedes death, and which is expressed by such words as the death-struggle or agony of death, is very erroneous. There is every treason to believe that as death approaches, the scustbilities are gradually deadened, and that in most cases consciousness has ceased before the struggle commences. The number of suspenses of successions, when the show assuing, or surging muscular spasms, — the slow, gasping, or surging breathing,—the collapsed or distorted features, though in some cases accompanied by feeling, are altogether in some cases accompanied by feeling, are autogener, independent of it. Convulsion is not, as superficial theservers often imagine, a sign of pain; it is an affection of the motifie, not of the senside part of the nervous system. Those who have made the nearest approaches to actual death, as in drowning, have described their, feelings as being of an extremely pleasurable kind; and a late eminent physician told his attendant friends on his deathbed, that "he wished he could be at the trouble to tell them how pleasurable that a thing it was taddled." trouble to tell them how pleasant a thing it was to die. We believe that dving is not less truly than beautifully described in Scripture as being a "falling saleep;" idea which was also entertained by the ancient Gree who regarded death as the twin brother of sleep. The consequences of death first become apparent in the organs of sense and motion; the eve less its brightness, and the flesh its elasticity; the muscles become stiff, and coldness and paleness spread over the whole body. Yet it is often a very difficult matter to distinguish between real and apparent death. The most reliable test is afforded by the condition of the muscular substance; for after real death this gra-dually loses its irritability, so that it can be no longer excited to contraction by any kind of stimulation; and this loss of irritability is succeeded by the appearance of cadaveric rigidity. The most satisfactory proof.

this loss of irritability is succeeded by the appearance of cadaveric rigidity. The most satisfactory proof, however, is given by the occurrence of putrefaction, which usually first manifests itself in the blue-green coloration of the cutameous surface, especially of the abdomen, but which speedily extends to other parts,—Ref. Todd's Cyclopadia of Anatomy and Physiology. Carpenter's Human Thysiology, Miller's Physiology. Dearu, in Myth.—It is not to be wondered at that an eyent so impressive and so deeply interesting to all should have excited the attention of every people, and led them to form very different ideas regarding it. It is indeed remuskable that the Greeks, whose conceptions of an after-life were so gloomy, should have represented death as a pleasing, gentle being; while the Christians, whom religion teaches to look upon death as a release from bondage,—a change from misery to happiness, give him a most frightful said disgusting shape. According to the theogony of Jesied, mesery to happiness, give him a most frightful and disgusting shape. According to the theogony of Hesisal, the god of death was the offspring of Night and the twin brother of Sleep. During the most flourishing period of the arts in Greece, Death was represented on tombs as a friendly genius with an inverted torch, and holding a wreath in his hand; or as a sleeping child, winged, with an inverted torch resting on his street. Step was represented in the same was street. Sleep was represented in the same mann except that the torch and wreath were omitted. According to an idea originating in the East, death in cording to an idea originating in the East, death in the bloom of youth was attributed to the attributes of some particular deity, who snatched his lavourite to a better world. It was ascribed, for real-soes to Jupiter, if occasioned by lightning; to the Nymphs, if by drowning; to Aurora, if happening in the accurage, &c. The representations of death by the Bonisms were less pleasing than those by the Orient; and among their later poets we find death represented under some horible forms, gnashing his teath and marking his victims with bloody nails, a monator extended owing whole fields of buttle. The Habrews had also a tearful angel of death, called Samail and Princet the Wurld.

# Death, Civil

common among Christians, originated in the 14th cen

common among Christians, originated in the 14th dentury. In recent times, however, the success sides of death as a beautiful youth has been revived.

DEATH, CTVIL. (See CTVIL DEATH.)

DEATH, in Theol., is used in a much wider sense than it is no ordinary language, as is also the word life, to which it is opposed. In theological language, there are three kinds of death,—temporal, sprittinl, and eternal, as there are three kinds of life, to which each of these is respectively opposed. The first of these is temporal death, or the death of the body; the second is suiritual death, or the next condition of the soul temporal death, or the death of the pony; the second is spiritual death, or the natural condition of the soul under the power of sin; and the third, or eternal death, denotes the everlasting perdition of the wicked. As Adam introduced death into this world, so Christ, by his sufferings and death, has brought life. He has taken away the sting and power of temporal death, has brought and provided to all the propried to all t has introduced spiritual life, and has promised to all that believe and follow him life everlasting.

DEATH'S-HEAD HAWE MOTH (Acherontia atropos), a lepidopterous insect of the family Sphingide. It is a species of hawk-moth found in several places in England and in nearly every quarter of the globe. Its langth across the wings is nearly five inches; its body is of a yellowish colour, with black stripes; the markings woon the back of the thorax are faint, but hear a close resemblance to a skull or death's head, from which it derives its name. The wings are dark-coloured, being mottled with yellow, brown, and black. The ceterpillar of the death's head moth is greenishyellow; the back is covered with black specks, with transverse lines of blue and white. It is often found feeding upon the leaves of potatoes. The moth itself is mostly seen flying during the morning and evening in autumn. As it flies, it utters a low, plaintive sound, and this, together with the death's head mark upon the thorax, have caused it to be generally regarded with distavour. How it contrives to make the noise is not known. Another strange property possessed by the death's-head hawk-moth, is that it is able to enter and plunder bechives with perfect impunity.

DEATH-BED, LAW OF, IN SCOTLAND.—A man who has burdened or conveyed away his hereditable estate, to the prejudice of his lawful heir, while suffering from disease of which he oventually dies, is held to have seted thus in consequence of inability to resist importunity in his then enfeebled state. His beir may therefore reduce the deed. It is probably referable to the same principle as the prohibition to convey heritage by will, as being designed to protect the dying and their lawful heirs from the rapacity of the priesthood. The legal tests of the amount of vigour are, survivance for sixty days, or unassisted attend-ance at " kirk" or market, though only accomplished for the evadence of the law itself. Death by accident

would, however, validate the will of an already mori-bund man.—Ref. Chumbers's Encyclopedia.

DEATH-WATCH (Anobium tesselatum).—There are certain superstitions that, once rooted in the light soil of a small mind, can never be eradicated or grubbed out by the keenest weapons common sense can bring to bear against them. The insect under consideration is a case in point; and there can be little doubt that this tiny beetle has caused more quaking and consternation than ever did Tigris regalis, or the king of beasts itself. Authors were formerly but ill-agreed as to the insect emitting the delorous ticking. Some attributed it to a spider, others to a wood-louse. It is, however, now generally received as authentic that the "death-watch" is produced by certain beetles the "death-watch" is produced by certain beetles belonging to the timber-boring genus Anobium. The insect in question is of a greyish-brown colour, about a quarter of an inch in length, and moderately thick in proportion: the wing-shells are marked with irregvariegations lighter than the ground-colour. The ticking noise is thus produced :- raising itself upon its head with great force and against a sum of the head with great force and against a sum of the woodwork on which it is standing. The general number of distinct strokes in ancession is from seven to eleven. They follow each other quickly, and are repeated at uncertain intervals. It is said that this insect, if caught and confined on a table, may be taught to knock in reply to a tap of the finger-nail. This training, however, must be a work of some little time, for it is well known

## Debility

that the death-watch, as soon as touched, will contract its legs and counterfeit death, maintaining the imposition even when subjected to a heat flerge enough almost to reast them. The ticking is messely the call of either serie its mate, and may be considered analogous to the call of birds. Says Sir Thomas Brown in his learned. "Facundoxia Epidemica," "He that eguld cradicate this error from the minds of the people would save from many a celd sweat the meticuleus heads of nurses and grandmothers."

DEBATS, de-bait" (Fr. dbat), is a formal swchange of opinious between two or more persons, with the

of opinious between two or more persons, with the view of arriving at some definite conclusion. The The subject is usually treated in a definite manner, and the speakers succeed each other according to certain rules. There is frequently a chairman or president, whose business it is to see that order is maintained. and that the debate is properly conducted. Debate is, even in a greater degree than conversation (whicheet), calculated, if properly conducted, to improve the mental powers. It does so in so far as the heat and vehemence of debate are calculated to excite the faculties to greater statistics than its results. ties to greater activity than is usually the case in conversation. The effort to be sustained is also conversation. greater; the ideas have to be arranged systematically, the words well chosen, and the various forms of exposition, persuasion, and appeal have to be resorted to in order to gain our object. Many roung persons imagine, that in order to train themselves to the art of public speaking, it is useful to adopt that side of the question under debate which to themselves appears the weakest, and thus to display their ingentity in trying to make the best of it. There cannot be a trying to make the best of it. greater mistake. All high eloquence is the offspring of passion or warm emotion; and a man, to be sloquent, must be in carnest, and feel that he is uttering his own sentiments. They will improve themselves to more advantage, and acquit themselves with more honour by choosing always that side of the debate to which, in their own judgment, they are most inclined, and supporting it by what appears to themselves most solid and persuasive. They will acquire the habit of reasoning more closely, and expressing themselves with greater warmth and force, when they are adhering to their own sentiments than when they are speaking in contradiction to them. Neither should one venture to speak upon a subject which he has not studied beforehand; for, in order to speak well, a man must feethat he has his mind made up upon it. A too early adoption of the practice of debate is, however, apt to lead to very reprehensible and often incurable faults, inducing young men of immature judgment and superficial knowledge to advance and adhere to opinions which can only be supported by sophistry, and to con-tend for victory rather than for truth. In this way a habit may be formed, which will not easily be unlearned afterwards, of disregarding right reason and truth, and fair argument. The practice of debate should be preceded not only by general cultivation of the mind. but also by much practice in writing. At first, at least, the substance of what is to be spoken on each occasion should, after reflection, be written down, not in the words designed to be uttered, but in brief heads, so that as little as possible may be left for the speaker to

Trane at the moment, except the expressions.

Defending the deben the expressions.

Defending the expertence of conton-house certificate, authorizing the experter of certain classes of goods to receive the amount of drawback to which he is entitled upon the goods. It is also applied to a deed by which a railway company mort-gages its property for the payment of a certain sum of borrowed money, at the time and under the conditions specified. A debenture is also an instrument by which the government is charged to pay to a creditor or his assigns the money found due on auditing his

DEBILITY, de-bil-e-te (Lat. debilitae, weakness or decay of strength), in Med., is defined to be "that departure from the healthy condition of the frame which consists of a diminution of its vital enerwhich consists of a diminution of its vina ther-gies,—of an enterbing of its powers, manifested in numerous conditions and grades throughout the whole frame, or more or less remarkably in particular sys-tems or organs." It is intimately connected with the nature of most diseases, and often constitutes disease

of itself. Numerous attempts have been made to distinguish or classify the different kinds of debility. The most recent writers regard it—(1) As direct or premary, arising from the abstraction of stimuli, or the operation of contra-stimuli, or such substances as directly onfeetle the organization; (2) judirect, consecutive, or secondary, arising either from exhaustion occasioned by previous excitement, or from increased excitation of an organ occasioning proportionate diminution of the energy of others; and (3) compliexcisions of an organ occasioning proportionate diminution of the energy of others; and (3) complicated debits; consisting nof only of depressed, but of otherwise morbid or viriated vital action. Besides the conditions that characterize general debitity, there are also specifie or partial states of debitity, manifesting themselves more particularly in certain of the tissues, Organs, or systems; as the circulating or nervous system; the organs of digestion or secretion, the cellular tissue, &c. The treatment of debility will always, in a great measure, depend upon its particular form and cause; and these are necessarily so many and varied, that no special directions can be laid down regarding There is, however, a particular class of remedies It. There is, nowever, a particular than the called tonice, which are in general more beneficial than any other, although other articles, as diffusive stimulants and antispasmodics, may often be used with great advantage. Tonics have derived their name from their manufacture that the tone of contractile marks. influence in angmenting the tone of contractile parts, elevating, in a gradual manner, depressed vital power almost up to and seldom or never above the healthy standard. They are also characterized by the perma-nency of their action. Change of air, moderate exercise, agreeable occupation, and pleasant society, are also among the most beneficial means of restoring the depressed or exhausted powers of the frame. Sea-bathing, and in some cases medicated baths, are likewise often of great benefit.—Ref. Copland's Dic-

tionary of Medicine.

DEBIT, deb-il (Lat. debeo, I owe), money due for goods sold on credit or for services rendered. It is generally written debt; but in mercantile language the word is mostly applied to the debit side of an account, which is generally entered on the lett-hand page of the ledger. The term is also applied to the entering of an account on the debtor side of a book; as, to debit the

sum or amount of goods sold.

DEBOUCETING, de-loosh'-ing (Fr. diboucher, from de, from, and bouche, the naouth).—In Min, troops are said to debouch when they emerge from any wood or narrow pass into a plain or open country. The application of the term is obvious from the derivation.

Dinners, dat-bree' (Fr.), a French term which has been generally adopted by geologists, and applied to masses of broken rocks, &c. In ordinary conversation,

the fragments of any fallen building, such as a house

the ingrments of any latter building, such as a house or bridge, are called the debris.

Direct det (Lat. debee, I owe), is that which one person owes to another, whether it be money, goods, or services. In Law, debts are usually divided into debts of record; debts by special contract, and debts by simple contract. A debt of record is a sum of money which appears to be due by the evidence of a court of record, or adjudged to be due on an action at law. A debt by specialty, or special contract, is where a sum of money becomes due, or is acknowledged to be due, by deed or instrument under seal; such as by deed of covenant or sale, by bond or obligation, &c. A debt by simple contract is an obligation depending upon mere oral evidence, or upon notes unscaled; within which class fall bills of exchange and promissory notes. Debt is also a personal action of contract which lies for the recovery of a debt in its technical sense, i.e. a certain amount of money due by one person to arother.

DEBT, NATIONAL. (See NATIONAL DEBT.) DEBTOS AND CREDITOR, det-or, kred-it-or.—The former is one who owes a debt to another, the latter is the person to whom a debt is due. In the early history of every country it will be found that the laws against debters are much more severe than at a later period of its civilization. In rade states of society the creditor was not only entitled to seize the goods of the debtor in satisfaction of the debt, but frequently also he had the power of ensisting the person of the debtor and all who were dependent upon him. We find evidence of this in the early laws of Greece and Rome. The

right of a areditor to sell his debtor was abolished at Athens by Solon. At Rome the debtor was subject to be taken by the creditor to his own house, and there treated in the most cruel manner for sixty days; and if at the end of that time no one stepped forward to release him, he might be sold for a slave. This power of the creditor over his debtor seems to have become practically obsolete, and a milder mode of treatment to have crept in under the emperors. According to the Institutes of Justiniau, a debtor was subject only to les institutes of Justimun, a debtor was subject only to loss of property for payment of his debts. Among the Jews, while the law of Moses admitted of the person of a debtor being sold into bondage, it also provided for his merciful treatment, and enacted a certain time for his being set free. The poor Hebrew was not to be compelled to serve as a bond servant but as a hired servant and as a sojourner, and was to be set free on the year of jubilee, he and his children; and he was to return unto the possession of his fathers. During the feudal period the person of the debtor could not generally be seized for debt, such a proceeding being inconsistent with the duties of military service, to which every man was bound. This was also the case in England at an early period; suits were commenced by a summons, and if the defendant failed to appear, process was issued for the attachment of his property; but in actions upon contract no further remedy was given, either at the commencement of the suit or after judgment. In actions for injuries accompanied with force, it was, however, permitted to issue process for the arrest of the person. By various subsequent statutes the same remedy was catended to other actions in which there was no force; as actions of account, debt, detenue, and actions on the cause. In the court of King's Bench, however, the defendant was, without the mid of these statutes, liable to arrest upon process issued for an alleged trespass, and when arrested he was made to answer for any other cause of action. In the court of Exchequer jurisdiction was obtained by a similar fiction: upon recovery of judgment in any action in which an arrest was allowed upon mesne process, a writ could be issued, called capital estisficiendum, whereby the defendant could be arrested and committed to close custody. Important modifications have recently been made in the laws of debter and creditor.—Sice Banketprex, INSOUTENT,

Indusonment, &c.
Dieut, dai-ba', a French term which has been adopted as an English word. It properly means an opening or beginning, but it is more especially applied to the first appearance in public of an actor or actress. It is also applied to the first appearance at any particular theatre of an actor or actress. In either case the actor is called a débutant, and the actress a débutante.

DECADENCE, de-kai'-dens (Lat. de, from; cadere, to fall), a term applied in the Fine Arts to the decline of any school of painting, or the literature or architecture of any country, from the point at which it may be considered to have reached its summit of perfection. In the Bolognese school of painting (see Bolognese School of Painting (see Bolognese School of Painting), for example, the works of the artists belonging to it reached the highest degree of excellence in the productions of the Carnot, although the Caracci themselves are said to belong to the decadence of the more comprehensive Renaissance school. which culminated in the paintings of Raffaclie, England, architecture, especially church architecture, las been in decadence since the Tudor period, and perhaps, more strictly speaking, from the 14th century, when Gothic architecture attained the highest degree of excellence in this country. But the period of its decadence is now past, and it is beginning to revive again, as well as other branches of art, by the substitution of Byzantine and Gothic forms for the hideous imitations of classic architecture that disfigure the ecclesiastical structures of the 17th and 18th centuries. In Rome, literature attained its highest point in the prose writings of Cicero and the poetry of Horace, Virgil, and Ovid, and the works of other Latin authors of the Augustan era; but when these men had passed away, the decadence commended, and later works in this language are not marked by the elegance and purity of diction which characterized the writings of those who have been mentioned.

## Decagon

Decagon, dele'-d-gire (for, delet, ten; gonta, angle), a geometrical figure which has ten sides and ten angles. When the sides and angles are all equal, the figure is called a regular decagon, and is insuripable in a circle. An irregular decagon, can be founed from a pentagon by describing any irregular tenangles upon its sides, so that no two of them shall have their aideain the same straight line.

DECALOGUE, descalor (Gr. desa, ten, and logos, word), is literally the ten words, a sense which the Hebrewas well as the Greek term bears, and is applied to the law of the ten commandments as given by God to Mouse on Mount Signi. These were written on two tables of stone by the inger of God himself, and were thus different from the other precepts of the law, which were given through Moses; while their being written on "durable tables of stone" serves to denote their ever-binding nature. The Decalegie, like many other por-tions of Scripture, has afforded subject for minute criticism for those that are ever on the search for hidden meanings. Thus, they tell us that the number ten is the symbol of completeness, indicating that they form by themselves an entire whole, made up of the necesry, and no more than the necessary, component parts; that they were written on both sides so as to cover the entire surface, and not leave room for future additions. Much dispute has arisen as to how the commandments were divided on the two tables. It is generally admitted that the first comprehended our duty to God, and the second our duty to man. According to Josephus, however, there were five commandments upon each table, and two and a half upon each side; and Philo-Judieus adopts the same view. The more general view among Christians is, that the first table contained only the first four commandments, and the second the remaining six. But the Roman Catholics, who threw the two first commandments into one, and split the last into swood. The difficulty lies with the fifth commandment ("Honour thy father and mather," &c.), whether it is to be regarded as coming under the head of love to God, or to our neighbour: Christians have generally regarded it as belonging to the latter. Scripture, however, always looks upon parents in a very peculiar light, and very different from what is implied in the general term hiour. It rather regards them as representatives of God, to whom he has delegated a portion of his authority, and for whom he consequently exacts a porunscriptural in the view which places honour to parents due unto himself; and filial obedience as a part of Christian worship. The more closely the commandments of the Decalegue are examined, the more clearly do we perceive their spiritual and comprehensive character, and their suitability for all time. They recognize love They recognize love as the root of all obedience, and hatred as the root of all transgression; and the love that is required is no shallow and superficial thing, finding its development in a few easy external acts, but, on the contrary, it embraces the entire field of man's spiritual agency, and has respect alike to his thoughts, words, and deeds. They comprise a brief but comprehensive summary of all religious and moral duty. In the first table of the law the first and second commandments point to the now the first and second commandents point to the role Godbead, and absolute spirituality of God, requir-ing for himself personally, and for his worship, that place in the heart to which they are entitled; the third demands the due honouring of him in word; and the fourth and lifth the honouring of him in deed. In the second table we are commanded not to injure our neigh-

second table we are commanded not to injure our neighbour,—1, in deed, that is (1), in his person (6th commandment); (2), in his family (7th com.); or (3) in his property (5th com.). 2. In word (9th com.); or in thought (through covetousness, 10th com.).—Ref. Typiographs of Scripture, by Dr. Fairbairn, 1837.

DROINERON, delc-am'e-ron (6r. delca, ten; emera, day), the name given by the Italian poet Boccaccio to his well-known collection of tales. They are supposed to be instrated by a party of guests during a ten days' visit to a villa in the country, while the plaque raged in Roceance in 1849. There are flow works which have had an equal influence on literature with the Decameron. In linguand its effects works which have had the notion of the frame in which he inclosed his tales. the notion of the frame in which he inclosed his tales 623

### Declamation

from it; and, according to Burton, in his "Anatomy of Malanchot," one of the principal amosements of our ancestors was the reading of Boccassic sloud. The first English translation of the Decameron appeared in two

DECASTATION, do kins tail skins (Fr. decayler, to pour off), in Chem., a process of separating the solid and liquid constituents of sciutions, by allowing the immer to subside, and drawing off the latter by means of a siphon. It is resorted to in cases when the asid or alkaline nature of the solution would desirar a paper

or linen filter.

DECAPITATION. (See CAPITAL PURISHERS.) DECEMVIEL, de-sem'-vi-ri (Lat. decem, ten; piri, men), the title of certain magistrates or functionaries in an oient Rome, who were appointed as a sort of commission to draw up a code of laws. Three commissioners were first sent over to Greece, and the principal work of the Decemviri was to collect and digest the information gained by them. After a year's absence, he commissioners returned from Greece, and a wolsent dispute arose between the patricians and plebelans as to which party the decemvir should be chosen from. The patricians gained the day, and the entire government of the state was intrusted to them during the year for which they were to hold office. This form of government proved very successful, and the state was governed with justice and moderation. On the sonclusion of their term of office, a fresh body of decemvirit wise aboves, and the only one of the previous commission who was cient Rome, who were appointed as a sort of communication and the only one of the previous commission who was re-elected was the notorious Appins Cisudius. The new decempiri acted in the most unjust and transical new december acred in the most unjust and expansion manner. Each of the ten was accompanied in public by twelve lictors, who not only carried the rods, but the axe, the emblem of sovereign power. The plebsians were treated with every variety of contumely and outrage, until the unjust decision of Appins Chaudias in the case of Virginia seemed to bring the trygramy to a climar. The december were driven from their office. by a popular insurrection, and the cibunes and ordinary inagistrates of the republic were again appointed. Besides these extraordinary commissions, there were

Besides these extraordinary commissions, there were decenviri chosen for judicial purposes, to preside over and summon the centumviri, and to judge certain causes by themselves. Decenviri were likewise appointed at times to divide lands among the infiltery.

DECIMAL FRACTIONS, destinated frakt channel (Lat. decem, ten), are fractions which have 10, or same power of 10, for their denominator; as one tenth, one housandth, &c. In ordinary practice, it is often convenient to use decimal fractions, which, for the sake of brevity, are not written out fully. The numerator alone is expressed, with a point on the left-hand side: thus, 3 represents \( \frac{1}{2}\_{0.0} \). 30 represents \( \frac{1}{2}\_{0.0} \). 30 represents to have been introduced about the middle of the 15th century, by Regiomontanus. The first treating on the century, by Regiomontanus. The first treatise on the subject was written by Sterimus, in his "Practique d'Arithmetique," published in 1882. They are now generally adopted amongst all civilized nations in generally anopted amongst an averaged materials arithmetical calculations. In many countries the weights, measures, money, &c., are regulated and calculated by decimal division. Many arguments have been used, and many attempts have been made, to introduce a decimal coinage into this country, but

without success.

DECIMATION, des-im-ui-shun (Lat. decem; ten).—In former times, when an army, or any division of an army, had mutined against its commanding officer, and all had equally incurred the penalty of death, punishment was inflicted on the revolted troops by different periods. killing every tenth man, selected by lot, or taken out in the order in which they stood in the ranks. This mode of punishment was sometimes resorted to when a body

of punishment was cometimes resorted to when a body of men had shown cowardice before the energy.

DECES, deks (Ang.-Sax.), a term used in Mar. to denote the floors of a ship. Besides serving as platforms for the people on board, they keep the see and rain from the cargo beneath, and also strengthen the ship by holding her sides together. In large vessels there are several decks; namely, the origin deck, which is the lowest; the lower, or first deck; the middle, or second deck; the appear, or main deck; and the quarter deck.

DECLARATION, del'-lim-ai'-shun (Lut. declamere, to

## Declaration

speak sloud, to declati in public in the town an the Greeks, declarati-ferently on all subjects of making a thing arm pulse summary our test was things, and of pulse sower the best and condest reasons. Among many, a saming m. It was generally restricted is in creation which suboling perform at school, and them be appeal is public. "Declarations." Such as are usually pronounced in a sre, if but sadapted to real cases, and made to account pleadings, of the greatest service, not take our education has still to reach maturity for the series is alice both in conception and in arrange—that even when our studies are said to be combes our education studies are said to be comwas even when our studies are said to be comd. and have obtained us reputstion in the forum; of and have obtained us reputstion in the forum; of any other sort of diet, and is refreshed after fasting by the constant roughnesses of forensic that it is not of the second o shiftle dramatical performances of few scenes respeaking. Declamation forms, or rather we fear we must say would form, a most useful brauch of education, the charge of speech and action, the contract only correctness of speech and action, the contract of the contract of

Decreasion, dek-lär-ai'-shun (Lat. declaratio), Discrimation, dek-lin-al'-shun (Lat. declaratio), a legal specification on record of the cause of action by a plaintiff against a defendant. The declaration should correspond with the process in the names and descriptions of the parties; for if there be a material variance, the court will set aside the proceedings. The plaintiff may declare us soon as the defendant has appeared in wer to the writ of summons, or, where the summons is not specially indorsed, on failure of the defendant to make appearance. The declaration must state to make appearance. The declaration must state clearly the plaintiff a case in one or more counts, each count generally setting forth a separate cause of action. All irrelevant matter is struck out at the cost of the phintiff; and if no appearance is made by the plaintiff after the declaration has been delivered to him or his attorney, the plaintiff may proceed to claim judgment by default. (See Pleading.)—Ref. Tomins' Law Dickmary.

DECLARATION, an asseveration made in place of an oath. From time to time statutes have been enacted to enable Quakers, Moravians, and Separatists to make s solema affirmation that what they say is true, in graing evidence either in civil or criminal cases. False

collections are liable to the penalty of perjury.

Discrimination, Dying, a declaration made by a cross mader the conviction of approaching death. Such declarations are admitted as evidence at a trial, and are often very useful, although, as a general rule, hearing or secondary evidence is not allowed in English law. In cases of murder, the dying declaration of the victum a always admitted as evidence, if it can be proved that the deceased gave the evidence deliberately, and was in presention of his faculties. (See Evingence.)

Declaration, de-klen shun (Lat. declinatio, from decline, I dealine, bend, or deflect), in Gram., denotes the various modifications of number and case to which noins, pronouns, and adjectives are subjected, in order to sincess the relation which one thing hears to other things. To decline a noun, therefore, is to go through its several cases, singular and plural. (See Case, NUMBER, NOUN.)

Present, Notw.)
Descriptions, dek-lin-ni'-shun (Lat. declinare, to insine). The position of a star in the heavens is determined by its right ascension (see Ascension, Histor) and declination, as the position of any place on the earth's surface is determined by its latitude and implification. If we suppose a great circle to passes through any star in the heavens and the north and could pales, being consequently perpendicular to the compact, that portion of the circle which lies between the approach the panafor, whether it be north or south

## Decorated English

Decorated Regilah

to this affect at the life of that adacuterous and skilful
scaller extrem by his son. But shelves this he true or
rote, it is certain that the discovery was made about the
core of the 15th century, as incontestable widence
crists that it was known to the principal maritime
astions of hurope that were engaged in commerce at the
commencement of the century following. When the
commencement of the century following. When the
magnetic needle of the mariner's domplass is disturbed,
it oscillates until it gradually settles, and points sheadily
to two points on the horison, or presinted circle of
the instrument representing the horison, which are
dismetrically opposite to each other. A great circle
passing through these points in a plane-perpendicular
to that of the true horison, represents the magnetic
meridian of the place, while the geographical or astronomical meridian is represented by a great circle also
vertical to the horison, the plane of which pesses
through its true north and south points. These planes
intersect, and are inclined to each other at a small
augle, and this angle indicates the extent of the variation angle, and this angle indicates the extent of the variation or declination of the magnetic needle from the line joining the true north and south points of the horizon. declination may be either east or west, as the magnetic poles happen to be either east or west of the true north. The declination of the needle is constantly warring. In 1581 it was found to be 11° 15′ E. of the true north, from observations made near London; in 1833 it was only 4° 5' E.; while in 1657 it is said to have pointed due north and south; but the authority on which this assertion rests is doubtful. In 1818 it was found to be 24° 30′ W., and in 1822, 24° 12′ W. It seems, then, to be a fair hypothesis that the declination varies albeit. nately to the east and west to about 25° on either side, gradually returning from the maximum of variation on one side to the true meridian, and thence progressing to the maximum on the other side; and from other data given above it would appear that the rate of increase or decrease in the variation averages about 8 or 9' yearly, and that the needle takes about 170 years to arrive at either extreme of variation after pointing due north. But as very little is known, compersitively speaking, of terrestrial magnetism and its causes and effects, no hypothesis respecting the erratio movements of the needle can be received with safety or considered satisfactory. The declination of the needle at any place is so inconstant that it varies even in the course of the day, being sometimes cast and sometimes west of the early sering sometimes east and sometimes west of the mean variation at that place. The variation is ascertained and measured by an instrument constructed for the purpose, called a declinometer, and by the dipping-needle. (See Dipping-NEEDLE.)

DECOCTION, de-kok'-shur (Lat. decogno, I boil), in Chem. the astructure of the adults reserve the

Chem., the extraction of the soluble portions of plants by boiling or heating in water.

y boiling or heating in water.

Decomposition, de-kom-po-zish'-un (Fr. decomposer. to decompose, from Lat. compone, composites). This term is applied, in common parlance, to the separation of the constituents of a substance during patrelaction. In chemistry it is applied to any process during which a compound hody undergoes the separation or

re-arrangement of its elements.

DECOMPOSITION OF LIGHT. (See LIGHT.)

DECOMPOSITION OF FORCES. (See FORCES.)

DECORATED ENGLISH, dek'-o-rai-ted (Lat. decor. I adorn).—This style of Gothic architecture, also known as the Second, or Middle Pointed, or Edward. anown as the Second, or nothing to interest, or account, in, prevailed in England during the 1sth conduct, and was generally adopted in all ecclesiations and public buildings erected in the reigns of fitcher'd L. Edward II., and Edward III.; whence the term Edwardian has been assigned to it by Messra. Garbett and Fergusson. It corresponds with the atyle known as Ogical Secondaire in France, which expension is used in that country to denote the Gothic archithrough any star in the heavens and the north and south pulses being consequently perpendicular to the context of the context posterior of the circle which lies between the storage the equator, whether it be north or south of that irres, is the declination of the star. Declination circles are speall circles from on the celestial globe parallel to the sensitor, similar to lines of latitude on the terrestrial globe.

Decument any star in the heavens and the north or south to the property of the star of the

about the middle of this period. It is a be the most perfect of all the different say architecture. It possessed all the possible commentation of that which immediately commentation of that which immediately preceded in but there was a greater degree of sleguese in the outlines of the former, and more richness in the latter, which was bold and natural in design and execution, without being too florid and claborate, as in the succeeding period. Its chief characteristic features are the windows, the doorways, the capitals of the pillars, and the vaulting of the roots. In the windows the lancet and the valuing of the roots. In the windows he lanced from assumes wider proportions, and instead of consisting of one long narrow pointed light, or two or three of these at the utmost, grouped together and separated by plent, they are broader, and divided into live or more compartments by shafts or multions. The head of the window is still pointed, the area forming it being described either from centres taken without the sides, or from centres taken in the sides themselves, with a radius equal to the span of the window. The tracery of the head consists of cusped circles combined with geometrical curves, which are also foiled or ornamented with cusps. The piers and arches of the doorways are wishly ornamented, the former with light shafts sursounted with sculptured capitals, and the latter with deeply-cut mouldings. Both doors and windows have stones above them resting on corbels, which are frequently carred to resemble heads. Sometimes the moulding of the arch of a doorway is continued through the piers towards the ground, without any break at the impost from which the arch springs. Mouldings of every description are enriched with ball-flowers and Svery assembled are enriched with uni-nowes and bolings, and crockets are used to ornament the angular edges of pinnacles and canopies. The buttresses are bold and highly-finished, and flying buttresses are frequently used. The pillars are formed of groups of light and elegant shafts clustered together, and surveyed the annual property of a bell swelling out mounted by capitals consisting of a bell swelling out to a convex form from the neck-monlding, and deco-sated with foliage and flowers closely copied from the netural forms. The vaulting of the roof is subdivided into patterns, by ribs in different directions interlacing each other, so as to form a kind of rectilineal tracery, and besatifully-carved bosses are fixed at the points of intersection. (See Plate XLL.)

intersection. (See Plate XLL.)
DECOT, de-kot' (Ang. Nor.), a plan by which ducks
and other squatic birds are entired up a narrow channel from a river or lake. This channel usually terminates in a cover of network several yards in length. On either side of the channel the tur' is kept smooth and in good order; this tempts the birds to leave the water, and they alight and begin to dress their pluthage. While thus employed at some distance up the chainel, the decoy-man and his dogs, who have been on the look-out, but carefully concealed, suddenly appear. The birds take to the water again, and are driver by the dogs into the network inclosure, where they are mily captured.

Durans, de-kree' (Lat. decretum, from decerno, I judge), is the decision or order of some competent authority upon some doubtful or disputed point. During the Roman emperors it was usual to submit disputed points to them for their decision, which was called decretium, and became part of the Roman laws. In the Middle Ages, when the pope came to be regarded as the highest authority in ecclesiastical matters, his decisions, in like manner, were received as law, and took the name of decretals. (See Canen Law.) Les, she book the name of decretals. (See Canen Law.) In the lest of England the final judgment of a court of equity is usually called a decree; in Scotland it is applied to the final judgment of any of the courts: in the latter country it is also frequently termed a decreet.

Decress of Gop, in Theol., are the settled purposes of the Emighty, whereby he hath from all eternity: foreordained whatsoever comes to pass. (See Parassers arous)

EDESTENATION.)

Parameters arton.)

Discassive area of the cracking noise, attended with the flying acunder of their parts, made by many minerals and salts when heated. Chloride of section, sulphists of baryte, and several other bodies which contain no water, decrepitate most violently when heated. They separate at the natural joints

Decrepal, (See Decrew, Caron Law.)

Department, dedic infishers (Lais dedice, I works, definite), in Lit., is a complimentary dress to a particular person, profixed by an aut to tils work. The practice score from the si remaineration that in early many from literary labour. Hones suthers as in many cases dependent upon whether in many cases dependent upon whether works peand in whom they dedicated their works peand in whom they dedicated their works peand in the patronage of a p st in early times was to b wany antibors sought the pstronage of a pro-wealthy individual, by dedicating their works It thus came to be a common practice to achie

It thus came to be a common practice to acknowledge a dedication with a sum of money. Pretamately this state of things has ceased to exist, and there's rulent may be said in every case to find itself suitably rewarded by a discriminating public. Dedications have therefore in a great measure passed away, and whose we splitful them, they are generally either a trigon of private friendship or a mark of public exteem.

Dedication is a religious ceremony, whereby a person or thing is solemnly consecrated or act spatt to the service of God and the surposes of religion. The use of dedications is very ancient both among the worshippers of the true God and among the fashire. In Scripture we meet with dedications of the above the garments of the priests. Under Christianity, dedication is only applied to a church, and is naually called the consecration thereof. (See Consecration)

nacle, tomple, altars, vessels, persons, and svenof the garments of the priests. Under Christianity, dedication is only applied to a church, and is amady called the consecration thereof. (See Consecration).

DEDICATION, Frast Of, was a festival observed in the early church on the anniversary of the dedication of any particular church. The practice is said to have been established in England by Gregory the Great, who, in an epistle to Mellitus the abbot, gave injunctions to be delivered to Augustine that the people be allowed liberty on these anniversaries to build beeths and feast round their churches, in lieu of the ancient heathen sacrifices. This festival, or wake, as it was called, was long observed with much entenancy i had it ceased to be hell about the churches, but in private houses. A council held at Orford in 1222 ordained that, among other festivals, the day of dedication of every church should be observed within its preparable. In many places the observance was afterwards transferred to the Sunday following the day of dedication; and in 1536 Henry VIII. enjoined that it be kept in all places throughout the residen on the first Sunday in October. Afterwards the Puritans began to exclaim against it as a remnant of appeary, and popular prejudice was excited against it, so that in many parts it was discontinued. It is still observed in some parts of England, particularly the north and midland counties.—Ref. Hool's Church Dictionary.

Deduction, which consists in rising from particular truth to the determination of a general principle already known. It is opposed to induction, which consists in rising from particular truth to the determination of a general principle affects will fallow. Before we can deduce a particular ruth, we must be in possession of the general truth, which in the same thing agree with one in uses the former kind of truth, is demonstration or science; while truths drawn from the laster kind are contingent and relative, admitting of correction or science; while truths drawn from the l

or science; while truths drawn from the latter kind are contingent and relative, admitting of correction by increased knowledge. The mathematical and metaphysical sciences are founded on addanting the physical sciences rest on induction—Ref. Flemma's Foundation—Ref. Flemma's Foundation—Ref. cabulary of Philosophy.

DRED, dede (Sax. dad), a formal document, a

or parchment, duly signed, scaled, and delivered. When made by one party only, a deed is called a deed when made by one party only, a deed is called a deed poll; when several parties are concerned, an indentare. A deed poll is out even, or golled, at the edges. The form commences in the mode of a declaration,—"Enow all wen by these presents, that," &c. The form appropriated to an indenture, or a deed among several parties, is,—"This indentare, made, &c., bettern, &c., Witnesseth," &c. A properly extragged deed of conveyance usually congust of the following passars—Free.

## Deemstor

the date and names of the parties; are recitals in which the intentions of the p former transactions with regard to the ar-counted as far as necessary. Then the oper countsing of the habondum, which defines or lease reserving rent; the material upon or lease reserving and the parties and the parties are reconsisting of the habendam, which defines the estate or interest to be gravited; the tenendam, usually joined with the laboudamy, but it is unnecessary, since the tenent is more expressed, a recept upon or lease reserving rent; the material upon the tenent material to the parties. or increase to be granted; the communication is usually joined with the independent, but it is nunceessary, since the tenure is never expressed, except upon a sub-grant or lease reserving remy; the suddendum, or the reservation of some new tining, such as rent to the grantor; next some the consistions; if any, annexed to the grantor; next some the consistions; if any, annexed to the grantor; next some the consistions of the consistion, which mentions the exception. As A deed must be signed and sealed by the consistence and by the granter and by the granters are the granters and by the granters are the granters. the granter, and by the grantee also, if any agreement or command is entered into by him. The delivery of a or or smart is entered into by him. 100 dearch, and deed completes its efficacy, and thence it takes effect.

A deed in good although it mentions no date, or has a or impossible date, provided the real date of its delivery can be proved. After execution, a deed may become void by erasure, interfineation, or other alteration in any material part; but, generally, such alterations are presumed to have been made before execution.

Ref. Wharton's Law Lexicon.

Legic. Whatton's Law Legicon.

Detail, deer (Sar. deer) (Ceruus), a Linnæau gen. of ruminant quadrupeds, constituting the family Cerusian The chief characteristics of the deer tribe arcgracefulness of form, fleetness, and neatness and strength of limb; they have a long neck, small head, which is carried high, large full leyes, and large ears; they have no cutting teeth in the upper, but eight in the lower jaw; the males have usually two short canines in the nounce but wither any has my in the lower jaw. They are distinguished from all other runiuants by their branching antiers, or horns, which, in most of the species, exist in the male only. Unlike the horns of the ox, the antiers of the deer are deciduous, fulling off one or, the anyers of the eer are deciduous, inling our every year after the breeding season, and returned before that exciting period again returns. Each year, until the animal attains old age, the horns increase in size both in breadth of palmation and number of branches; when, however, the animal grows so old as to cause to be affected at one season more than another, the horns, although renewed, diminish in size at each It has been clearly ascertained that the size



PALLOW DREE.

and development of the antiers are closely connected with the same of the antiers are those connected with the same of the deer's horns are produced by a sociou analogous to that by which injuries to the bones are repaired. The process forming the base of the berr is covered by a skin, beneath which a sort of indemnation is set up; this produces cartilagious matter, which increases rapidly in amount, gradually be-comes canned, and finally forms the horn, which, when cences confided. But forms the horn, which, when I we or three couples are required, and they are meanly contained, it has been formed. This, however, dries up and pecks aff soon after this complete development of the pressure and the latter then complete development of the pressure and the latter then complete development of the pressure and the latter then complete development of the pressure and the latter then complete development of the pressure and the latter than complete development of the pressure and the latter than complete acting and the line are also supply the head enlarge in the latter than the latte

## De Facto

pever found in localities even where it is certain that hundresis of antiers must have been shed. This, how-ever, is not the only instance of the mysterious dis-appearance of cessons matter. In the torests of Ceylon, appearance of oresone unities. In the forests of Cepton, where hundreds of elephants mans disk in the owners of a single year, the skoiston of that gigantic animal is, as is, related on eminent authority, more found. (See ELEPHANT.) The species of Cervicia are very numerous, and dispersed generally through the world, excepting Australia and the south of Africa. Dear are pretty uniformly clothed with hair longer and thicker on those which inhalt cold than those which inhabit incided. which inhabit cold, then those which inhabit hat the mates. The ancient customs and laws of "veneric." that noble science which our ancestors looked upon as one of the first accomplishments of the high bred not and a knowledge of which was essential to his advanta were formal and technical to a most shourd degree few of the terms betokening the different ages of the stag and hind are still retained, though somewhat altered. The young of either sex is called a calf. After a few months the male becomes distinguished by the growth of the bossets, or frontal protuberances on which the horns are afterwards developed, which, during the first year, are merely rounded knobs; from whence he takes the name of "Knobber." In the ascound year they are longer and pointed, and are called dags, and the animal has now the name of "Brocket." In the third year, the first, or brow autler, has made its appearance, and the deer becomes a "Spayad." In the fourth the bes audier is added, and he is then termed a "Staggard." He is a stag in the fifth year, when the third autier, or "Royal," appears; and in the sixth, third autier, or "Royal," appears; and in the sixth, the commencement of the sur royal, or crown, is formed. when he takes the name of hart, and retains it through his life. At this time he is called a hart or stag of ten. probably because the branches, including the sur royal, irequently amount to that number. After the seventh year he is said to be croched, or pulmed, or crowned, according to the number of branches composing the sur royal. The female is a calf in the first year, brocket's sister in the second, and in the third, and afterwards, a hind.—Ref. Bell's British Quadrupoile.

Dremous, deer none (Meriones), a gen. of Ameri-

can rodent quadrupeds. The deermouse is common in Camada. It is about the size of a mouse, with a very long tail, and very long and slender hind legs. It is capable of making leaps of four or Aveyards. It burrows, and passes the winter in a lethargic state.

DEER-STALKING, stank'-ing (Sax. stateon, to step slowly), a method of hunting the deer in such wild and precipitous countries as render the pursuit of them with dogs and horses impossible. It is a very favourite sport in Scotland, and it requires in the sportsman patience, perseverance, and exertion, being at the same time attended with no slight amount of danger, through the nature of the localities where the game is found. The localities of deer-stalking are principally confined to the Highlands of Scotland, and coursequently embrace some magnificent scenery. stratagems of deer-stalkers to get within reach of their cautious prey are very varied. The extreme wariness cautious prey are very varied. cautious prey are very varied. The extreme wariness of the red deer is such that it requires the atmost circumspection to advance towards them. When they are approached, it must always be done on the leaward. side, as the quick scenting powers of the deer would soon apprise him of the presence of a sportaman who came on the windward side. A circuit of some miles is often necessary, in order that the statkers may approach the deer undetected. After having arrived at the given point, it is often found necessary to gain another completely concealed from the wary sentinel of the herd, one being always especially on the look out to goard the whole against surprise. It is necessary, therefore, that the stalking party in those cases should lie down until the herd have turned into another situation. The best rifles are used in the sport, and the dogs employed are well bred and thoroughly trained to the work. Two or three couples are required, and they exe

### Defamation

has no legal right to the same; in which sense it is opposed to a king de jure (of right), who has a right to a crown, but is out of suspension.

DEPLIMATION, def-d-moi-chus (Fr. diffusier, to define, from Lat. diffusio), in Law, is when a person speaks scandalous things of another, as of a magistrate, whereby the person spoken against suffers in repu-tation. The party so offending is liable to be punished according to the nature and quality of his offence; secording to the nature and quality of his offsee; sometimes by action on the case at common law, sometimes by statute, and sometimes by the coclesiastical laws. In some special cases, defamation is punishable in the spiritual courts. (See Labre, Siander.)

Berauch, de-fault (Fr. defaul), in Law, generally signifies the non-performance of that which enght to have been done. In a special sense, however, it denotes the non-performance in court as a day assigned.

the non-appearance in court as a day assigned. A plaintiff is nonsuited who makes default in appearance in a trial at law; and judgment may be had against a defendant who makes default.

DEFENCE, de-fens' (Fr. defendre, to oppose or deny), in Law, signifies popularly a justification or protection This was, however, not its original signification, as its Tass was, nowever, not us original signification, as its French derivation shows; it merely meant an opposing or denying by the defendant of the truth or validity of the plaintill's complaint. A defence is in reality a general assertion that the plaintill has no ground of action, which assertion is afterwards extended and excitations in the defendant plan.

DEFENDATE, defended in the defendant's plea.

DEFENDATE, defended in the desirable from tendent in a personal action. It is distinguished from tendent, the party sued in a real action. The term defendant is also used to designate the person indicted or otherwise proceeded against for any crime not amounting to felony.

DEFENDER OF THE FAITH, de-fen'-der, a title conferred by Pope Leo X. on Henry VIII, for writing against Martin Luther in 1921. Though subsequently recalled by the pope, it was confirmed by act of parliament, and has ever since been retained by the sove-

reigns of this country.

DEPLADING dessibilities of constructing works of defence, in such a manner both as regards the direction and height of the lines of rampart, that no portion may be enfi-laded, or swept a ong its entire length by a fire from any eminence commanding the fortification, and that the parapet of the ramport may be high enough to prevent the interior from being exposed to the direct fire of the enemy. The former is called horizontal and the latter enemy. The former is called horizontal and the latter vertical defilading. DEFILE, de-file\* (Fr. defiler, to march in file), the name givon in Mil. to any narrow passage, whether it

be a deep valley between two hills, a road between

be a deep valley between two hills, a road between hodges, or even a street, along which troops can only march in column with a narrow front.

DEPINITION, def-e-visib-an (Lat), literally signifies the laying down a boundary, and is applied to the giving or explaining the meaning of a word by means of other words. A definition serves to show what notions are to be included, and, by inference, what to be rejected, in each word; and thus to afford as far as possible, a precise understanding of its meaning. Definitions are usually distinguished into nominal and real; the former merely explaining the meaning of real; the former merely explaining the meaning of terms, and thus belonging to grammers and diction-aries; the latter explaining the nature of the thing itself, and coming within the province of logic. Real definitions are divided into essential and accidental; the former stating the primary and essentially con-stituent parts of that which is to be defined; the latter laying down what are regarded as circumstauces or laying down what are regarded as circumstances or properties belonging to it. Essential definitions are again divided into physical and logical, the former enumerating such parts as are actually separable, the latter the separate ideas in the mind that go to complete the abstract notion represented by the word; namely, the genus and the difference. The conditions of a good definition are:—1. That it be adequate, neither too narrow, and thus only applicable to a part instead of a makely size too extensive, to include a whole instead of narrow, and thus only spheroist or plant in the whole, nor too extensive, to include a whole instead of spart; 2, that it be clearers, e., consisting of ideas less complex than the thing defined; and 3, that it be expressed in a suitable number of words, in opposition person for ever of a dignity or degree of honour. The te prolixity, or excessive brevity. Words expressive of degradations of a peer, priest, knight, efficer, &c., are

## Degradation

ideas purely simple cannot be properly defined, and words expressing less-complicated ideas are from their nature more perspications than those which express the more complex ideas.

DETLACHARION, def-lit-grai-skur (Lat. de, concerning; flagro, I burn), is ordinary language, a rapid combustion attended with flame and vapour. The term, however, is generally applied to the sudden combustion of substances by throwing them into a red-hot

cracible.

Deplexion of Rays of Light. (See Light.)
Devoemery, de-form'-e-te (Lat. deformities, from de, and forma, a form), is the want of that regularity of form necessary to constitute the beauty or symmetry of an object. In the human subject deformities may be either congenital or acquired; i. s., occurring before or after birth. The subject of congenital deformation has recently received from medical men a great degree of attention, and is usually treated of mader the head of Teratology (Gr. teras, a monster, and logas, discourse), a term introduced by Geoffroy St. Hilaire. Formerly various absurd notions were entertained on this subject, and a monstrosity was considered as the presage of some misfortune, the warrant of divine ven-geance, the effect of witchcraft, &c. To these notions they owe their name of monsters, from the Lat. mor strure, to show. Modern rescarch has shown that these deformities are all to be traced to natural causes. which are generally reduced to two main divisions,—1, to the original malformation of the germ; or, 2, to the subsequent deformation of the embryo by causes operating upon its development. To the former class operating upon its development. To the tormer cases are attributed such malformations as are repeatedly produced by the same parents, and hence are in some degree hereditary. Subsequent deformation of the embryo may be produced by various causes affecting its development. A very prevailing opinion is that deformities may be occasioned by strong mental impressions on the much of the female during pregnancy. Of this, however, there is no satisfactory proof, and it is generally discredited by medical men. Deformities, however are frequently moderal by invisical injuries however, are frequently produced by physical injuries suffered by the mother during pregnancy; and hence a strong mental impression may so affect the mother physically as to transmit its effects to the fortus. A third cause is attributed to diseases of the ovum and fotus. A fourth, and assuredly a very general and requent cause of malformation, consists in impeded development of the fætus by some remote and unknown cause. Those who wish to investigate this subknown cause. Those who wish to investigate this subject further will find a long and able article upon it in Todd's "Cyclopædia of Anatomy and Physiology," under the head Teratology. The various kinds of artificial deformities will be found treated of under

their proper heads in other parts of this work.

DEFTER-DAM, def'-ter-dar (Persian), signifies, literally, a book-keeper, and in Persia and Turkey is the title of the minister of finance. In Turkey he site in the divan, disposes of all the public money, and pub-lishes firmans in his own name, without referring to

the grand vizier.

Digitation, deg-loo-tisk-un (Lat. deglutitio, from deglutio, I swallow), is the act of swallowing, or the passage of a substance, either solid, liquid, or gaseous, from the mouth to the stomach. Though simple in appearance, deglutition is yet the most complicated of all the muscular actions that serve for digestion. It is effected by the contraction of a great number of muscles, and requires the concurrence of many im-portant organs for its accomplishment. It is divided into three stages. In the first, the food passes from the mouth to the pharynx; in the second, it passes the opening of the glottis, that of the nasal organs, the opening of the glottis, that of the nassi organs, and arrives at the onsophagus; and in the third it passes through this tube and enters the stomach. The first of these is purely voluntary; the second is not so, but is an action of the reflex function; the third is altogether involuntary, being due to the irritability of the exophagus, which, by a series of muscular contractions and expansions, forces the substance decreases.

all performed with divers beremonies. In the Church of England a clergyman may be denrived of the holy orders which he formerly had, either summarily by werd only, or solemnly, by divesting the party degraded of those robes or ornaments which were the ensigns of his degree. By canon 122, sentence of deposition from the ministry can only be pronounced by the bishop, with the assistance of his chancellor and the dem, if they can conveniently be had, or certain others. In the Romish church the person to be degraded appears before the priest who is to perform the ceremony in his clerical vestments; those parts of the hands which clerical vestments; those parts of the hands which had been anoisted are first slightly scratched with a knile or piece of glass; he is then successively stripped of his sacred or paments and robes of office, is clothed in a lay hebit, and then publicly handed over to the secular judge, who is present to take him under his jurisdiction.

DEGREE, de-pree' (Lat. de, of or concerning; gradue, a step; Fr. dégre'), in universities, is a distinction conferred on the students or members of a university as a testimony of their proficiency in the arts or spiences, and entitling them to certain privileges. The origin of degrees, like many other points connected with the early history of universities, is involved in obscurity. That they existed at a very early period is unquestionable, but there is no reason to believe that they were co-eval with the earliest universities. The oldest degrees were those in arts; and the term bachelor, which designates the lowest degree in each faculty, would seem to justify us in tracing the whole system of degrees to the university of Paris. The terms master and doctor were originally synonymous, and were commonly given to persons engaged in teaching, and not as titles conferred by authority after a prescribed course of study or a formal examination. Afterwards the term master was restricted to teachers of the liberal arts, and the title of doctor was assumed by the teachers of theology, law, and medicine. The masters and doctors afterwards adopted certain regulations, which were confirmed by public authority, to prevent unqualified persons from assuming their office; and hence these titles came to indicate a certain rank, and convey certain powers in the body scholastic. When this took place, and more especially when an initiatory stage was marked by the name of bachelor, the several designations were called steps, or degrees (Lat. gradus). Every graduate had an equal right of teaching pub-Every graduate had an equal right of teaching pun-licly in the university the subjects competent to his faculty up to the rank of his degree, and he even in-curred an obligation to teach as a condition on which his degree was granted. Degrees are of two kinds; I. Ordnary, or those which are conferred upon the members of a university after examination, and are thus certificates of attainment; and 2. Honorary, or those that are sometimes conferred upon persons of distinction without any examination. Degrees bear distinction without any examination. Degrees bear the same names, and, with some variation, the same relative academical rank, in most countries of Europe; remains accommend rank, in most countries of Europe; but the mode of granting them, and their value at different universities as tokens of proficiency, vary greatly. In the English universities there are few artist the degrees of bachelor and master, and for the higher faculties bachelor and doctor. The degree of doctor faculties bachelor and doctor, of the finite manner. faculties bachelor and doctor. The degree of doctor in philosophy, granted by some of the foreign universities, is of modern introduction.—(See Universities, and the several articles on special universities; as those of Cambridge, London, Oxford, &c.)—Ref. Encyclopadia. Britannica, art. Universities.

Degree.—In Math., the circle is divided into 60 equal parts, called degrees; each degree into

60 equal parts, called degrees; each degree into 60 equal parts, called minutes; each minute into 60 seconds, each second into 60 thirds; and so on. (See Cracts, Thiscorometers). In Astron. and Geogr., the imaginary great circles that are supposed to be described on the surface of the earth, and on the apparent surface of the heavens, are similarly divided, to sid us in effecting astronomical and geographical calculations, and in determining the position of stars and other celestial bodies on the latter, and the struction of theses on the former. These divisition of stars and other celestral boutes on the inder-and the situation of phaces on the former. These divi-sions are known as degrees of latitude and longitude, according to the direction in which they are measured. Degrees of latitude are measured from the equator towards the north and south poles, along the meridian,

or any great circle in a plane perpendicular to that of the equator. They are numbered, in either direction from the equator, from 0° to 30°. As the earth is not a complete sphere, the length of a degree of tatitude is not exactly the same at all parts of the earth's surface, being rather less at the equator than at the poles; for being rather less at the equator than at the poles; for all practical purposes, however, they are assumed to be equal everywhere, having a mean length of 60 geo-graphical miles, or 691 English miles, which would be the case if the earth were spherical instead of being an oblate spheroid. The small circles which are sup-posed to be described on the earth's surface through every degree of latitude, in planes parallel to that of the equator, are called parallels of latitude. Degrees of longitude are measured east and west along the equator, from the meridian of Greenwich on the ter-restrial globe, and from the first point of Aries on the celestial globe, and are numbered in either direction from the points that have been indicated from 0° to 180°. Each degree of longitude is 60 geographical miles, or 60°1 English miles at the equator. It may be defined as the arc intercepted between two meri dians or great circles that intersect each other at the poles at an angle of 1°. It will readily be seen, that as the meridians are at 60 geographical miles' distance from each other at the equator, and meet in a point at the poles, the degrees of longitude recome less and less in length as they are measured along every suc cessive parallel of latitude between the equator and the poles. The following table shows the length of a degree of longitude in English miles measured along every fifth parallel of latitude,—the distance at which parallels of latitude are usually inserted in maps of ordinary size. The table is calculated on the supposition that the earth is spherical.

Deg of Lat.	Eaglish Miles.	Deg. of Lat.	English Miles.		English Miles.
0	69:10	; 35	56.51	70	23 60
5	68.81	40	52.85	75	17.88
10 ,	67.95	45	48.78		11.98
15	66:65	50	44.35		6.60
20	64.84	55		90	., 0.00
25		60			
30	59.75	65	. 29.15		

It should be remembered, that in describing the position of a place on the earth's surface we must mention the latitude as north or south of the equator, and the longitude as east or west of the first meridian. In most countries geographers assume the the meridian of the capital as the first meridian.

DEGREE, in Mus., a name given to each line and space contained in the staff. There are nine degrees; viz., five lines and four spaces; when a greater number are required, short parallel lines, called ledger lines, are added, either above or below the staff. A melody is said to proceed by degrees when it ascends or descends to the next line or space.

DEGREE, THEORETICAL, in Mus., the difference of position or elevation between any two notes. retical degrees are of two kinds, viz., conjunct and disjunct; they are called conjunct when two notes are so situated us to form the interval of a second, and disjunct

when they make a third or any greater interval.

DEGREES OF NOBILITY. (See NOBILITY.)

DEI FLATION. (See APOTHEOSIS.)

DEI GRAITA, de-ig-qui-sheo-il (Lat., by the grace of God), is a formula which sovereigns add to their title, and which is taken from an expression of the apostle Paul in the New Testament. It was first used by the clergy in the time of Constantine the Great, as an ex-pression of dependence upon the grace of God, and afterwards the higher clergy came to use along with it the addition, et apostolice sedis (by the grace of God and the apostolic see). In the time of the Carlovin-gian race the secular princes also assumed it; and in course of time it came to be regarded as asserting something like the divine right of kings and their in-

dependence of any earthly power.

Deinachida, dinā-kri-dā, a gen. of the Cricket tribe, abundant in New Zealand, where it inhabits decaying trees and chinks and cramies in old woodwork.

It is carnivorous, and its bite is very severe.

DEIPNOSOURISTS, dipe-nos'-o-fiets (Gr. deipnon, a feast, and sophistes, a sophist), was a name given to

## Deiscal

an ancient sect of philosophers famous for their learned conversation at meals. Athenens has left a collection of Ana, which bears the title of Deipnosophista.

DESCAL, de-is-kal, the name of a ceremony originally used in the Druidical worship of Britain, and consisting of the Druids, accompanied by all the worshippers, ing of the Pruids, accompanied by all the worshippers, proceeding from east to west, according to the course of the sun, three times round the alter. It invariably formed part of the public offices of their religion, and was preserved as a ceremony on various occasions long after Druidism had disappeared. In some parts, even down to a late period, it was customary for the people to testify their respect for their chieftain by restricting this ceremony round his passen.

performing this ceremony round his person.

DRISM, or THEISM, de'-izm (Lat. deus, Gr. theos, God), properly means belief in a God, as opposed to Strictly speaking, the two words are synon-Atherem: Strictly speaking, the two words are synon-ymous, but custom has made a distinction between them, the former being generally used in a bad, the latter in a good sense. In this view a deist is one who latter in a good sense. In this view a deist is one who believes only in a supreme being, rejecting Christianity and denying revelation. A theist, on the other hand, is applied to all that believe in one God. The name of Deist seems to have been first assumed as the denomination of a party by some gentlemen in France and Italy about the middle of the 16th century; and what tany about the middle of the loth century; and Viret, an emineat reformer, in his opisite dedicatory prefixed to the second volume of his "Instruction Chrétienne," published in 1563, mentions certain per-sons who called themselves by a new name,—that of Deists. These persons were desirous of disguising in Lensis. These persons were desirous of disguising in this way their opposition to Christianity under a more honourable title than that of atheist. The first deis-tical writer of any note that appeared in this country was Herbert of Cherbury, who flourished in the 17th century. He was the first to form deism into a system, asserting the sufficiency of natural religion, and hence discarding revelation as uscless and unnecessary. The five fundamental articles of his system were:—1. That there is one supreme God; 2. that he is chiefly to be there is one supreme God; 2. that he is chiefly to be worshipped; 3. that piety and virtue are the principal part of his worship; 4. that we must repent of our sins, and if we do so, God will pardon them; and 5. that there are rewards for good men and punishments for bad men, both here and hereafter. Among the more noted of those who have followed in his steps may be mentioned Hobbes, Blount, Teland, Collins, Woolston, Tindal, Morgan, Chubb, Bolingbroke, Hume, Gibbon, Paine, and, we may add, Lord Shaftesbury. In France, Voltaire, Rousseau, Condorcet, and many others, have rendered themselves compicuous by their deistical writings. Dr. Clarke distinguishes four kinds of deistes —1. Those who believe in the existence of an infinite and eternal being, who created the world withinfinite and eternal being, who created the world with-out-concerning himself with the government of it. 2. Those who believe in the being and natural providence of God, but deny the difference of actions as morally good or evil, which is merely established by human laws, God taking no concern with them. 3. Those who, having right apprehensions concerning the nature, attributes, and all-governing providence of God, yet consider them as of such a nature that we can form no true judgment nor argue with any certainty regarding them, denying the immortality of the soul, and alleging that the present life is the whole of human existence. And 4. those who believe in the existence, perfections, and providence of God, the obligations of natural religion, and a state of future retribution, on the evidence of the light of nature, without a divine revelation. Deism has assumed various forms, usually taking its character from the age in which it was. At one time it denied the historic evidences for the truth of Christianity; at another, the credibility of miracles; again it donied the necessity or possibility of a revelation, and amon the character of the revelation itself. Formerly desim was a rude, repulsive creation, destroying the distinction between right and wrong, depriving man of all hope of a hereafter, and giving him no aim for life but sensual pleasure. Now it has assumed a more pleasing and seductive form. The Bible is indeed a revelation, but it is such a revelation as is to be met with in other works; the writers were inspired, but it is such an inspiration as characterizes men of genius in every age. Minos and Moses were equally inspired to make laws, David and Findar to write poetry, Newton

## Delirium

and Isaiah, Leibnitz and Paul, had each only various forms of the one spirit from God most high. (See In-

forms of the one spirit from Grou most night.

SPIRATION, REYELTOR, RATIONALISM!

DEL CREDERE COMMISSION, del kred'-e-re, is a phrase borrowed from the Italian, and employed in mercenticle law to denote an additional premium charged by a factor or agent, in consideration of which he guarantees and the headman per-

factor or agent, in consideration of which he guarantees the solvency of the purchaser, and thus becomes personally liable for the price of the goods sold.

DRIEGATE, (See DRIEGATION,)
DRIEGATE, COURT OF, del'-c-gails, was formerly the highest court of appeal in ecclesiastical and maritime causes in England. This court was created by Henry VIII. for the purpose of hearing appeals from ecclesiastical courts, a right which had proviously been abled by the none. It was acculad because the indees beld by the pope. It was so called because the judges had delegated to them their powers by commission under the great seal. In ordinary cases, it was composed of three common-law judges and three civilians, but in special cases a fuller commission was sometimes

but in special cases a fuller commission was sometimes issued. This court was abolished by 2 & 3 Will. IV. c. 92, and its powers transferred to the king in council. By 3 & 4 Will. IV. c. 41, its powers are now exercised by the judicial committee of the privy council.

Delegation, del-e-gui-shun (Lat. delegatio, from delega, I refer, or commit to), is properly the investing one with authority to act for another, and has hence come to be applied to a body of persons deputed thus to not. Heaves the present oversity tion of the United to act. Before the present constitution of the United States of America was adopted, the persons consti-tuting the congress at Philadelphia were called dele-gates; and the body of representatives of a state in congress are still called the delegation of a state. In Maryland and Virginia, what in most of the other states is called the House of Representatives is there called the House of Delegates. The name of delegate is also given to the representatives sent to the congress. also given to the representatives sent to the congress of the United States from territories not yet formed into states. In the States of the Church, in Venice, and Lombardy, the term delegazione is applied to the governing court of a province as well as to the province itself. Prior to the recent political changes in Italy, there were nine delegazioni in Lombardy and eight in Venice, each of which was presided over by a delegate, a vice-delegate, and an adjunct. By a decree of 1816 the Papal States were divided into seventeen delegations; but this number has been several times altered. The delegate, according to the old system, must always be a prelate, and is appointed directly by the pope. If a cardinal, he has the title of legate, and his province is called a legation.

DELF, or DELFT, delf, a kind of coarse porcelain, originally manufactured at the town of Delft, in Holland. It has been superseded, even in Holland itself, by the superior manufactures of England, and the improved taste in the making of pottery introduced by Wedgwood. The town of Delft has now entirely lost its reputation for pottery; at present, not more than two hundred persons are engaged in the earthenware

factories.

factories.

Deliquescence, del-e-kwes'-ens (Lat.), the property possessed by certain substances of absorbing water from the atmosphere and becoming liquid in it. Advantage is taken of this property in the case of chloride of calcium, which is much used by chemists for drying gases, and for promoting the crystallization of other less deliquescent salts. The damping of com-mon salt in wet weather is an instance of the deliquescent property of the chloride of magnesium always contained in it as an impurity.

DELIRIUM, de-lir'-e-um (Lat. from deliro, I rave or am furious), is a confusion of ideas, which occurs in the progress of certain diseases, from dicturbed fun-tion of the brain. Sometimes the term is employed to include every form of mental alienation; but generally a distinction is made between insanity and delirium, the latter occurring principally in fever and inflammatory diseases, while the former is unattended by these disorders. (See Insantry.) The insane usually display all the external appearances of health, and have the digestive and nutritive functions in a sound state. In the delirious, on the other hand, all the cerebral functions are severely affected; there are no correct sensations, connected ideas, or passions; no regular voluntary motions; little or no intelligence or

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#### Delirium Tremens

The patient is almost a stranger to everything that surrounds him, as well as to himself. Delirium may be either violent and frantic (delirium Jenium may be enter votent and transc transcripers.), see in acute inflammation of the membranes of the brain, or low and muttering (typhonamis), as in low fever. It supervenes on fever during my part of its course. It cocurs in the hot state of some intermittents, but rarely makes its appearance in typhoid or continued fever until the disease has reached its or continued fever until the disease has reached its height. It sometimes occurs suddenly, without any previous indication; but more frequently it is preceded by headache, throbbing of the temples, a flushed and oppressed countenance, &c. The patient is at first delirious during the short and imperfect periods of sleep, or immediately after he is roused, becoming, when fully awakened, more clear and comparatively collected. By degrees this incid interval becomes less bereentible: the individual becomes more and more perceptible; the individual becomes more and more incapable of reflection and mental exertion, and gradually loses the power of recognizing the persons and to terminate fatally, sensibility becomes more and more impaired, until all conscious feeling seems to be lost. Inarticulate mouning succeeds to delirious incoherence, the patient loses in a great measure sight and hearing; the mouth and tongue are dry, yet the patient no longer complains of thirst; the pupils become scarcely contractile; black spots, like flues, appear before the patient's eye, and the exacuations exceen without consciousness. A deliving is rether a escape without consciousness. As delirium is rather a symptom of disease than a disease itself, its treatment necessarily forms part of that of the disease on which it supervenes, and will therefore fall to be noticed

under these heads. DELINIUM TERMENS, DELIRIUM EBRIOSITATIS, or MARIA A POPU, is a disease of the brain usually caused by an abuse of spirituous liquors, but sometimes also by great mental anxiety and loss of sleep; or it may result from bodily injuries or accidents, loss of blood, &c. Delirium sometimes makes its appearance in consequence of a single debauch; but more frequently consequence of a single account in the interface of it is the result of protracted or long-continued intemperance. It usually supervenes on a fit of interfacion, but it not unfrequently occurs, also, when the habitual drankard omits his accustomed draught. The approach of an attack is almost invariably preceded by the patient being remarkably irritable, with fretfulness of mind and mobility of body. He becomes very nervous and uneasy; is startled by any sudden noise, the opening of a door or the cutrance of a visitor; is restless; the hands and tongue are tremulous; he complains of inability to sleep, and if he dozes for a moment, he is awakened by frightful dreams. Soon delirium manifests itself: if questioned, the patient often answers rightly enough; but if left to himself, he begins to talk or matter; he is surrounded by frightful or loathsome animals; is purstarding the property of the start of the start of the steerible and ghastly visions. Though most commonly of a frightful or terrifying character, the delirium is not always so: occasionally the appearances are droll and Indicrous, and the patient seems amused by them; at other times it turns on some matter of business, as settling of accounts or telling of money, and the patient is in a perpetual bustle, and his hands are constantly fall of business. The predominant emotion with the delirious patient is fear, and in his efforts to escape from an imaginary enemy, he may be guilty of a murderous assault, or, as is more frequently the case, may take his own life; and hence he requires to be very carefully watched. "The strong features of this complaint," says Dr. Watson, "are skeplessness, a busy but not angry or violent delirium, constant chattering, a trembling of the hands, and an eager and fidgety employment of them. . The tongue is moist and creamy; the pulse, though frequent, is soft; the skin is perspiring, and most commonly the patient is drenched in sweat." The delirium continues until the patient sinks into a sleep, from which he awakee comby them; at other times it turns on some matter of

## Delivery

fatal, unless where the etrength of the patient has been seriously impaired by long continued excesses. The great remedy is sleep, and the best means of inducing this is by opium, which is to be given in large doses, and frequently repeated, until the desired effect follows. Sometimes it is necessary, in order to procure sleep, if the patient is in a very exhausted state, or if the disease has been brought on by the creation of an accustment of the contract of the co accustomed stimulus, to allow the patient a certain quantity of his ordinary beverage; but this should not be continued longer than he can do without it. Chloroform has also been recommended as a means of procuring sleep when opium fails. This disease is to be carefully distinguished from inflammation of the brain, with which if her name armorous in comment. with which it has many symptoms in common; for bleeding, which is resorted to in the latter disease

would be of the utmost danger in this.

DELIVERY, de-liv'-or-e (Fr. déliver, to deliver), is the fifth and last of the several parts that go to make up the business and art of the orator, the others being invention, disposition, embellishment, and memory: invention, in order to find out what to say : disposition, invention, in order to find out what to say; disposition, in order to strange in a proper manner; embellishment, to deck it in proper language; memory, to retain it; and delivery, to give it forth with dignity and grace. The ancient masters of oratory looked upon delivery as occupying a most important place in the art. It is said of Demosthenes that when asked what was the first point in contract, he would be supported to the said of first point in oratory, he answered, delivery; and the second, delivery; and the third, still delivery. "Delivery," says Cicero, "has the sole and supreme power in cratery. Without it a speaker of the highest mental capacity can be held in no esteem; while one of moderate abilities, with this qualification, may surpass even those of the highest talent." Though, from the Though, from the character of the people and of the times in which we live, delivery may not now be entitled to the same attention that it formerly received, yet it only requires a little consideration to see that it is one of importance to the public speaker, and is entitled to a much greater degree of attention than it at present receives. If the end of all public speaking is to persuade,-to convey our own ideas and emotions to those whom we address, then our voice, looks, and gestures interpret our ideas and emotions not less than words do,-nay, the impression they make upon others is frequently much greater than any words can make. An expressive look, a passonate cry, often speak much more eloquently than any words. Words are only arbitrary conventional symbols of our ideas; but tone and gesture are the language of nature. "Every emotion of the mind," says Cierro, "has from nature its own peculiar look, tone, and gesture; and the whole frame of a man, and his whole countenance, and the variations or his voice, sound like strings in a musical instrument, just as they are moved by the affections of the mind." Apper, for instance, assumes a parof the mind." Anger, for instance, assumes a particular tone of voice,—acute, vehement, and with frequent breaks; violence has another tone, strained, quent breaks; violence has another tone,—strained, vehement; impetuous, with a kind of forcible excitement; fear is desponding, hesitating, abject; lamentation and bewading, flexible, full, interrupted, in a voice of sorrow; pleasure, unconstrained, mild, tender, cheerful, languid; trouble, a sort of gravity without lamentation, oppressed, as it were, with one heavy uniform sound. "On all these emotions a proper gesture ought to attend; not the gesture of the stage, expressive of mere words, but one showing the stage, expressive of mere words, but one showing the whole force and meaning of a passage; not by gesticulation, but by emphatic delivery, by a strong and manly exercise of the lungs; not imitated from the theatre and actors, but rather from the camp and the palestra." The first great object with every public speaker should be to speak so as to be fully and easily understood by all who hear him; and in order to this, the four chief requisites are a due degree of loudness and creamy; the pulse, taongn frequent, is solt; the cour chief requisites are a due degree of loudness skin is perspiring, and most commonly the patient is discussed. The delirium continues until the patient sinks into a sleep, from which he awakes comparatively rationals, or dies from exhaustion. In such cases death is often sudden, the patient rising for some trivial purpose, and falling in a faint, from which he never recovers; or at length, after passing many pights without sleep, he sinks into a state of come, which the suddent thing in a speaker is diswitted the comparatively such as the four chief requisites are a due degree of loudness skin is to exhibit the patient in the four chief requisites are a due degree of loudness of vice is doubtless, in good patient sinks into a sleep, from which he availes comparatively rationals, or dissinct on the four chief requisites are a due degree of loudness of vice, distinctness, allowness, allowness, and propriety of pronunciation. Power of voice is doubtless, in good patient sinks into a sleep, from which he availes comparatively rationals, or dissinctness, allowness, allowness, allowness, and propriety of pronunciation. Power of voice is doubtless, in good to receive the four chief requisites are a due degree of loudness of vices, distinctness, allowness, allowness, allowness, and propriety of pronunciation. Power of voice is doubtless, in good to requisite the four chief requisites are a due degree of loudness of vices, distinctness, allowness, allowness, allowness, allowness, allowness, allowness, allowness, allowness, and propriety of pronunciation. Power of voice is doubtless, in good to receive the four chief requisites are a due degree of loudness of vices is doubtless, in good to receive the four chief requisites and receive of loudness.

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#### Delphin Classics

pronounces, be distinctly heard; and attention to this will do more to compensate for loudness than is commonly imagined. In the 'third place, slowness of speech is to be studied; for the opposite confounds all articulation and all meaning. It gives weight and dignity to the discourse, and is of great assistance to the voice, by the pauses and rests which it affords. It also assists the speaker in preserving a due command of himself; whereas a rapid and hurried manner is apt to excite that flutter of spirits which is the greatest enomy to correct delivery. The speaker must, in the fourth place, attend to propriety in pronunciation, or the giving to every word which he utters that sound which the most polite usage of the language appropriates to it. There are other points that require to pronounces, be distinctly heard; and attention to this priates to it. There are other points that require to be attended to by all who would speak with grace and force, so as to please and move the audience; the chief of which are emphasis, pauses, tones, and gestures. On the right management of the emphasis depend the whole life and spirit of a discourse; and by an abuse of emphasis the meaning is often rendered ambiguous or perverted. In order to acquire the proper management of emphasis, the great rule is for the speaker to study to attain a just conception of the force and spirit of what he is going to say. The most frequent and principal use of pauses is to mark the divisions of the sense, and, at the same time, to allow the speaker to draw breath; and the proper adjustment of them is one of the nicest and most difficult accomplishments in delivery. Tone consists in the modulation of the voice, the notes or variations of sound which we employ in public speaking. Of the importance of this we have already spoken. A speaker cannot successfully convey his own sentiments and emotions to his hearers, unless he utter them in such a way as to show that he feels them. The great rule here is to follow nature, and to consider how she teaches us to utter any sentiment or feeling of the heart. Gesture, or action, as it is frequently termed, is of great importance to the orator. "Action," says Cicero, "which, by its own powers, displays the movements of the soul, affects all mankind," and "the countenance is next in power to the voice, and is influenced by the motion of the eyes. The great rule here, as in the previous case, is to attend to the looks and gestures in which earnestness, indignation, compassion, or any other emotion, discovers itself to most advantage in the common intercourse of men, and to take these for our models. For farther information on this subject, we may refer to the Institutions of Quintilian, who, in the last chapter of the eleventh book, has given many particular rules concerning gesticulation, which modern writers have done little else than translate.

DEFRINCLASSICS, del'-fin, in Lit., is the name given to an edition of the Greek and Roman classics, prepared and commented upon by thirty-nine of the best scholars of the day, under the editorship of Bosauct and Huct, at the instigation of Lonis XIV., for the benefit of his son the dauphin (in usum Delphin); whence their name. Many of the particular works have been reprinted in this country, and are well known.

DELPHINIUM, del-fin'-e-um, in Bot., a gen. of plants belonging to the nat. ord. Rannaculacea. The seeds of D. staphysagria, commonly called staves-acre seeds, have been used for destroying vermin. They contain an alkaloid called delphinia, which is occasionally employed medicinally as an external remedy in rheumatism and neursigia.

DELPHINUS, del-fil-nus (Lat. delphinus, the dolphin), one of the original constellations made by Aratus, an old Greek astronomer. It is close to the constellation Aquila. Its brightest star is one between the third and fourth magnitude, and it has four of the fourth magnitude.

DRITA, del'-tá, the Greek letter A.—The lower portion of Egypt, between the eastern and western branches of the Nile and the sea, was, from its resemblance to the letter above, called the Delta. In modern times, whenever a river, before entering the sea, diverges so as to form a triangle, with the sea-line for the base, the alluvial deposit included by the three lines is called a delta. The existence of a delta at the mouth of a river depends not so much on the amount of sediment held in suspension as on the presence or

# Deluge

absence of currents met with at the point of discharge. Deltas are not to be found where there are strong ebb tides; in such case deposit is washed away. But in sheltered bays and gulfs, in the Mediterranean Sea, where there are scarcely any tides, and in inland lakes, deltas slinost invariably occur.

deltas almost invariably occur.

Detroop, del'-toid (Gr. A delta), in Anat., is a muscle of the shoulder, which moves the arm either forward, backward, or upward. It is so called from its resemblance to the Greek letter delta. In Bot., the term deltoid is applied to a leaf of triangular form.

DELUGE, dell'suje (Lut. diluoium), is either a partial or general overflow of water, flooding the land. It is generally applied to that great overflow of water narrated in Scripture, and commonly known as the Flood. This great event is ordinarily calculated to have occurred in the 1656th year after the Creation, and 2293 years before Christ. We are told in Genesis (vii.) that all before Christ. We are told in Genesis (vii.) that all the fountains of the great deep were broken up, and the windows of heaven were opened, and God caused it to rain forty days and forty nights upon the earth; that during that time the waters increased and pr vailed exceedingly upon the earth, and all the high hills and mountains were covered fifteen cubits and up-wards; that all flesh died that moved upon the earth, wards; that an less due that moved upon the sard, and every man save Noah and those that were with him in the ark; that the waters prevailed upon the earth an hundred and fifty days, and at the end of that time they were shated, God having made a wind to pass ever the earth and assuage the waters; the fountains also of the deep and the windows of heaven being stopped, and the rain from heaven restrained. Noah entered the ark on the 17th day of the second month; on the 17th day of the seventh month the ark rested upon the mountains of Ararat, and on the 1st day of the first month of the year following, the waters were dried up from the carth, and about two months later the earth itself was dried. Such is the concise account of this great catastrophe given in sacred writ, a subject which has given rise to much discussion, and furnished materials for the cavillers at religion. Without going into all the points connected with this subject, we may briefly allude to a few of them. the legends and traditions of most of the earlier races upon the earth (the Chinese, Hindoos, Persians, Greeks, &c.) accounts of a similar catastrophe, and though sometimes they are in an allegorical form, yet they so closely resemble the account given by Moses, that they have generally been regarded as referring to the same event. Even the Mexicans, Peruvians, and other ruder nations of the new world, are represented as baving their traditions of the great deluge. rous ingenious and fanciful theories were formerly given forth in order to explain the phenomena of the Deluge; and early geologists believed that they found in the fossil remains imbedded in the earth unquestioned evidence of this universal destruction. So far was this the case, that infidel writers found themselves reduced to the absurd shift of representing them as lumin nature. So far as the testimony of geology goes, we have no evidence that bears directly upon this subject. Some of the ablest geologists are of opinion that the Deluge as described by Moses had been so gradual and of so short duration that it could have produal and of so short duration that it could have produced comparatively little change upon the surface of the earth. "The simple narrative of Moses," says the late Dr. Fleming, of Edinburgh, "permits me to believe that the waters rose upon the earth by degrees; that means were employed by the author of the calmity to preserve pairs of the land animals; that the flood exhibited no violent impetnosity, displacing neither the soil nor the vegetable tribes which it supported, nor rendering the ground unfit for the cultivation of the vine. With this conviction in my mind, am not prepared to witness in nature any remaining am not prepared to witness in nature any remaining marks of the catastrophe; and I find my respect for the authority of revelation heightened when I see on the present surface no memorials of the event." The majority of the ablest scientific men and theologians are now, however, of opinion that the Flood was enly partial, and not universal. It was sent as a judgment of God against impious men, and there is no reason to believe that the human race had then spread themselves over the entire surface of the globe. The word all, in accordance with Eastern phraseology, is not always in

Demi

Scripture to be taken in a strictly literal sense; and hence, in the Mosale account, there is nothing that can be regarded as contrary to the view of the Delugo being only partial. The object to be effected was the destruction of ungodly men, and if there be no reason to conclude that they were at that early period extensively scattered abroad, we think there is abundant evidence to abow that God is always very economical of his means, and never has recourse to great measures in order to effect what may be brought about by small. The opinion of a partial deluge has been taken up and developed by Hugh Miller in his last great work, the "Testimony of the Rocks." "There is," he says, "a subject to the state of the says, "a subject to the "There is," he says, "a remarkable portion of the globe, chiefly in the Asiatic continent, though it extends into Europe, and which is nearly equal to all Europe in area, whose rivers (some of them, such as the Volga, the Ural, the Sihon, the Koor, and the Amoo, are of great size) do not fall into the cosan, or into any of the many seas which surround it," but lose themselves in the eastern part of the tract in the lakes of a rainless district, and in the western fall into seas such as the Caspian and the Aral. In this region there are extensive districts still under the level of the ocean. "Let us suppose," he continues. "the human family still amounting to sevewars and exhausting view, were congregated in that tract of country which, extending eastward from the modern Aranat to far beyond the See of Aral, includes the original Caucasian centre of the race. Let us suppose that the hour of judgment having at length arrived, the land began gradually to sink, as the tract in the Run of Cutch sank in the year 1819, or as the tract in the southern part of North America, known as the Sunk Country, sank in the year 1821. Further let us suppose that the depression took place slowly and equally for forty days together, at the rate of about four hundred feet per day, a rate not twice greater. the original Caucasian centre of the race. four hundred feet per day, a rate not twice greater than that at which the tide rises in the Straits of Ma-gellan, and which would have rendered itself apparent as a persistent inward flowing of the sea. Let us further suppose that from mayhap some volcanic outburst coincident with the depression, and an effect of the same deep-seated cause, the atmosphere was so affected that heavy drenching rains continued to descend during the whole time, and that though they could contribute but little to the actual volume of the flood, at most only some five or six inches per day, causes, and added greatly to its terrors, by swelling the rivers and rushing downward in torrents from the Euxine Sea and the Persian Gulf on the one hand, and to the Gulf of Finland on the other, would open up, by three separate channels, the fountains of the great deep, and which included, let us suppose, an area of about 2,000 square miles each way, would at the end of the fortieth day be sunk in its centre to the depth of 16,000 feet, a depth sufficiently profound to bury a gradient of declination of but sixteen feet per mile, the contour of its hills and plains would remain appa-rently what they had been before. The doomed inha-bitants would see but the water rising along the mountein sides and one refuge after another swept away, peared; and when, after 150 days had come and gone, the depressed hollow would have begun slowly to rise, and when, after the fifth month had passed, the ark would have grounded on the summit of Mount Ararat, all that could have been seen from the upper window that could have been seen from the upper window and mould be simply a boundless see, rough cared; and when, after 150 days had come and gone, of the vessel would be simply a boundless sea, roughand the vesses would be simply a boundless sea, rough-ened by tides now flowing outward with a reversed course toward the distant ocean by the three great outlets, which, during the period of depression, had given access to the waters. Noah would of course see that the fountains of the deep were storned and the that the fountains of the deep were stopped, and that the waters returned from off the earth continually; but

its original and proper signification; but it came afterwards to be applied in a bad sense to such as attempted wards to be applied in a bad sense to such as attempted to mislead the people, and gain them over to their own selfish views, and who did not hesitate to resert to deceit and falsehood for that purpose. In its original acceptation it was regarded as a most honourable designation, having been applied to Solon, Demosthenes, and others of the most illustrious men of antiquity; but it is now almost invariably used in a bad

production on the part of the buyers, in order to enable them to purchase what they are anxious to obtain. Hence a universal increase of production leads to a corresponding increase of consumption. The relations between the demand for an article and its supply determine its price, which will rarely vary, for any length of time, much above or below its cost of production. Though the first effect of a demand exceeding the supply of a commodity is to raise its price, yet the in-creased price attracts the competition of others, and fresh labour and capital are employed in its production, until the supply is accommodated to the demand or exceeds it. In some cases, however, where the supply is necessarily limited, the price rises in proportion to the deficiency, and the number of consumers is diminished. Where, as in articles of food, the demand is universal, the effect of a deficiency is to raise the price higher and higher until a fresh supply can be obtained. The general effect of lowering the price of an article is to increase the amount of consumption, and of raising the price to diminish it. supply of any article exceeds the demand, the reverse of all this takes place, and the prices generally fall in proportion to the excess of the quantity. An excessive production of any commodity is always attended with evil to the producers, who aust either cease to produce or must produce in less quantities: and not only does it act injuriously upon them, but extends also to other classes, inasmuch as the consumption of these producers is diminished. "In proportion to the extent of the is diministed. In proportion to the extent of the market, and the variety and abundance of commodities to be exchanged, will be the facility of disposing of the products of capital and labour; and this consideration points out as the most probable autidote to gluts, a universal freedom of commerce. When the free interchange of commodities is restricted, not only is a glut caused more easily, but its causes are more uncertain. and dependent upon unforescen events. With the whole world for a market, the operation of the laws of demand and supply would be more equable, and the universality of the objects of exchange would make gluts of rare occurrence."—English Cyclopædiu, sect.

gluts of rare occurrence. — any many facts and Sciences.

Demarcation, Line of, de-mar-kai'-shun (Fr.), in the language of politics, is applied to the line or boundary agreed on by two contending parties, or fixed by a third, regarding some disputed territory. The term originated in the 15th century, when Pope Alexander VI., in order to settle the disputes of Spain and Portnaul on the subject of their Indian possessions.

and Portugal on the subject of their Indian possessions, drew an imaginary line through the ocean, defining the possessions of both parties, and to this line the term demarcation was first applied. It has now come to be used in this sense in most of the languages of Europe, DEMESKE, de-mech' (Nor. demainer, demayne, probably from Lat. dominium), such lands as were next to the lord's mansion, which he retained in his own hands for the use of his household and for hospitality. At the wreaper day. demans signifies the right which the waters returned from off the earth continually, but whether the deluge had been partial or universal he could neither see nor know."

Demagogus, leader), was applied, in ancient Greece, to such persons as by their abilities had great power in gaining over the mass of the people to their views, and thus obtained great influence in the state. This was applied, in ancient Greece, to gaining over the mass of the people to their views, and thus obtained great influence in the state. This was applied, in an of requently used in

the composition of English words; as demigod, helf-god.

Bangon.

Danzgons, dem'-e-gods, in Greek and Roman Myth., were a kind of half-gods, an inferior kind of deities, who were regarded as having something earthly in their composition. They were generally the spirits of such men as had been deified, more particularly such of them as were regarded as the offspring of divinities and mortals.

DEMI-HAQUE, dem'-e-hak (Fr.), the name of a small firearm in general use about the end of the 15th century. It was like a large pistol in form; but the butt was long and greatly curved. It was, as the name implies, a diminutive of the haquebut, or hook-butt, a musket the stock of which was curved, instead of being straight like that of the arquebus or hand-gun, the shape of which prevented these weapons from being held in a position which would allow the eye to be

the snape of which present these waspons roll being held in a position which would allow the eye to be directed along the barrel towards the object aimed at.

DEMI-IUMA, dem'-e-lune (Fr. demi, half; lune, the mion), in Mil., the name sometimes given to the ravelin, a work erected beyond the main ditch, in front of the curtain, to defend this part of the fortification and the flanks and shoulders of the collateral bastions. It is composed of two faces, forming a salient angle towards the open country, and is surrounded by a ditch communicating with the main ditch. It is open towards

the rear, and gained by a caponnière thrown up across the ditch in a line perpendicular to the curtain.

Draise, de-mize' (Fr. démise), a term applied to the conveyance of an estate, either in fec, or for life, or years. The king's death is, in haw, called the demise of the king to his royal successor. In England, according to public law, "the king never dies;" for immediately the death of the reigning monarch occurs, the Sovereignty passes to his successor; no ceremony or instal-lation is required, the successor becoming monarch by the act of the law itself. Blackstone thus writes of this custom:—"So tender is the law of supposing even a possibility of his death, that his natural dissolution is generally called his demise, an expression which

is generally cancer in termise, an expression when signifies merely a transfer of property."

DEMIURGE, dem'-e-urj (Gr. demiourgos, from demos, people, and ergon, work), is literally a workman or handicraftsman, and was employed by the Gnostics to denote a being whom they regarded as the creator of the visible world. He was, in their view, the archon or chief of the lowest order of the spirits in existence prior to the creation of this world; and it was he, they

prior to the creation of this world; and it was he, they said, that, by contact with chaos, gave to this earth its form and living characters. From him man received his psyche, or sensuous soul; while from God, the supreme divinity, he received his higher spirit, or pneuma. In this way they attempted to account for the existence of a good and evil principle in man, and for the origin of evil in the world. (See Gnostics.)

DEMOGRACY, de-mok'-rö-se (Gr. demos, and kratee, 1 rule or govern), is usually defined to be a government in which the whole of the people, or a great proportion of them, exercise the sovereign power, either directly or by means of representatives. Among the Greeks, from whom we have received the term, it denoted a government in which the svereignty was exercised by the great body of the citizens. It was also necessary to a democracy that the majority of the also necessary to a democracy that the majority of the citizens be of the poorer class; for, according to Arissotle, if a considerable majority of the citizens are rich, and exclude the remaining body, who are poor, from political rights, this is not a democracy. A pure political rights, this is not a democracy. A pure democracy is when every adult male citizen of sound mind has an equal share in the sovereign power. Such a condition could only exist in very small communities, as were the states of ancient Greece; and in modern times we have examples of it in some of the Swiss can times we have examples of it in some of the bwise can-tons, where all public business is discussed in a full assembly of the people. It thus became necessary to have recourse to delegates or representatives, elected by the people for the purpose of carrying on the government, and invested with powers for that purpose. So long as these are held responsible to the sovereign Bo long as these are not responsible to the sovereign body by whom these powers are delegated, this is still a democracy, though it is awdently less pure than the other, as the will of the people is only indirectly exer-dised, and is hence liable to be misrepresented or trossed. Even if the sovereign power should only be

in the hands of those who were possessed of a certain amount of property, if these should constitute the great majority of the people, this would still be called a democracy. The best form of government for any particular state is that which is best suited to its condition. dition. In some cases a monarchy, in others an olidition. In some cases a monarchy, in others an objectory, and in others a democracy, may be the best; but the ideally perfect form of government,—that which is best adapted for a people in its highest state of development, is the democratical, eating in its most practicable form, i.e. by representatives. We believe that not only does it produce the best form of government, and establishes it upon a firm basis, but that it also acts most hearticially in devaloning the intellectual ment, and establishes it upon a firm basis, but that it also acts most beneficially in developing the intellectual and moral qualities of the people. Hence the importance of a gradual and steady extension of the rights of government till they reach all classes of the people. The principle of democracy is that of equality, and of every member of a community being emittled to svoice in the affairs of that government of which he is a subject. In order to this however, it is necessary that in the anairs of that government of which he is a sub-ject. In order to this, however, it is necessary that he give satisfactory evidence that he is possessed of a sufficient degree of intelligence and integrity to exer-cise this power aright, and not use it merely for the furtherance of private or party ends. In a well-formed democracy, each one ought to see clearly what the true interests of the state are, and seek to advance them, So low as one clear or narty fancies that it is few the So long as one class or party fancies that it is for the interest of the state that another class or party be kept in check, and if one of these parties must have the rule, history has always shown that it is best in the hands of the anistocracy. It may be, however, that the party feeling is so strong, and their power so equally balanced, that neither of them can obtain the rule, or neither of them may possess the ability, though they had the power; then an intelligent monarchy, even though it may be an absolute one, is undoubtedly the best for that people.

Drmon, de'-mon (Gr. daimon), was the name given

by the ancients to certain spirits or genii, which they regarded as intermediate between gods and men. According to Plato, the name is derived from daemon, knowing, in allusion to their superior intelligence. Homer and some of the earlier of the Greek writers applied the term generally to every order of being superior to man; hence the gods were sometimes called demons, and the adjective daimoniakos was used to signify divine. In Hesicol we have an express account of the demons, as spirits intermediate between gods and men, being the souls of men who had lived in the golden and silver ages, and of whom there were different orders. According to Plato, the demon is a middle intelligence between the gods and men, watching over, directing, and recording the actions of the latter. In the opinion of some, the celestial deities did not at all interfere in the management of human sffairs, but committed it entirely to the care of the demons; and that every mortal at birth received a particular demon, who accompanied him through life and acted as his guiding spirit. According to their influence, demons guiding spirit. According to their innumes, demons were distinguished as good and bad,—agathodemons and cacodemons (Gr. agathos, good, and kakos, bad); but in either case they were regarded as carrying out the intentions of the gods, and not as being in any degree hostile or opposed to them. Hence, in its original sense, a demon was not necessarily an evil spirit, an idea which has come to us from the Jews, who were wont to regard the deities of other nations as only embodiments or emissaries of the Evil One. The genii of the Romans were analogous to the demons of the Greeks, though they differed from them in many important particulars. Every individual was believed at birth to receive a particular genius, which accompanied him through life, and conducted him through its various vicasitudes. The genius was rethrough its various vicissitudes. The genius was re-presented as enjoying the good things of this life; and hence for one to pinch his appetites was to defraud his genius. It was generally believed that each person genius. It was generally believed that each person had two genii,—a good and a bad; and as the one or the other prevailed, so was his conduct good or the reverse. Places and cities, as well as men, were believed to have their particular genii. The origin of the doctrine of demons is to be sought in the Rest. The Hindoos associated with their supreme deity, Brahms, an innumerable host of messengers or demons,

# Demoniacal Possession

called deitjus; and the Persians still further developed and systematized this doctrine of subordinate spirits. In accordance with the dualistic principle of their religion, they had two kinds of dentons—those who were servants of the good principle, or Ormusd, and were called Izeds, or genii of the Light, and those who served the evil principle, Ahriman, and were called the Dews, or genii of Darkness. The Jews, at the time of the Babylouish captivity, doubtless became acquainted with the system of the Persians; and to this may perhaps be attributed many of the popular notions that were afterwards held by them on this subject. Among Christian writers demons are simply fallen ancels, or doubt a contract of the contract and systematized this doctrine of subordinate spirits. subject. Among Christian writers demons are simply fallen angels, or devils, as used in the New Testament; and demonology is thus a discourse on the supposed nature and properties of such evil spirits, and of the superstitions regarding them. (See MAGIC,

WINCHCHAFT.) DEMONIACAL POSSESSION, de-mon-i'-a-kal, is one of these questions that has occasioned a great deal of discussion, and which, to Christians, has presented no fow difficulties. We do not indeed sympathize much with those who would bring everything to the touchwat those who would bring everything to the touch-stone of their own imperfect reason, and who cannot be made to believe in anything that is not perceptible to the senses; yet there are difficulties connected with this question that necessarily keep one from speaking with any degree of certainty regarding it. The question is, whether, when Christ was upon the earth, wicked and impure spirits were permitted to take up their abode in the bodies of human beings, directing, con-trolling, and tormorting them. Those who hold that trolling, and tormenting them. Those who hold that this was not the case, maintain that the appearances which characterized those said to be possessed, do not differ in any particular from what we observe in certain diseases in the present day; that such beliefs were common to the age and people among whom Christ was; and that he, when speaking of demons, merely conformed his language to their understandings, and spoke so as to be understood by them. On the other hand, it is a supple of the conformed his language to their understandings, and spoke so as to be understood by them. On the other hand, it is the conformed his language to the conformed his language to their numbers. it is argued that the appearances were such as showed that the demoniacs were not mere lunatics, or epilep-tics; that they knew Christ, and acknowledged him to be the Holy One of God; that Christ himself addressed them as unclean spirits; and that the account of the demonsentering the herd of swine cannot be accounted for in any other way. The question is beset with diffi-culties; but we do not think it a conclusive argument against demoniacal possession, that because we have no evidence of it in the present day, therefore it could not base existed at any previous time, or under any other circumstances. We are sufficiently ignorant of the apprit world that we may well speak with caution as to its nature and powers. There are numerous still units nature and powers. There are numerous still un-solved questions relative to the connection that subsists between mind and matter; we see, even in recent times. old forms of disease disappearing, and new and pre-viously unknown diseases taking their place; and lastly, the doctrine of demoniacal possession is con-sistent with the whole tenor of the sacred Scriptures. People would do well to bear in mind the inscription on La Motte's sundial, when attempting to speak authoritatively on such subjects,—" Quand je ne vois pas clair, je metais," When I do not see clearly, I am silent. In je metais," When I do not see clearly, I am silent. In

the early ages of the Church there was a peculiar service appointed for the cure of demoniaca.—Ref. Farmer's Essay on Demoniacs; Moses Stuart's Sketches of Angelology, in Bibliotheca Sacra, 1843.
DEMONSTRATION, demonstrati-sham (Lat. demonstro, I show or point out), was used by the old English writers to denote any manner of showing either the connection of a conclusion with its premises, or of a phenomenon and its asserted cause; but in philosophical knowners it now only means that process by which is mannars in the work of the contraction of a conclusion with its process by the contraction of a conclusion with the process by the contraction of the c phical language it now only means that process by which a result is shown to be a necessary consequence of the premises from which it is asserted to follow, these premises being admitted either as matter of fact, of intuitive evidence, or of previous demonstration.
In ordinary language the term is often used as synonymous with proof. Demonstration is either direct indirect: it is direct when the truth of the proposition matter: It is affect when the trius of the proposition is proved at once and directly, and indirect when it is proved by showing that the contradiction is impossible and about, which is usually termed reductio ad absender. Ref. English Cyclopadia.

#### Dandrolites

DEMONSTRATION, in Mil., the name given to a die play of troops in any particular direction, the object of which is to lead the enemy to imagine that some attack which is to lead the enemy so imagine that some attack or movement of importance is meditated in that quar-ter, and induce the officer commanding to detach a force to watch the troops so employed,—a measure which will tend to weaken his means of deteace at that point against which any attack or managuers is really directed.

or EUOHORIAL CHARACTERS, de-mot ik DEMOTIC Gr. demotikes, of the people), are terms applied by antiquaries to a certain kind of writing practised by the ancient Egyptians, and formed out of the ancient hieroglyphic, being a kind of current hand employed. by the people generally, and differing from the hieratic, or that used by the priests. It is sometimes found on public monuments along with the ordinary hieroglyphic writing, as on the famous Rosetta stone.—(See Hizzo-GLYPHICS.)

DEMULCENTS, de-mul'-sents (Lat. demulceo, I soften). is a name given to such medicines as are especially useful in obviating the action of acrid and stimulating matters, and that not so much by correcting or changing their nature as by involving them in a mild and viscid fluid, which prevents their acting, or by covering the surface exposed to their influence. They are genenerally divided into two classes, mucilages and expressed oils. In the former are almonds, collision, Arabic and several other gums, linseeds, mallows, liquorice-root, barley, cats, wheat, sago, and starch; in the latter, most Kuropean and unny foreign oils, fat, and other animal substances, including hartshorn-shavings, gelatine and isinglass, spermaceti, and wax. They are principally used in catarrh, diarrhoes, dysoutery, gravel, and a few other complaints.

DEMURRAGE, de-mur'-raj (from Fr. demeurer, to detain), in mercantile affairs, denotes the detention of a ship by a merchant, in loading or unloading, beyond the time specified in the charter-party, or other agreement with the owners. It is usually or other agreement with the owners. It is usually stipulated in charter-parties that the freighter may detain the vessel for a specified time, or as long as he pleases after the time specified for loading or unloading, on paying so much per day for overtime. During the receiving or discharging of the cargo, the merchant is liable for all detention from ordinary causes, even though these be inevitable or beyond his control; while the shipowners have the risk of all interruptions from the moment the loading or unloading is completed.

DENARIUS, de-nai-re-us (Lat. deni, ten each), was the name of the principal silver coin among the Romans, and was at first equal to ten asses, but afterwards, when the as was reduced, the denarius reprewartes, when the series are the series and the series are series are the series are the series and right under the Empire. The Romans had also a gold denarius (aureus devarius), equal to ten silver denarii; and also a copper denarius (denarius aris or areus), of which there were six in a silver denarius. The denarius has usually s belmeted figure of Rome on the one side, and chariots drawn by two or four horses on the other.

chariots drawn by two or four horses on the other.

DENDROLEGUS, den-drol'-e-que (Gr. dendron, tree; lego, I choose), a gen. of Marsupialian animals belonging to the Kangaroo fam. They, however, differ considerably from the rest by their adaptation to an arboreal life. The size of the animals belonging to this family differs considerably, some of them measuring more than four fect in length, independent of the sweeping tail; while others (see Kangaroo Rar) are no larger than a small rabbit. The tree kangaroes are found rather plentifully in New Guinea. New Guinea

DENDROLITES, den'-dro-lites (Gr. dendron, tree; lith stone), the petrified stems of trees and plants found in the secondary formations, and especially in the coal strata. These remains are found in very different sizes. strats. These remains are found in very different sizes, some being gigantic. Sometimes they are found with fossil branches, fruit, and even leaves; but in general, they are only found in fragments. The wood from which dendrolites originally were formed, mostly belongs to the Filices, the Cycades, and the Coniferency and it is generally converted into agate or pitch-stone. There is considerable doubt as to their crigin, and some of them are so hard that they are cut and used for

## Dendrosaura

artistic purposes. When cut into very thin plates, and examined purposes. When our into very tim pisses, and examined under the microscope, they show the structure of the wood perfectly, and it is possible for the boxanist not only to name the order or family, but to specify the genus and species of plants to which it belongs. Brongniart was one of the first who devoted himself to the study of this brongh of calendary. himself to the study of this branch of science.

DENDROSAURA, or TREE-LIZARDS, den-dro-saw'-ra' (Gr. dendron, tree; sauros, lizard), the term applied to a gent of reptiles of which the chameleon may be

regarded as the type. Dangue, or BREAK-BONE FEVER, deng(r), is the name of a disease that has, on several occasions, re-cently made its appearance in the southern states of North America and the East and West Judies, and is characterized as a severe inflammatory fever, accom-Danied with rheumatic pains in the joints and muscles. Though very severe, it is not often fatal, and usually terminates in a few days with a copious discharge of perspiration.

DENIZATION. den-e-zai'-shun, the act of enfran-chising or making free an alien born. (See next art.) DENIZER, den'i-zen (Welch dinassdyn, man of the city), is applied to one who is by birth an alien, but the has been made an English subject by letters atout or by certificate of the home secretary of state.

Though he enjoys more privileges than an alien, he is not on an equal footing with a natural-born subject. He cannot hold any office of trust or receive a grant of lands from the crown. He may hold lands by purchase, which an alien cannot, but he cannot take by inheritance, neither can his issue before denization inherit to him.

DENOMINATIONS, THE THERE, de-nom-e-nai'-shuns (from Lat. denomino, I name), a term applied to an association of dissenting ministers residing in and about London, organized in 1727, and which possesses the privilege of presenting addresses at court. three denominations are the Presbyterian, the Independent, and Baptist; and there are about a hundred and fifty members, of whom about one half are Independents. The origin and objects of this body are involved in some obscurity. They are very attentive to court etiquette, and present dutiful and loyal addresses to the sovereign on the occasion of births, marriages, deaths, &c. of members of the royal family. On presenting their address on the accession of a new sovereign, the whole body are introduced, and have the honour of kissing hands; on other occasions they pre-sent their addresses by deputation of about twenty, who are received in the royal closet.

DEROMINATOR, de-nom-e-nut-tor (from Lat. denomino, I name), the number of parts into which a unit is divided in any fraction. It is distinguished from the numerator, which specifies the number of parts of a certain kind which are to be taken; thus, in the frac-tion \$\frac{1}{2}\$, 3 is the numerator, and 4 is the denominator.

DENOUEMENT, da-noo'-mawn(g), (Fr. dénouer, tountie or solve), is usually employed to denote the termination or catastrophe of a play or story, but more strictly it denotes the train of circumstances that bring about the catastrophe.

DENS, deue, is the Latin term for a tooth, in the plural dentes; whence come such English words as dentist, dentition, dentifrice, &c.

DENSITY, deu'-si-te (Lat. densitas), a term which has

exactly the same practical meaning as specific gravity. If two substances are of equal bulk, but one contains more matter than the other, it is said to have more density. The quantity of matter is measured by the weight; and thus specific gravity and density become proportional. Rarity is opposed to density, and the sarest body known is hydrogen, and the densest body iridium, which is upwards of forty times the weight of water.

DENTIFEICE, den'-te-frees (Fr.), a substance, usually in the form of a powder, used as an aid in cleaning the teeth. Camphorated chalk is one of the most generally used dentifrices. Cuttle-fish shell and charcoal reduced to fine powder, are extremely useful as de-tergents. Pumice-stone is also employed when the teeth have become dark-coloured. Catechu, cinchons, and thetapy, are used in order to give astringency; myrth to give odour, and bole Armenian to impart colour to various tooth powders.

# Dechatruenta

DENTEROSTERS, den-te-ros'strees (Lat. dens. tooth; rostrum, beak), birds of predatory habits, and distinguished by the upper mandible being notched on either side. The butcher-bird belongs to this order. (See

BUTCHER-BIRD.)

DENTIST, den'-tist, is one whose business it is to treat diseases of the teeth. (See Treru and Topes.

ACHE.)

DENTITION, den-tish'-un (Lat. dentitio); is the breeding or cutting of the teeth, which takes place soon after-birth, and is frequently attended with various disorders. At birth the teeth consist only of pulpy radi-mentary substances, buried in the gum; and it is not till the third or fourth month after birth that they begin to assume shape and hardness. At this period children become uneasy and fretful; the gom is rod and swollen, accompanied with a feeling of itching, which is manifested by the eagerness with which they press any hard substance against the gums. The salivary glands sympathize with the guns, and there is a copious discharge of saliva. Frequently these symptoms of local irritation are accompanied by others of a more constitutional nature. The skin becomes dry and hot, the face flushed, the bowels relaxed, and the child very restless and fretful. A red rash usually also appears on the skin, called the red gum; and if the irritation extends to the muscles of the chest, there is a dry and troublesome cough. When the infant is in a tolerably healthy state, these symptoms usually subside in the course of two or three weeks; but if it be in a weakly condition, they frequently lead to serious and sometimes fatal results. The mucous membrane which lines the stomach and intestines may be affected from that of the mouth, and griping pains, nauses, vomiting, diarrhoes, and other disorders, may be the result. The external skin sympathizing with the internal covering may be affected with various kinds of eruptions; the air-passages and lungs may also become inflamed, or the brain and nervous system may become diseased, producing convulsions, epilepsy, tetama, &c.
The cutting of the teeth usually takes place between
the seventh and ninth month, though sometimes it is
much later. The gum again becomes extremely sensitive; but, instead of now being eased by the pres of a bard substance, it cannot endure the slightest touch. It is red and swollen, but paler at the upper part, which, just before the tooth appears, seems covered with a flat whitish blicter. The other symptoms are a repetition of those already described, with frequently eruptions about the head or lips, inflamms. tion about the ears, and occasionally spasmodic move-ments of the mouth and jaws. These diseases are not always confined to the period of infancy; for in irritable and nervous constitutions they sometimes manifest themselves (though usually in a less aggravated form) at the irruption of the second or permanent teeth, and even occasionally when the dentes sapienties are about to make their appearance. As the great exciting cause of these disorders is the local irritation in the gums, the great object to be kept in view in the treatment of them is to abate or remove this irritation. Where that is considerable, the gums ought to be freely lanced. As the flow of saliva and diarrhon are efforts of nature to carry off the inflammation, theseare not to be interfered with, unless the latter be excessive, in which case it is to be cautiously corrected by small doses of magnesia or carbonate of lime. Where the bowels are confined, small doses of cooling laxatives are to be administered. If there be drowsiness and oppressed respiration, irregular movements of the jaws, or convulsions, a leech or two to the temples, and a small blister to the back of the neck, or behind the ear, ought to be resorted to. Very mild opiates may sometimes be of benefit; but they ought only to be administered with the utmost caution, and never intrusted to the nurse. Extreme caution should also be exercised in meddling with any eruptions on the skin. Indeed, the period of dentition in children cannot be too scrupilously watched over; for there are few diseases that require more prompt treatment than some that then make their appearance; and, if not of themselves fatal, they often lead to serious or fatal disorders.

DEOBSTRUKETS, de-ob'-stru-ents (Lat. de, and ob-true, I obstruct), is a term applied to such medicines.

es have the property of pemoving obstructions in any part of the body, especially in the lymphatic system. They were formerly much used, and depended upon in medical practice; but latterly they have fallen into disuse. Almost the only deobstruents now employed are mercury, iodine, and bromine.

DEDDAMD, de'-o-dind (Lat. Deo dandam, given to God), was a term applied to a personal chattel which had occasioned the desth of a man without the default of sucother, and which was, by the law of England, forfested to the crown, in order to be applied to pious uses, or distributed as almo by the king's almoner. According to Blackstone, the custom was designed, in ording to Blackstone, the custom was designed, in the blind days of popery, as an expiation for the souls of such as were snatched away by sudden death; but it seems more probable that it is to be imputed to that natural horror which one feels at whatever has occasioned the death of a human being; or it may have been intended to teach caution to owners of cattle or implements which were attended with danger. The custom was also a part of the law of Moses; and similar regulations are to be found in the laws of most mations. Decodands were abolished in this country by \$\frac{3}{2}\$ \$\frac{1}{2}\$ \$\frac{1}{2}\$ \$\frac{1}{2}\$ to country by

DEONTOLOGY, de-on-tol'-o-je (Gr. deon, due, and logos, a discourse), properly signifies the science of duty, and expresses well what is commonly known as ethics, or moral science. It has, however, been adopted by moral science. It has, however, been adopted by Bentham and his followers to designate their own particular doctrine of ethics. "Deontology," says Bentham, "or that which is proper, has been chosen as a fitter term than any other which could be found to represent, in the field of morals, the principle of utilitarianism, or that which is useful."—Deontology; or, the Science of Morals.

DEPARTMENT, de-part'-ment (Fr. département), is a territorial division of France, which was introduced in 1790, at the instigation of Mirabeau. Previous to that time France was divided into provinces; but these were looked upon as too aristocratic by the revolutionists, and a new division was effected. The great object was to render them nearly equal to a certain average of size and population, so that the more populous departments are generally the smallest; but the rule was not uniformly adhered to. The names were chiefly taken from the rivers, mountains, or other prominent geographical features. The number of old provinces was thirty-four, and the number of departments formed was eighty-three. Afterwards, under Napoleon, the number was increased to one hundred and thirty; but till lately, the number has been eighty-six, when three new ones were formed out of the newly annexed territory of Savoy and Nice, making the number at present eighty-nine. Over each department is an officer called a prefect, appointed by the government, and a conseil de préfecture. The departments are subdivided into arrondissements, each of which is under a sub-prefect. Arrondissements are again sub-divided into cantons, and these into communes, cor-

responding in some measure to our purishes.

DEPUIGESTIGATED, de-flo-jis'-te-kai-ted, in Chern., a term used by the followers of the Stahlean theory to denute bodies which had been burnt or deprived of

their phlogiston. (See Phlogiston.)
DEFILATORY, de-pill-ö-to-re (Lat. de, from, and pilus, s hair), is a term applied to certain chemical substances employed for removing hair from the skin. Formerly employed for removing har from the same. For help it was usual to apply pitch to the part to be denuded, and shen to pull it forcibly away; but this rude practice is now discontinued. Most of the depilatories to be purchased, contain orpiment; and as this is an arsonical preparation, its employment is dangerous. One part of quicklime and two parts of carbonate of sorts, mixed and formed with water into a paste, and then applied to the part, will be found to be a good

depistory. de-ploy (Fr. deployer, to extend; Lat. de-plicars, to unfold), in Mil., when troops have been marching in column, and change the formation from column to line, they are said to deploy into line. In column, the front presented is narrow; but when the troops are in line, it is greatly extended; whence the

have a passive form, but an active or neuter significa-tion. They are so called because they have laid down,

as it were, the signification proper to their form.

DEFORMATION, de-por-tai-saus (Lat. deportatio), a kind of banishment in use among the Romans, in virtue of which a condemned person was cent to a foreign country, his estate confiscated, and himself deprived of the rights of a Roman citizen. During the French revolution, deportation was resorted to in hed of the revolution, deportation was resorved to in hea of the guillotine, and many political offenders were in this way got rid of. The punishment has lately been revived, and a number of troublesome persons have been removed to South America or Algeria. It ranks third in the order of punishments; capital punishment, and condemnation to the galleys or public works, for Hfe, below the trans below the property of the contract of the con being the two highest

DEPOSIT, de-poz'-it (Lut. depositum, from depono, I lay down), usually signifies a sum of money which one man puts into the hands of another as security for the fulfilment of an agreement, or as a part payment in advance. Among the Romans, a depositum was anything which one person put into the hands of another to be kept without any remuneration, and to be restored whenever demanded. The depositury was not bound to take more than ordinary care of the article, but he had to make good any loss occasioned by fraudu-lent design or gross neglect. To refuse to return a deposit involved infamy. The principles of the Roman law on this subject have been adopted by most modern nations.

DEPOSITION, dep-o-rish'-un (Lat. depositio), the testimony of a witness put down in writing by way of answer to interrogatories exhibited for that purpose in chancery, &c. Informations upon outh, and the evidence of witnesses before magistrates and coroners, are reduced into writing in the words used by the witnesses, or as nearly thereto as possible. Evidence in the court of Chancery is taken in written answers

to interrogatories, which are also in writing.

DEPOSITION, in the Church of Scotland, is the de-priving a clergyman of his ecclesiastical dignity and of the temporalities of his benefice, in consequence of immoral or seandalous conduct, or of holding doctrines contrary to the standards of the Church. Usually, proceedings are commenced in the presbytery within whose bounds the clergyman officiates; but an appeal lies against its judgment to the General Assembly. He may afterwards be restored by the General Assembly to his position as a minister, but he cannot be restored to his benealee.

DEFESTORED to INS DESIGNATE.

DEPOSITES, de-pos'-ifs, in Geol., those rocks which have been formed by the settling down of matter held in suspension in water. Deposits originate in denudation, the forming of alluvium, and the gradual collection of send, gravel, &c., at the mouths of rivers. (See DELTA.) Deposits are called marine, lacustrine, fluviatile, &c., according to the circumstances which attended their formation.

DRYOT, de-po' (Fr. dépôt), in Mil., the name given to any place in which naval and military stores are deposited, but it is more particularly applied to the town or barracks which form the head-quarters or home station of any regiment the main portion of which is serving abroad. Here the records and books of the regiment are kept, and one or two reserve com-panies are stationed, which are called depot companies. All recruits and young officers appointed to the regi-ment are sent to the depôt to be drilled, and to learn their duty before being sent out as reinforcements to the regiment wherever it may be stationed abroad. The depot system was introduced into the British service in 1825.

I) ETRIVATION, dept-ri-rait-shun (from Lat. de, and price, I take from, in Eccl. Law, is the removing a person from some degree, dignity, or order in the Church, and the depriving him of his ecclesissical preferments. The modes of deprivation are usually reduced to three heads:—1. Where the thing done is in itself actually null, void, and inoperative in iaw,—as the presentation of a layman to a benefice, and then there is no need of any sentence of deprivation. 2. Where the statute declares that upon the doing, or meaning of the term.

Deposites, de-po-nent (Lat. depone, I lay down), fineto deprived, there is no need of any sentence. 3.

It a term applied in Lat. Gram, to certain verbs which Where the doing, or the omission to do, certain acts

# Deputation

are causes only for deprivation by the ecclesiastic court, then there must be sentence of deprivation. I all causes of deprivation, where a person is in actual possession of a benefice, these things must occur: possession of a peneace, mess things must occur:—
2. The party must be cited and admonished to appear;
3. a charge must be given against him by way of libel or acticles; 3. a competent time must be assigned for his proofs and interrogatories; 4. the person accused shall have the liberty of coursel to defand his account. shall have the liberty of counsel to defend his cause to except against witnesses, and to bring legal proof against them; and 5. there must be a solemn sentence read by the bishop, after hearing the merits of the cause and the pleadings on both sides. Incontinence, drunkenness after admonition, and gross scandal, are deemed sufficient grounds for deprivation, when proved to the satisfaction of the court; also disobedience to the orders and constitutions of the Church; conviction of treason, murder, or other felony, by a temporal court; or of perjury, either in a temporal or ecclesiastical court.

DEFUTATION, dep-u-tai'-shun (Lat. deputatio), is a number of persons selected in order to represent the views of a larger body or company on any particular question, to lay their case before some person of in-fluence or in office, or to act for them in any particular affair.

DEPUTIES, CHAMBER OF, dep'-u-tees, was, under the French movarchy, the lower of the two legislative chambers in that country. It consisted of 430 members, representing the 86 departments, and holding office for three years. Each member was required to be at least 30 years of age, and to pay annually, of direct taxation, The right of election was vested in persons 25 years of age, and paying 200 francs of direct taxation; lists of such persons being made out annually by the mayors of the several communes, and revised by the mayors of the several communes, and revised by the prefect. The Chamber of Deputies was composed of three great divisions,—the côlé droit, côlé gauche, and the centres. The côlé droit, or right side, was to the right of the president's chair, and consisted of such members as were inclined to support the royal pre-rogative. The côté gauche, or left side, was occupied by those that usually supported popular measures; while those persons who generally supported the ministers occupied the centres (centre droit and centre gauche). The constitutional monarchy and representative government of France being overthrown by the revolution of 1848, a national assembly was instituted, the members of which were elected by ballot and a suffrage all but universal. The National Assembly was abolished in 1851, and the year following a new form of government was established. Corresponding to the Chamber of Deputies under the old régime, is now the Corps Ligislatif, or legislative body, composed of 261 members, in the proportion of one deputy to about every 35,000 electors in each of the departments. They every 35,000 electors in each of the departments. They are chosen for six years by universal suffrage, and each member receives an indemnity of 2,500 francs a month during the session. The emperor selects the president and vice-presidents from among the members, and has also the right of convoking, adjourning, or dissolving the body. The chamber has no power of originating any law, but merely of discussing and voting on such measures as are brought before it. If amendments are adouted, they must be sent to the Young on such measures as are orought before it. In amendments are adopted, they must be sent to the council of state, and no measure can be discussed that has not received the sanction of that body. The session lasts for three months, and, in case of a dissolution, a new one must be convoked within six months.

DEFOTY, dep'-u-te, is one who is appointed in the place of another, and who exercises the power that properly belongs to him. The appointment of a de-

properly belongs to him. The appointment of a deputy does not free the principal from responsibility.

DEER DAY, THS, day-be, the second day of the Epsom summer meeting, when the great race of the Derby stakes is run for. It is generally in the last week of May or the first week in June, and is always held on a Wednesday. The first Derby race was instituted by Lord Derby in 1780, and the stakes consist of fifty sovereigns each, with twenty-five torfeit. At the first Derby there were only 36 subscribers; but the race has ever since grown rapidly in fame and popularity; in this year (1862) the number of subscribers was 233; the number of horses starting 34, and the net was 233, the number of horses starting 34, and the net value of the stakes £6,525. The Derby day is the great 637

# Derrick

holiday for nearly all the inhabitants of London; the roads between the metropolis and Epsom are througed from an early hour with every variety of vehicle, and the railway frains are constantly leaving the stations, with fresh cargoes of passengers for the Downs. It is almost impossible to get a horse on the Perby daylin or about London. The horses that run in the Dechy must be three years old, and the course is a mile and half in length. An immense amount of money, heades that fin length. An immense amount of money, leaded the stakes, is won and lost annually on the result. The Derby of 1871 was won by Favonius, and was run in two minutes fifty seconds.

DEBENDED STAR, der be-sheer.—In Min., figor. spar is popularly known by this name, from the most celebrated fluor spar being found at the Blus John mine, in Derbyshire.

DEBELICT, der'-e-likt (Lat. de, and relinquo, I leave or forsake), in Law, is a term applied to such goods as are thrown away or relinquished by the owner. "Property both in land and movables being originally acquired by the first taker,—which amounts to a declaration that he intends to appropriate the thing to his own use,—it remains in him, by the principles of universal law, till such time as he does some other act which shows an intention to abandon it; for then it becomes, naturally speaking, public juris once more, and is liable to be again appropriated by the maxt occupant." In the case of lands gained from the sea, the law holds, that if this gain be by small and imperceptible degrees, it shall go to the owner of the land immediately behind; but if it be sudden and con-siderable, it belongs, by common law, to the crown; for the soil, when the sea flowed over it, was prima facie crown property, and therefore ought to remain so, though no longer covered by the sea. In the same way, in the case of an island rising in the sea, it is held to be the property of the crown, though the civil law gives it to the first occupant.—Ref. Stephen's Commentaries on the Laws of England.

DERIVATION, der-iv-ai'-shun (Lat. derivatio, from derivo, I drain off), in Med., is applied to the removing or drawing away of a disease from its original seat to another part by artificial means; as by the application of a blister in pleuritis. The doctrines held by the earlier physicians on this subject, as that the matter of the disease was thus drained away through some channel, are now quite exploded.

DERMATOLOGY, der-ma-tol'-o-je (Gr. derma, the skin, and logos, a discourse), is the science of the treatment of the skin and its diseases.

DERMESTIDE, der-mes'-ti-de (Gr. derma, skin; esthio, I cat), small beetles of a very destructive character. Nothing seems too tough for their digestion. Although obnoxious in many respects, the insects of this family are of infinite service in the economy of nature, by causing the rapid decomposition of animal matter into a substance fitted for the improvement of the soil, and by their labours, united with those of the Silpha, Necrophori, &c., destroying such portions of these remains as are left untouched by the flesh-flies, which only consume the soft portions of the carcuses."—
(Westwood.) The best known of the dermestes is D. cardurius, or bacon-beetle, a name applied through the insect's real or supposed fondness for bacon. It is the insect a real or supposed indimess for bacon. It is about a third of an inch in length, and of a dusky brown colour, with the upper half of the wing-shells ash-coloured, and marked with black spots.

DREMICK, derf-rik, a temporary crane, consisting

of a spar supported by stays and guys, carrying a pur chase for loading or unloading goods on shipboard. The derrick is an invention of Mr. Bishop, an American. Derricks have been used for a considerable time in America as lifting powers: they have been proved very expeditive and economical. One of the largest ever made was constructed by the Thames Iron Shipbuilding Company. It is a floating derrick, and consists of a flat-bottomed vessel 270 feet long and 90 feet across the beam. It is propelled by bucket pad-dle floats, and can be moved at the rate of four niles an hour. From the deck rises an iron triped 80 feet an hour. From the deck rises an iron triped 80 feet high, on the top of which a boom 120 feet long revolves. Above the boom is the king-post, a continuation of the tripod, 50 feet high. Ten fourfold blocks are attached to one arm of the boom, and the chains attached to

e are passed across the ki and of the boom, and down in the vessel, where they are connected with two powerful steam-engines. A body weighing 1,000 tens can dot only be lifted by this powerful crane, but can be transported from place to

Drawiss, der visk (Persian, a poor person), is em-ployed like the corresponding Arabic word Jakir, to denote a perticular class of persons in Moslem coun-tries, resembling in many respects the monks of Christendom. There are many different brotherhoods and orders of dervishes, who are generally named after iders of derrispes, who are governing to tradition, their originates from the earliest times of Islam, but they proble areas at a much later period. They mostly live bably arose at a much later period. They mostly live in richly-endowed convents called Tekkije or Changah, and are under a chief, who has the title of sheik or pir. i. c. elder. They are generally allowed to marry, pir, i. s. elder. They are generally another the but are obliged to sleep one or two nights a week in the convent of their order. Among some of the orders a part of their religious exercises consists in dancing and terring round with great velocity, while others and terring round with great velocity, while others and the seem generally to lead very worthless lives and to practise the grossest immoralities, yet they are regarded with great awe and veneration by

DESCANT, des-kant' (Sp. discante), a term formerly used to express the art of composing in parts. By Hubald, Odo, Guido, and others, it was employed to stenify concord and harmony of sounds. Descant is of three kinds; viz., Plain descant, which is synonymous with simple counterpoint; Figurative descant, which is less restrained, and includes the relief of discords; and Double descant, which denotes that arrangecords; and Double descant, which denotes that arrangement of the parts which will allow the treble or any high part to be converted into the bass, and rice verid. This term is also employed to imply a melodious display of notes extemporaneously played or sung to any given bass, as well as to denote the highest part in the score, viz., the soprano, or highest female voice.

DESCENT, de-sent' (Lat. descensus; Fr. discent, in which way the term is usually spelt in all old law-books), the title whereby a man, on the death of his ancestor, obtains the inhoritone as being-tallaw. The term in.

obtains the inheritance as heir-at-law. The term in heritance is sometimes used in the same sense, although it properly signifies that which is, or may be, inherited by descent. Descent is defined in the interpretation clause of the 3 & 4 Will. IV. c. 106, as "the title to in-herit lands by reason of consanguinity, as well when this heir shall be an ancestor or collateral relation, as where he shall be a child or other issue." Inheritances, hereditaments, things which may be taken by descent are various. The crown is the principal of these, the descent of which differs in one essential point from that of a private inheritance. When a king has no sons, the eldest daughter takes the whole of the inheritance, in exclusion of the younger sisters. Dignities and honours, such as baronies and other peerages, are descendible according to the limitations contained in the patents by which they were created. (See Hair, IMPRITANCE.)—Ref. English Cyclopædia, sect. Arts and Sciences, art. Descent.

and Sciences, art. Descent.

Description, des-krip-shun (Lat. descriptio, from de, and scribe, I write), in Literary Composition, is the placing of objects in a clear and proper light before the reader; a matter of so great difficulty, and requiring such high and varied powers, that many critics regard it as a test of genius. When we consider the great qualifiions that are necessary to excellence here, it is not to be wondered at that we find so few writers distinruished for great descriptive powers. "The best sessiners, says that, "are simple and concise. They set before usenoh features of an object as on the first view atrike and warm the fancy; they give us ideas which a statuary or a painter could lay hold of and work after them, which is one of the strongest and most declays tests of real merit of description." nous accuracy tests of real merit of description."
Objects ought to be painted so accurately as to form in
the mind distinct and lively images. Usaless circum-stances ought to be suppressed, because they load the examples ought to be apprecised, occase they lost the married or in numerous flocks, and a few monkeys and antelopes ever slight, it cannot be described too minutely. Inferior writers are continually striving to enliven their subject by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and a profuse use of supercular to the married by exaggeration and the m

latives, which unfortunately has the contrary effect to what is intended, and the reader is led by contrast to think more meanly of the subject than probably it deserves. A pradent man, in writing as in walking, husbands his strength, and reserves his strongest expressions for the most important points of his narrative. Reasons that are known to every one ought to be taken for granted; the expression of them is childish, and interrupts the progress—a uncertaint of world is interrupts the progress,—a superfinity of words is always a great nuisance in narration. Abstract or general terms are always to be avoided. Sometimes a single circumstance, happily introduced, has more power than the most laboured description. The words power than the most isbource description. The worths selected should correspond with the siless they are intended to convey,—an elevated subject requiring so elevated style, a familiar subject a plain style, and a serious subject as plain style, and a serious subject a verious style. A writer of genius is not apt to clothe a high subject in low words; but it is more common to find the expression raised above the more common to mid the expression raised above the tone of the subject. Description addressed to the imagination is susceptible of the highest ornaments that sounding words and figurative expression can bestow upon it. Writers of genius, sensitise that the eye is the best avenue to the heart, represent everything as passing in our sight, and from readers or hearers, transform us into spectators. "The force of language," says Lord Kames, "consists in raising complete images, which transport the reader as he language, says Lord names, consists in rasing complete images, which transport the reader, as by magic, into the place of the important action, and convert him into a spectator, beholding everything that passes. The marrative in an epic poem ought to rival a picture in the liveliness and accuracy of its representations: no circumstance must be omitted that tends to make a complete picture, because an imperfect image, as well as any other imperfect conception, is cold and uninteresting." There is no species of composition into which description does not enter in some chart, there are few compositions of any length that can be called purely descriptive. In descriptive poetry the highest exertions of genius may be displayed. "De-acription," says Blair, "is the great test of a poet's imagination;" and in the "selection of circumstances lies the great art of picturesque description." They ought not to be vulgar and common, such as are apt to be passed by without remark, but such as may eatch be passed by without remark, but such as may eaten the fancy and draw the attention. All the circum-stances employed ought to be uniform and of a piece, and ought to be such as particularize the object de-scribed and mark it strongly. "This happy talent," says Blair, "is chiefly owing to a strong imagination, which first receives a lively impression of the object, and then, by employing a proper selection of circumstances in describing it, transmits that impression in its full force to the imagination of others.

DESERT, dez'-ert (Lat. desertus, deserted, solitary), weste or large tract of barren country. The term is a weste or large tract of barren country. a weste of large tract of barren county. The term is applied very vaguely, but is more particularly appropriated to sandy and stony plains. According to Dr. Ami Boné, in a memoir communicated to the Association of German Naturalists at Gratz, in 1843, deserts, properly so called, always point out the site of a large gulf or inland sea. These large sheets of water bave now entirely disappeared, but they are of a compara-tively recent geological epoch. Deserts are distinnow entirely disappeared, but they are of a comparatively recent geological epoch. Deserts are distinguished by different names in various parts of the earth. The term desert is more particularly applied to the waste tracts of Africa and Arabia. Those in Asia, especially in Thibet and Tartary, are called steppes. In South America, the large plains, rank with vegetation but unfit for human settlements, are called llanos, pampas, and silvas, or desert-forests. The wide-stretching plains of North America are called prairies and savannahs. The desert of Sahara is the most famous of the properly accessed the stretches almost without properly so-called deserts. It stretches almost without a break from Cape Nun, on the north-west coast of Africa, castward to the banks of the Nile. In some parts of this desert, as at Tegazza, rock-salt as white as snow extends in vast beds beneath a stratum of rock. Rain only falls between July and October, and the vast plains are tenanted by lions, panthers, and serpents, often of a moustrous size. The ostrich is also found often of a monstrous size. The catrich is also found in numerous flocks, and a few monkeys and subleopes pick up a scanty silowance of food. Here and there, often at great distances, are a few small fertile spots,

chants, who travel on camels, hence called "the alips of the desert.

DESERTER, deserter (Let. deserces, to shandon), in Mar. and Mil., the name applied to any soldier or sailor who abscends from his ship or regiment for the purpose of avoiding the duties which he has consented to discharge for a certain period. Desertion is punished by imprisonment and diogning; but the number of lashes allowed to be awarded by court-martial is not to exceed fifty. It involves the loss of additional pay and penion, good-conduct movey and stripes, and rank as non-commissioned officer. If a soldier or sailor is merely absent without leave for a short period, the wreach of discipline committed sloes not amount to DESERTER, de-sert-ter (Lat. deservere, to abandon) merely absent without leave for a short period, the mered's of discipline committed sloes not amount to describe, and is punished by loss of pay for the time ne is absent, and confinement to barracks or extra drill. Any one who induces a soldier or sailor to desert is liable to penal servitude for life. The crime of desertion was formerly punished by death; and it is only since 1860 that the custom has been abandoned of branding the deserter on the breast or shoulder with the letter D.

DESERTION, de-zer'-hun, in Marriage.-Till recently the law of England made no provision for a wife's obtaining redress for wilful desertion by her husband; but by 20 & 21 Vict. c. 85, and 21 & 22 Vict. c. 108, desertion by either spouse is made a ground of judicial separation, and provision is made for the protection of property ecquired by a wife who has been deserted. In Scotland, one of the spouses wilfully deserting the other may first be sued for adherence, after one year; and, after four years from the time of desertion, may be divorced by the Court of Session.

DESICCATION, des-ik-kai'-shun (Lat. de, and sicco, I dry), in Chem.—Bodies are generally dried in-two ways, — by submitting them to heat, more or less gentle, or by inclosing them in a receiver, with concentrated oil of vitrol or chloride of calcium. The latter process is resorted to when heat would cause

the decomposition of the body acted upon.

DESIDERATUM, de-zid-e-rail-tam (Lat., wished for), denotes something that is wanted to the completness of a thing, or to promote the advancement of any

DESIGN, de-zine' (Lat. designo, I mark out), denotes. in a general sense, an intention, scheme, or plan of action, and in the Arts is applied to the idea or plan in the mind of the artist which he attempts to embody or represent in some visible form to the minds of or represent in some visible of the second of thers. Every work of design may be considered either in relation to the art that produced it or to the and that it is intended to serve. What is done with a end that it is intended to serve. What is done with a view to some effect that is to follow, is said to be the result of design; and from the adaptation of means to ends that we observe in nature, we are led to conclude that they are the work of an intelligent designer. For the arguments that are employed to prove the being of a God from the evidences of design that are to be seen in nature, see Paley's Natural Theology; the Bridgewater Treatises; and the Burnett Prize Essays.

DESIGN, in Arch., the name given to a set of geometrical drawings drawn to a certain scale, representing the different sides, interior, and extent, of any building, in such a manner that it can be erected by a builder in exact conformity with the original des or conception of the architect. When the building is small, these are taken as working drawings, but if it be of great size and extent, working drawings are made from them for the use of the builder on a larger scale. They are intended to show the proportions and outline of the required building, and in them the principles of perspective, and light and shade, are disregarded enperspective, and light and shade, are disregarized entirely as regards the former, and almost entirely with respect to the latter. The various parts of an architectural design for any building are respectively termed "plan," elevation," section," and "details." The plan shows the shape of the building and the area which it is to cover; it may be termed with propriety a horizontal section of the building; it shows the position of the walls of the rooms, and their rethe position of the wais of the rooms, and their re-spective thickness; the situation of rooms and pas-sages with regard to each other, and indicates the apertures required for doors, windows, fire-places, staircases, &c. The parts representing solid masonry-are coloured, while the open spaces are left plain, and 639.

indicated by dotted lines. A plan is given for a floor of a building, from the basement opwards the exterior of the roof is also represented in this the exterior of the roof is also represented in this man-ner. The elevations show the outline of the front, back, and sides of the building, and the windows, doors, projections of chimneys, and all the ornement-stion that may be introduced; such as string-courses, dressings of the doors and windows, cornices, anta-bletures, balconies, &c. The sections are represent-ations of the interior on a vertical plane, supposed to pass through the building from top to bottom, on any line indicated on the ground plan. They show the lickness of the floors, the height of rooms, the height and form of doors and fireplaces, the profiles of op-nicos, domes, and skylights, as well as that of the roof; the direction of staircases, &c. Details, or parts at large, are representations of the horizontal and ver-tical sections of different rooms and parts of the tical sections of different rooms and parts of the building on a larger scale than that which is used for the general plan: they are also drawings of any em-bellishment that may be introduced, and are neces-sary to make their intended form intelligible to the workmen

DESIGN, is an expression employed in the Fine Distor, is an expression employed in the Fine-Arts to signify the representation of any form of combination of objects, either in simple outline or in colour. It is applied indiscriminately to saything of this kind, from the sketch of any simple object or elementary form, that may be represented by a few strokes of the pencil, to the elaborate combinations required for the intricate pattern of a shawl or say other similar production of the loom, as well as to the composition of a picture, or group of figures, or the form of any work of art, whether useful or grammental. The most exquisite designs, with reference to attitude, elegance of form, and force of expression, are considered to exist in the works of the old Greak collators and the best Italian masters of the mediaval period such as the marbie: of the Parthenon, the cartoons of Raffaelle, and the statues of Michael Angelo; but there are modern painters who are in no way inferior to the old masters in design and power of conception; in proof of which may be mentioned Mr. Frith's wonderful painting known as "The Railway Station."

DESIGN, SCHOOLS OF.—The government echools of

design that are established in various parts of the scountry, in connection with the Central Training School at South Kenaington, which was originally opened at Somerset House in 1837, are intended to impart a knowledge of drawing and a taste for the fine arts to the great bulk of the people, and more par-ticularly to those who are employed as artisans and designers in manufacturing establishments of all kinds. It was the intention of the originators of the scheme to confine their operations entirely to the latter class; but it was soon discovered that the public generally would not appreciate beauty and symmetry of form and proportion, and harmony of colour, in objects of every-day use, before means had been taken to teach the people the general and rudimentary principles of the people the general and radimentary principles of art, and inspire them with a desire for that which is pleasing to the eye, whether in household furniture, paper-hangings, earthenware, or materials for the attire of the person, in preference to the ugly, un-shapely, and staring art-productions of the 18th and early part of the 19th century. It was also found, that however Englishmen might excel in the manufacture of everything in which strength and utility are required, they were far behind the French and other continental unitions in ornamental and decorative art, and did not apparently understand that stability and usefulness could be combined with elegance of form and pleasing colouring; and it was a knowledge of this, and an earnest desire to remedy this palpable deficiency in English art, that led the late Prince Consort to conceive and mature the idea of the Great Exhibition of 1851, to which the establishment of the schools of design may be considered, in some degree, to have been a stepping-stone. At all evants, the productions of British workmen in the International Exhibition of 1862 have shown that the leasons learns in these achools and the Exhibition of 1854 have and continental nations in ornamental and decorative art in these schools and the Exhibition of 1851 have not been lost; and the interiors of our dwellings show that our artisans are giving forms and ornament to the articles they produce, suitable to the purposes for

which they are intended wand that people are begin ning to see that it is more consonant with reason t and a secret figured with a geometrical pattern rather than gaudy bundles of flowers; and that the eye in better statisfied to rest on a jug of simple design and solour, whose outline is formed of graceful curves, tolon, whose outline is formed of graceful curves, than on one of that squat bulging form in blue and white, or two shades of brown, ornamented with uncouth figures in bas-relief, or the unmeaning willow pattern, which was the stereotyped fashion, both as regards shape and decoration, for jugs of all kinds some thirty or forty years since. The schools of design the under the control of the Science and Art Describes the Committee of Committee o partment of the Committee of Council on Education, and the offices of the department, and the Central Training School for the United Kingdom, are in Creawell Road, South Kensington. To this school both male and female students, that are duly qualified, are admitted, and partly maintained at the expense of the government while passing through the prescribed course of study. When they are fully competent, they receive certificates, and are sent as teachers to local schools in connection with the central establishment. Teachers in these local schools receive grants from government, in addition to their income, in proportion to the success of their pupils at the annual inspection and examination, when medals and prizes are awarded to the most deserving and efficient. A school of art may be founded in any locality in connection with the central school, provided that suitable premises can be obtained, at the public expense, the government, in some cases, bearing as much as one-fourth of the total cost when new buildings are erected for the purpose. It is also requisite that there be fire public schools for the poor, in which the master recommended by the department can give instruction, or 500 poor children in the district, who must be taught, if it be desired, free of expense. Pupil teachers in National and British schools are also entitled to receive instruction at a low charge; and an evening class must be held three times a week, at which any person can receive instruction in drawing for a sum not to exceed sixpence weekly. Successful students at the local schools send their drawings for competition to the central school, when queen's prizes and medals are the central school, when queen's prizes and medals are awarded to those who excel in any particular branch of art. Each school obtains drawings, works of art, or apparatus, to the amount of \$10, for every queen's prize or medal obtained by the pupils who have studied there. Every school of art may borrow books, drawings, and works of art from the museum and library at South Kensington; and any mechanics' or working man's institute can obtain assistance in the purchase of drawing models and casts for the purposes of instruction.

DESIRE, de-zire', is an affection of the mind excited by the view or the contemplation of any desirable good which is not in our possession, but which we are acti-citous to obtain. There is room for difference of opinion as to the number of our desires that are origuisd; but that certain of them are primarily inherent in our nature, scarcely admits of doubt. (See Ethics.) DESMODIUM, des-mo'-de-um (Gr. desmos, a bond, in al-

lusion to the stamens being joined), in Bot., a gen. of plants belonging to the nat. ord. Leguminosa. Some of this tropical species are remarkable for the periodical movements of their leaflets. In D. gyram, a native of India, the leaf is trifoliate, the terminal leaflet being much larger than the two lateral ones. When exposed to the influence of a bright light, the large leaflet besomes more or less horizontal; but, on the approach of evening, it falls downwards. The lateral leaflets are in constant motion during the heat of the day, are in constant motion during the heat of the day, indicateing by their edges towards the large terminal leader, and then retreating towards the base of the common petiole. This movement takes place first on one side and then on the other, so that the point of each leader describes a circle. As these movements resemble those of the arms of the old semaphore telegraphs, the plant has been named the telegraph-plant. We satisfactory explanation of the cause of the extraordinary movements of the leadets has yet been

ower is vested in the hands of one who is irresponsi ble or uncontrolled by others. The term is received from the Greeks, among whom it denoted that kind of relationship that subsists between a master and his claves. As a master had unlimited and uncontrolled power over his slaves, governing more by hardiness than concllistory measures, and viewing them only as intended to serve his own ends; so a despotic form of government was regarded as one where the sovereign government was regarded as one where the sovereign had unlimited power over the lives and fortunes of his subjects. But this idea of a despotism is one which could never have any existence in fact." No sovereign has ever been so absolute or despotic as that he gould carry out his wishes with a total disregard to every one elise. His power actually depends upon his having the support of a large body of his subjects; and its, is compelled to act so as to carry along with him their approval, or, at any rate, not to go in opposition to their wishes. The most absolute monarch that ever lived could not openly seize the property of a subject, or put him to death, without assigning some colourable grounds for so doing; for such an set would undoubt-edly endanger his crown. The existence of an absolute government, when carrying out oppressive measures, depends upon its being able to couceal or pervert the real facts of the case. Despotic rulers feel their dependence upon public opinion much more than those whose power is in some measure limited; and it is this that leads them to lay restrictions upon freedom of speech and of the press. According to some, a despotism may include any number of individuals governing for their own individual interests, to the exclusion of those of the whole community.

DESTINY, des'-time (Lat. destino, I fix or appoint), is an appointed or predetermined state or condition; the necessary and unalterable course of events predetermined by a superior Being. A belief in destiny or fats has been held by almost every people in every time, and has been usually incorporated in their religious beliefs. Among the ancients it was regarded as a power superior both to gods and men, governing all things irresistibly; for, according to Seneca, the Ruler of all things, in writing the book of destiny, prescribed the limits of his own power. According to the Stoics, destiny is a certain arrangement of events which follow ach other of absolute necessity, there being no power able to interrupt their connection; and hence every man ought with patience to submit to his fate, which no effort on his part could possibly avert. (See Fars.) The doctrine is also held by many persons in the Christian church. (See PREDENTINATION, FREE WILL.)

DESTRUCTIONISTS, des-truk shun-ists (from Lat. de-strue, I destroy), in Theol., is a name given to such as hold a kind of middle scheme between universal renoid a kind of middle scheme between universal restoration and cuidless perdition, or who maintain that the wicked shall neither be for ever miserable nor finally saved; but that, after undergoing an awful suffering proportioned to their crimes, they shall be utterly annihilated. This doctrine, they maintain, is implied in the scriptural word death, which they hold denotes a termination of miffering and the translation of miffering and the standard contract. implied in the scriptural word death, which they hold denotes a termination of suffering; and that eternal death is simply annihilation. Though there is apparently so little reason for this view, yet it has been entertained by some able theologians.

DESVAUXIACEE, dui-voze-e-ui'-se-e, in Bot., the Bris-DETACHMENT, and to ord. of monecotyledonous plants, in the sub-class Petaloidew. They are small, aedge-like herbs, with actaceous sheathing leaves. They are natives of Australia and the South-Sea Islands.

Detachment, de-ditch-ment (Fr. detacher, to unfasten), in Mil, the term applied to any body of troops, whether large are made of the same of the sam

resten), in mil., the term applied to any body of troops, whether large or small, sent from an army, division, brigade, regiment, or company, for the performance of some special service. Large detachments, consisting of cavalry, infantry, and artillery, almost forming a separate army, may be sent from the main body to create a diversion, and attract attention to some particular nearly that are the second particular ticular point; to carry on the siege of any fortress; to protect lines and bases of operation, or to act on those of the enemy; to prevent the junction of two separate detachments of the enemy; to capture or protect a convoy; or toget on the flanks or rear of an enemy on the field of battle.

DESPOTISM, des pot ism (Gr. despotes, master), in DESTRIGENTS, de ter jents (Lat. detergo, 1 wip. Pol., is a form of government in which the supreme away), is a name given to such medicines as cleans DETERGERTS, de-ter-jents (Lat. detergo, I wips

#### Determination

Development Theory

and remove viscid humours adhering to and obstruct ing the vessels; also such applications as cleanse foul

DETERMINATION, de-ter-min-at-shun (Lat.), in Med. is applied to the excessive flowing of the blood to any part; as a determination of blood to the head, &c.

DETINUE, det'-in-ue (Lat. detinendo), in Law, is the name of a writ which lies against one who, having goods

delivered to keep, refuses to restore them.

DETONATING POWDER, det'-o-nai-ting pow'-der (Lat. DEFORATING FOWDER, aer-o-mar-ting powr-der (Lat-detono, I thunder; Fr. poudre, p. powder), a term applied to certain combinations of substances which detonate or fulminate by slight friction, by heat, or by electricity. Amongst these may be mentioned the ammoniurets of gold and silver and the fulminates of silver and measure. and mercury. In most cases of detonating powders, decomposition is the result of detonation; thus, ammoniuret of gold is separated into metallic gold and other products. Iodide of nitrogen, a detonating powother produces. Induce of introgen, a deconsing pow-der, resolves itself into iodine, which appears as a violet vapour, and nitrogen, which assumes a gaseous form. A mixture of 3 parts of nitre, 2 of dry carbonate of potash, and 1 of sulphur, forms a detonating pow-der. If a small quantity of this compound be heated on a metallic plate to about 330°, it blackens, fuses, and explodes with much violence, in consequence of the rapid action of the sulphur upon the nitre, and the sudden evolution of nitrogen and carbonic acid. Detonating powders are much used in the manufacture of percussion-caps.

DEUS EX MACHINA, de'-us eks mai'-kin-ā (Lat., a god from the machine), is an expression borrowed from the ancient stage, it being usual among the ancient Greeks, when there was any difficulty in bringing the plot to a satisfactory conclusion, to have recourse to the assistance of a deity, who was let down in a machine for that purpose. In the modern drama, when a person or incident is arbitrarily introduced in order to bring about the dénouement, this is called a deus ex machina.

The rich old uncle who comes home unexpectedly from the West Indies, and rescues his scapegrace nephew from his pecuniary embarrassments, is a deity of this stamp. The expression is also by analogy sometimes madical text to rade in which come publishes these stamps. of this stamp. The expression is also by analogy some-times applied to the mode in which some philosophers attempt to account for facts which they cannot explain by any known law; viz., by the intervention of supernatural agency.

DEUTRIS agency.

DEUTRISO-CANONICAL, du'-te-ro (i.e., belonging to the second canon), a term applied by Roman Catholic writers to what is commonly termed by Protestants the Apocrypha, or the Apocryphal books of the Old Testament. They receive their name from their being regarded as inspired, but not of the same authority as

regarded as inspired, but not of the same authority as the canonical books proper.

DETTERONOMY, du-ter-on'-o-me (Gr. deuteros, second, and nomos, law), is the fifth book of the Old Testament and the last of what is termed the Pentateuch. This book was written by Moses shortly before his death, and embraces a period of five or six weeks of the fortieth year of the journeyings of the children of Israel in the wilderness. He speaks with the affection and solicitude of an old man soon to die, and with a freedom, boldness, and vehemence which none could freedom, boldness, and vehemence which none could have used but one who had done so much for the people whom he addressed, and one who was anxiously desirous for its future welfare. The tone of the law fulls here considerably in the background, and the individuality of the lawgiver and his peculiar relation to the people stand out more prominently. He is taken up with their inward concerns and future fate, laying before them the good effects that will follow the ob servance of the law, and the evil consequences that will infallibly result from its neglect. Most of those to whom it was more immediately addressed had not seen many of the wonders of God, or had been too young to understand them; and hence the sacred historian begins by recapitulating the various mercies which God had bestowed upon them and their forestands from their dear turn out form.

ing promises made to them by God, which he would assuredly perform if they did not frustrate his designs of mercy by their own wilful obstinacy. That no person might thereafter plead ignorance of the divine law, he commanded that it should be read to all the people at the end of every seventh year; and con-cluded his ministerial labours among them by a most beautiful ode, and by giving his benediction to the several tribes. In the last chapter, which is commonly several trioes. In the last enabler, which is commonly ascribed to Joshus, we have an account of the last days of Moses; how, from the top of Mount Nebo, he surveyed the promised land; and then, having died in Mosh, was buried by God himself, so that no one in Mosh, was buried by God himself, so that no one knew his tomb. This book contains only one prophecy relative to the Messish, but a number of very remarkable predictions relative to the future of the Jews.—

Ref. Horne's Introduction to the Holy Scriptures.

DEUTEROPATHIC, du'-te-ro-puth'-ik (Gr. deuteros, second, and pathos, suffering), is applied, in Med to an affection induced in a part through sympathy with the part originally affected; as, where the stomach is disturbed through a wound in the head.

DEUTOSIDE, du'-toks-ide (Gr. deuteros, second, and coxide), in Chem., the oxide of a metal containing a double dose of oxygen. The word binaxide is, however, more generally used. This remark applies to all compounds commencing with the word deuto.

compounds commencing with the word deuto.

DRUTZIA, de-ut'-ze-a, in Bot., a gen. of plants belonging to the nat. ord. Philadelphace. The leaves of some species, especially those of D. scabra, are covered with beautiful scales; hence, from their roughness, they are used in Japan for polishing purposes.

DEVELOPMENT (See PHYSIOLOGY.)

DEVELOPMENT THEORY, de-vel'-op-ment the'-o-re (Er. développer, to develop; théorie, theory), a theory originally propounded by the author of a work entitled "Vestiges of the Natural History of Creation," published in the year 1844. In this work the author first states that animal and vegetable life have progressed gradually on the globe. With regard to animal life, and arguing from fossil remains, he places the order or progression as follows:—First, an era of invertebrate animals; second, a period during which fishes were the only vertebrate form of being; then a period when reptiles were seen in addition, but without birds or mammalis; next a time when the last were added, but without way, and facility the present of the process of t without man; and finally, the present era, in which that master species has existed in supremacy over all. Taking creation, then, as a broad course of progressive organization, the theory of development is thus set forth:—All animal and vegetable organisms commence with a simple cell, of which it is impossible in any case to tell to what form it is destined to advance. A series of changes takes place, by the careful examination of which it is possible to determine to which class the future animal or vegetable will belong. According to the theory as enuncisted by Von Bär, "a heterogeneous, or special structure, arises out of one more homogeneous or general, and this by a gradual change." At the same time it is contended that the embryo of each grade of being passes through the general condi-tions of the embryos of the grades beneath it. In an embryo of the vertebrate sub-kingdom can be traced the change which will determine whether it will belong to the fish, reptile, bird, or mammal class. In an embryo of the mammal class, the characters of the particular order are next determined; and afterwards those of the family, genus, species, sex, and individual in succession. As an illustration,—"There is no essen-tial difference between the vertebral column of the early embryo of man and that of an embryo fish; the evolution of the nervous centres begins, in both, on the same plan; so also does that of the circulating apparatus." Comparing the changes through which the embryo passes, with the history of the general life of the globe, a strong similarity in the plan is to be observed in the individual life of every one of the forms of organized beings which now people it. There has been a succession from invertebrate to vertebrate; from the fish to the reptile, from the reptile to the bird which God had bestowed upon them and their forefathers from their departure out of Egypt,—the victories is
which, by divine assistance, they had obtained over
their enemies,—their rebellion, ingratitude, and chastisements. The moral, ceremonial, and judicial laws
tree repeated, with additions and explanations; and
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the people are urged to obedience in the most affect
that a chemico-clotric operation, by which germinat
tionate manner, from the consideration of the endearorganic creation, and that the second was an advance of these through a succession of higher grades, and a variety of modifications, in accordance with laws of the same absolute nature as those by which the Almighty rules the physical department of nature. The theory of development was strongly and ably opposed by Mr. Hugh Miller, Professor Sedgwick, Dr. Hitchcock, and others, who argued that it was immoral and anti-Christian to doubt the generally received theory of creation by law; namely, that every event in nature takes place by fixed and not by progressive law. Notwithstanding the strong opposition the theory has received, it has gained many supporters. Since the organic creation, and that the second was an advance received, it has gained many supporters. Since the year 1859, when Mr. Darwin published his "Origin of Species by Natural Selection," the subject has excited much attention. In this work Mr. Darwin brings forward an hypothesis of the becoming of new species, founded on the modifiability of which animals are seen to be capable under breeding. The principal suggestion in the work is, that in the struggle for existence among the multitudes of animals, any variety which was better adapted for the circumstances than its com-panions, would live and increase while the other-declined. He thus traces all animals back to four or five primitive types, rejecting the theory of develop-ment, and referring all the phenomena to an advance or improvement in progress.—Besides the works referred to, see Explanations, a Sequet to Vestiges, &c.; and Edinburgh Review, April, 1860, art. Darwin on the Origin of Species.

DEVICE, de-vise' (Mediæv. Lat. divisa, a design), the name given to any emblem selected by a person, family, or body of men, to serve as a mark of distinction. The device is often accompanied by a motto, and is similar in purpose to the crest, or any charge in a coat of arms. It differed, however, from the family crest of the hearer, in having some characteristic in allusion to his name, character, or some enterprise in which he was implicated or about to encare. The cruss in a was implicated or about to engage. The cross, in a variety of forms, was the common device of the Crusaders; the sprig of broom (planta genista) was the device of the Plantagenets; the red and white rose, respectively, were the devices of the rival houses of York and Lancaster; while the rose and portcullis, and rose and crown, were the emblems of the house of

Tudor.

DEVIL, dev'-l (Gr. diabolos, false accuser; Heb. Satur, adversary), is the name commonly given in the New Testament to the arch-fiend, who is represented as being in constant opposition to God, and the ruler of a host of evil spirits like himself. Originally created good, he and his followers fell into sin, and so became wicked and malicious. Retaining many of his original qualities, he became a powerful instrument for evil. He was the means of deceiving our first parents, and leading them into sin, and thus brought sin and suffer-ing into this world. There are various other names ing into this world. There are various other names applied to the devil in Scripture. There are some persons in the present day who deny the personality of Satan, and regard him only as an evil principle. Such an opinion can only be held by doing the utmost violence to the language of Scripture. He is everywhere the probability of the proposal evil. where there spoken of as having a real personal existence, as being in a state of constant activity, possessed of power and dominion, and as having measengers and followers. He is held accountable, is charged with guilt, and is to be judged and receive final punishment. How, on any such idea, Christ's temptation in the wilderness can be accounted for, we cannot see. If we believe in the existence of good spirits (and there is certainly no reason to think that man is the highest creature in the scale of being, there is no reason to doubt the existence of evil spirits. Scripture speaks as plainly and decidedly regarding the existence of the one as of the other.

DEFINE, de-vise (Fr. deviser, to imagine or invent), in Law, is the act whereby a testator conveys his lands by will, the conveyance of personal property being commonly termed a bequest. (See WILL.)

DEVORIAN SYSTEM. (See OLD RED SANDSTONE.)

DEW, dew (Sax. deaw), the moisture or aqueous vapour which is deposited from the air on those bodies which are exposed to it. It is generally observed in the form of minute globules on the surfaces of leaves. When the cold is extreme, it takes a solid form, and

appears as hoar-frost. When the atmosphere is at any given temperature and pressure, it holds a proportionate quantity of aqueous vapour in suspension. temperature is lowered to a certain point, called the temperature is lowered to a certain point, called the dew-point, a quantity of aqueous vapour is set free in the form of water or dew, which can sometimes be seen falling as a fine rain or mist. Those substances which radiate heat rapidly are cooled soonest; and therefore the dew is deposited upon them first. All vegetable fibres are ready radiators of heat; consequently, the smooth leaves of trees, shrubs, and grasses cause the smooth leaves of trees, shrubs, and grasses cause the dew to be deposited upon them even upon moderately warm evenings. Radiation takes place most rapidly when there is a clear sky: when there are many clouds in the air, heat is radiated back by them to the earth, which nearly supplies the amount of heat lost. Thus dew is more readily deposited upon clear fine nights than when the sky is overcast. The history of the knowledge of dew is interesting. Aristotle supposed that there was a rain formed by the condensation of the water which had been evaporated during the day, by the cold of night. (Meteor. i. 10.) In 1784, however, the recognized opinion was, that the cold was caused by the dew. It was not until the discoveries of Leslie concerning radiant heat, in 1794-5, that the

of Leslie concerning radiant heat, in 1794-5, that the true theory of dew was established
DEW-POINT. (See DEW.)
DEXTRIN, deks'-trin, in Chem., a transparent brittle solid, with a vireous fracture, formed by submitting starch to a heat of 400° Fah. Dextrin is a modification of starch, possessing the same composition, but dif-ferent properties. It is, for instance, soluble in cold water, a property which renders it particularly valuable for manufacturing purposes, under the name of British gum (which see). It has received the name of British gum (which see). It has received the name of British gum (which see). It has received the name of British gum (which see). It has received the name of British from causing the rotation of a polarized ray from left to right. It may be always distinguished from starch by not giving a blue colour with iodine; and from gum, by giving a blue solution with potash and sulphate of

DEX, dai, is a Turkish title of dignity, now applied only to the ruler of Tripoli, but formerly borne also by only to the ruler of Tripoli, but formerly borne also by the ruler of Tunis, and, prior to its conquest by the French, by that of Algiers. The word is of doubtful origin; but, according to some, it is from the Turkish dai, a maternal uncle, to denote the high esteem in which the rulers of these countries were held by the

Porte.

DIABETES, di-ŭ-be'-tees (Gr. dia, through, and bainomai, I pass), in Med., is a disease characterized by an inordinate flow of trine. Medical men recognize two distinct kinds of diabetes, - the diabetes insipidus, in which there is merely a greatly-increased flow of urine; and diabetes mellitus, in which the urine is found to contain a large quantity of saccharine matter. Persons of a debilitated constitution, and in the decline of life, are most subject to this disease. It commonly comes on slowly and imperceptibly, without any apparent disorder of the system, and may exist for a considerable time before it attracts any notice. One of the most constant symptoms of this disease is an inordinate degree of thirst; and yet the quantity of urine passed daily is usually much greater than that of the plassed daily is usually much greater state state of the liquids drunk. A vorscious appetite is also a usual characteristic of this disease. At length the constitution manifestly suffers, the body becomes emaciated, the strength and vigour fail, the pulse is frequent and small, a slight degree of fever prevails, and the skin is dry and rough. There are also usually sching pains in the back and loins, and uneasy sensations along the urinary passages. The symptoms gradually become urinary passages. The symptoms gradually become more and more intense, until at length the patient sinks from exhaustion, or is cut off by dropsy, consumption, or some other incurable disease. Of the causes or treatment of this disease, unfortunately, little is known. It may be produced by intemperate habits, or whatever tends to impair the system and produce debility. In general, the kidneys are found in a diseased state after death, though in some cases no traces of disease could be found in these or any of the other uninary organs. In fact, as yet little is known the other urinary organs. In fact, as yet little is known of the true character of this disease. The measures resorted to in its treatment are rather of a polliative than a remedial nature; for the general opinion among physicians is, that it is incurable. It is possible, how-

#### Diadem

ever, by judicious treatment, to greatly mitigate the symptoms, and to ward off the issue for a number of years. The treatment should be principally directed to restoring and strengthening the tone of the system, to restoring and strengthening the bone of the system, by abundant exercise in the open air, and the use of tonics and such medicines as tend to scothe the nervous system. The state of the skin is particularly to be attended to; and daily ablution of the whole body in warm or cold water is recommended. The Turkish bath, it is believed, might possibly prove useful in this disorder. Flannel should also be worm next the skin. Those kinds of food that contain sugar, or matter easily convertible into sugar, are to be as much matter easily convertible into sugar, are to be as much

matter easily convertible into sugar, are to be as much as possible avoided.

Diadem, di'-ā-dem (Gr. diadema, a fillet), originally a band of silk or woollen, according to some authorities invented by Bacchus, to relieve the headache produced by intoxication. It was probably imported into Greek costume from the East, and afterwards became the distinguishing ornament of royalty. The diadem of the Egyptian deities and kings bore the symbol of the sacred serpent. Among the Persians it was twined about the tiaras of the kings, and was purple and white. In the earliest times the diadem was very approve but, broad diadems were introduced by the marrow; but broad diadems were introduced by the Persians, and adopted by Alexander the Great. The early Roman emperors abstained from the use of this ornament, to avoid giving offence to the people by calling up the remembrance of the kings. Constantine the Great was the first who used it; and after his time it was ornamented with a single or double row of

DIERRESIS, di-er'-c-sis (Gr. diaireo, I divide), in Gram., is the dividing of a diphthong or of a contracted syllable into two syllables, and is usually denoted by two dots, thus (\*\*), over the last vowel; as avenged, beloved. Sometimes the mark of discress is used to show that two vowels coming together do not form a

diphthoug; as reiterated.

Diagnosts, di-ag-no'-sis (Gr. diagignosko, I discern or distinguish), is the art of discovering the nature of a disease, and of distinguishing it from other diseases of a similar nature. Much depends upon a correct diagnosis of disease; and the minute characteristics that frequently distinguish one disease from another render it often a matter of great skill and delicacy. If the true nature of a disease be not ascertained, a course of treatment may be pursued that may be followed by very serious results.

DIAGONAL, di-hy'-o-nal (Gr. dia, through; gonia, an angle), a straight line drawn from any angle to an opposite one in a rectilineal figure. A straight line iwn between two adjacent angles would obviously coincide with the boundary-line; consequently no triangle can have a diagonal. A quadrilateral figure has two diagonals, a pentagon five, a hexagon nine, &c. In order to calculate the number of possible diagonals in a given figure, the plan is, to take three from the number of sides, multiply the remainder by the number of sides, and take half the product. Thus,-

In the case of a pentagon, 
$$\frac{2\times5}{3}=5$$
, and

In the case of a horagon,  $\frac{3\times6}{2}=9$ .

DIAGRAM, di'-ageram (Gr. diagramma), a drawing delineated for the purpose of demonstrating the properties of any geometrical figure; such as a triangle, a circle, a square, &c.

DIAL. (See SUNDIAL and HOBOLOGY.)

DIALECT, di'-d-lekt (Gr. dialegesthai, to converse), a term applied to a language which resembles another in its general features, but differs from it in details. The two most widely-spread families of languages in the world are the Indian-Gothic and the Semitic. In the former are included the Sauscrit, Zend, Armenian, Greek, Latin, Lithuanian, Sclavonian, Teutonic, and

# Dialogue

peculiarity is called patois, and in England provincialism

DIALECTION, di-M-lek'-tike (Gr. dialektikos, from dialegomai, I discourse), is the old name for logic, or the art of reasoning and disputing justly. According to Socrates, dialectics were so called from being an inquiry pursued by persons who take counsel together, separating the subjects considered according to their kinds. There were several systems of dialectics among the ancients. The dislectics of Plato are a kind of analysis to direct the human mind by dividing, defining, and bringing things to the first truth; which having reached, it applies itself to explain sensible things, but can rest. The dialectics of Aristotle comprise the doctrine of simple words, delivered in his book of Predicaments; the doctrine of propositions, contained in his book "De Interpretatione;" and that of the several kinds of sulprises may be hooked of Arabytics several kinds of syllogism, in his books of Analytics, Topics, and Elenchuses. The dialectics of the Stoics Topics, and Elenchuses. The dialectics of the Stoics appear to have been little more than a system of

grammatical rules. (See Logic.)

Dialityst, di-ai'-le-um, in Bot., a gen. of leguminous plants. The only remarkable species is D. indicum, which yields a fruit called the tamarind plum, the pulp

of which has an agreeable slightly acidulous tasts, somewhat resembling that of the common tamarind. DIALLAGE, di-al-lij (Gr. diallege, difference), in Min., a foliated silicio-magnesian mineral, so called from its changeable colour.

DIALLOGITE, di-nil'-lo-jite, in Min., a carbonate of

DIALLOGITE, di-ill-lo-jite, in Min., a carbonate of manganese, occurring in crystalline masses of a rose-red colour. It is found chiefly in gueiss and porphyry veins, with silver, lead, zinc, and other ores. It is found in Saxony and Transylvania.

DIALOGUE, di'-āl-og (Gr.), is a conversation between two or more persons, usually upon a particular subject, and conducted with more formality than an ordinary conversation. The ancient philosophers were fond of conveying their instructions in this form, and some of their principal works that have come down to some of their principal works that have come down to us are in dialogues. Plato is particularly distinguished for the heauty of his dialogues, which, for richness and for the beauty of his dialogues, which, for richness and power of imagination, are unrivalled, and have often been compared to the conversations of the gods. The dialogues of Cicero, as "De Oratore," are agreeable and well supported; but the style is sometimes profix and heavy, and the orator too often peeps out in them. Lucian is also distinguished as a writer of dialogues full of pleasantry and satire. In modern times we have the learned and cluborate dialogues of Erasmus, in Latin, besides whom there are among the Gare. have the learned and claborate dialogues of Leasmus, in Latin; besides whom, there are, among the Germans, Lessing, Mendelssohn, Herder, Jacobi, Schelling, &c.; Petrarch and Machiavelli, among the Italians; and Fánelen, Fontenelle, Malebranche, and Sarrassin, among the French. In England we have the "Divince Dialogues" of Henry More; the "Visions of Heaven and Hell," said to be Bunyan's; the "Philosophics! Dialogues." of Barkeley, the dialogues of martral religions. and Hell," said to be Bunyan's; the "Philosophical Dialognes" of Berkeley; the dialognes on natural religion of Hume; the moral and politionl dialognes of Bishop Hurd; Lyttleton's "Dialognes of the Dead;" and many others. Still more recently have appeared Southey's "Colloquies on Society;" Walter Savage Landor's "Imaginary Conversations;" Help's "Friends in Council;" and Professor Wilson's "Noctes Ambrosiane." To write in dialogue is by no means so casy a task as is commonly imagined. It requires more than merely the introduction of different persons speaking in succession. It ought to be a natural and speaking in succession. It ought to be a natural and spirited representation of real conversation, exhibiting the character and manners of the several speakers, and suiting to the character of each that peculiarity of thought and expression that distinguishes him from others. From a dialogue thus conducted, the reader receives a fair and full view of both sides of the argument, and is at the same time entertained with polite conversation, and with a display of consistent and well-supported characters. Such a production stands high among the works of taste. The so-called Socratio Greek, Latin, Lithnanian, Sciavonian, Teutonic, and Ingh among the works of taste. The so-caused coerasic Celtic dialects. In all these, the resemblance, although dialogue is a conversation in the form of question and often far distant, is able to be traced. The Semition answer, in which the questions are so contrived, that embraces the Hebrew, Syriac, Arabic, and other dialects not a well known. The differences of speaking the person questioned is led to come to the very conclusion that the questioner wishes to bring him. "There the same language in the same country do not properly are some questione," says Hame, "to which dialogue come under the head of dialects. In France any such writing is peculiarly adapted, and where it is preferable

to the direct and simple method of composition. . . Any question of philosophy which is so obscure and uncertain that human reason can reach no fixed determination with regard to it, if it should be treated at all, seems to lead us unturally into the style of dialogue and conversation. Reasonable men may be allowed to differ where no one can reasonably be positive; oppo-site sentiments, even without any decision, afford an agreeable amusement; and if the subject be curious and interesting, the book carries us in a manner into company, and unites the two greatest and purest pleasures of human life,—study and society." He also considers it useful in handling points that are so obtained to the company and the second considers of the second considers and we are important to the second considers. ous as not to admit of dispute, and yet so important that they cannot be too often inculcated; the vivacity

that they cannot be too often inculcated; the vivacity of conversation serving to enforce the precept, and give it novekly and beauty, from the various lights in which it is presented by the different personages.

DIALYSIS, di-dil-e-sis (dia, through, and luo, I set free), in Chem., a method invented by Mr. T. Graham of separating the crystalloid and colloid constituents of solutions, by taking advantage of the property possessed by the former of passing through a septum of colloid matter. (See DIFFUSION or LIQUIDS.) It is generally effected by means of an instrument calle' a dialyser, which consists of a hoop of gutta-percha covered with a sheet of parchmentized paper strained tightly, and kept in its place by an india-rubber band. The solution to be dialyzed is poured into the dialyser to the depth of half an inch, and the whole is floated in a basin of pure water. The crystalloids floated in a basin of pure water. The crystalloids contained in the liquid diffuse themselves through the parchment-paper into the water below, but the colloids are retained behind the colloidal parchment-paper, being impervious to them. A mixture of common salt being impervious to them. A mixture of common sair and gum placed in the dialyser for thirty or forty hours parts with the whole of its sait, the gum being left behind in pure condition. Other substances besides parchment-paper may be used; such as a layer of albumen brushed on writing-paper and coagulated by beat, or a film of animal mucus laid between two pieces of linen. Dialysis promises to be of the greatest use in separating crystalline principles, such as the alkaloids, from vegetable infusious. It may also the airsholds, from vegetable infusions. It may also be applied to the detection of crystalline poisons, such as arsenic or strychnine, in animal mixtures, no matter how heterogeneous the compound may be. It also throws great light on many obscure points in animal physiology. The ready absorption of crystalline matters by the stomach, which is a membrane covered with colloid mucus, and the reparation thus effected of the crystalloid and colloid portions of the food, are instances of dialysis going on in the human frame. Another example is the tongue, the mucous membrane of which readily transmits crystalloid salt and sugar to the nerves of taste; while gum, starch, and other col-loids, are either rejected altogether or only feebly ab-sorbed. For a full account of Mr. Graham's experisortical. For a time account of mr. Gramam s experiments on dialysis the student is referred to a paper on the subject, in the "Philosophical Transactions" for 1862, part I., which is one of the most masterly scientable memoirs ever written.

thic memoirs ever written.

DIAMAGNETISM. (See MAGNETISM.)

DIAMETER, disan'e-ter (Gr. dia, through; metron, a measure), a term generally applied to the line drawn through the centre of a circle, and bounded at either end by the circumference. Whenever any point is

end by the circumference. Whenever any goint is called a centre, any straight line drawn through that point is generally called the diameter.

DIAMIDE, di'-u-mide, in Chem.—A diamide is a substitution compound of ammonia, in which two equivalents of bydrogen in a double equivalent of ammonia are replaced by one eqvivalent of an element or radials. diela.

DIAMINE, di'-a-mine, in Chem., a diamide with basic

properties capable of forming salts with acids.

Diamond, di'-ā-mond, in Min.—The word diamond is derived from the Greek adamas, unconquered, in allusion to its extreme hardness. Chemically speaking, diamond is pure crystallized carbon. As found in nature, diamonds occur crystallized in forms belonging to the regular system. The crystals are mostly derived from the octahedron; but the faces are frequently convex, and the edges rounded. In their rough state they present the appearance of sensi-transparent rounded RL

pebbles, covered with a thin brownish opaque crust. Rreed from this coating, they are generally coleuriess; but they are also found tinged with red, orange, yellow, brown, and black. The pure white transparent variety are most highly prized, and are called diamonds of the first water. The finest diamonds occur in quartzose alluvial deposits at Golconda and Bundelound, in India, where the finest specimens have been found; also in Borneo, in several districts in Brazil, in the Ural mountains, in Russia, and in one or two other unimnortant Borneo, in several districts in Brazil, in the Ural mountains, in Russis, and in one or two other unimportant localities. The origin of the diamond in nature is at present unknown. It is, however, evidently of vegetable origin. Diamond is the hardest body known, and can only be cut or polished by means of its own powder. The powder is mixed with oil, and spread on a revolving steel disk, and the diamond, which is attached with solder to a suitable support, is held against it until a facet is formed. It is then unsoldered, fixed in a different position, and a second facet ground. The most remarkable diamonds with which we are acquainted, are the diamond mentioned by Tavernier, as belonging to the Great Mogul, which is said to have weighed 900 carates in the rough state; the diamond amongst the Russian in the rough state; the diamond amongst the Russian crown jowels, weighing 195 carats; the famous Pitt diamond, which weighs 196 carats. This diamond is, from its lustre and colour, considered the finest known. The Kohinoor belonging to the queen, weighed 213 carats, but was badly cut. It was re-cut in 1852 by Messrs. Gunard, and now weighs 147 carats; but is greatly improved in brilliancy, although lessened in size. Diamonds are valued at so much per carat of four grains, and increase in price in a given proportion. The general rule for finding the value of cut diamonds, is to double the weight in carats, and multiply its square by £2. This rule does not apply to diamonds weighing out by cleavage through the natural planes of the crystal. A distinguished English philosopher made a crystal. A distinguished English philosopher made a large sum of money by buying flawed diamonds at a low price, and cleaving them into smaller gems. The principal use to which diamonds are applied, besides as articles of ornament, is for cutting glass. For this purpose, the natural curved edge is used. Writing diamonds are either sparks with natural or accidental points, or diamonds ground to a conical point. Diamond-dust is employed for grinding the faces of other gems. Diamonds are inflammable when heated reduct and shunged into an expendence of Gyrgen burns. hot, and plunged into an atmosphere of oxygen, burning with a steady light, and giving rise to pure carbonic acid. They are not, however, perfectly pure, a small residue being left behind, containing silica and iron.

The specific gravity of diamond is about 3.34.

DIAMOND REELES, a name usually given to Entimus imperialis, a species of the tribe Curculionida (weevils), and order Coleoptera, found abundantly in Brazil. It is polished black in colour, the head, thorax, and limbs being slightly granulated and covered with metallio



DIAMOND BEETLE.

green scales, and the wing-cases (elytra) studded with regular lines of concavities, each depression thickly lined with bright green scales, so that the rays of light are reflected and heightened by the contrast of the shining black interstices. The genus Entisus is entirely exotic; but there are small species of the genera Polydrosus and Phyllobius common in England, orns-

#### Dismond Necklace

mented with similar scales, but not presenting the gem-like spots. The elytra of the diamond-beetle are sometimes made into head-dresses, &c., for ladies; but the most general use of the insect is as an object for

the microscope.

DIAMOND NECKLACS, THE, a famous piece of jewellery, made by a man named Boehmer, in Paris, about the years 1744-45. According to Madame Campan, it was originally intended for Madame Du Barry, the favourite of Louis XV. On the death of the king, in 1744, Du Barry was compelled to leave the court, and Boehmer was left with the necklace on his hands. It was a wonderful and costly piece of work, consisting of 500 diamonds. Its value was said to be 1,800,000 for any one to buy it. A woman named De Lamotte, who waited about the court, having heard of these circumstances, contrived to persuade the Cardinal Prince Louis de Rohan, a vain profligate man of great wealth, that Queen Marie Antoinette did not look upon him with disfavour. The vain cardinal, readily believing this, was ready to do anything to retain the regard of the queen. He was persuaded by Do Lamotte that Marie Antoinette was extremely anxious to possess the diamond necklace; but not having enough money then, she was willing to sign an agreement to purchase it, if the cardinal would become security. Rohan did consent, and signed the agreement, security. Rohandid consent, and signed by the queen. On the 1st of February, 1786, the necklace was handed over to him, and he took it to Versailles, the place where the queen had undertaken to send for it. All this time the cardinal had never seen the queen, although, by a stratagem of De Lamotte's, he imagined that he had met her for a few moments at midnight in the park of Versailles, and all the messages, written and verbal, had come through the woman De Lamotte. On the day after he arrived at Versailles, a man dressed in the uniform of the court valets came to his apart-ments, and took away the necklace, saying, as he did so, that it was " in the name of the queen.' Almost imthat it was "in the name of the queen." Almost immediately afterwards, De Lamotte, her husband, and the sham valet, left Paris. The whole transaction had been a deception and a swindle. The verbal messages from the queen were all false, and the written one forgeries by the sham talet, who was an adept at imitating handwriting; and the woman whom the cardinal had met in the park of Versailles was not the queen, but an unfortunate of Paris, named Gay d'Oliva, who but an unfortunate of raris, named day d'ava, mo had been hired by De Lamotte for the purpose. The plot was discovered by Boehmer, who, when he found that he was not paid when the period for the first instalment arrived, inquired at the court if the queen had received the necklace. This arcused suspicion, and inquiries being instituted, the cardinal and the persons associated in the plot were arrested and sent to the Bastille. The trial lasted nine months, and sentence was given on the 31st of May, 1786, when all were acquitted except Lamotte, who was branded on the shoulder with the letter V, for volcuse, thief. When the cardinal got out of the Bastille, at ten o'clock at night, large mobs hurrahed round him, out of spite to the court. It was the beginning of the Revolution. Seven years afterwards Marie Antoinette was led to execution, and the yelling and cursing mob taunted her with the scandal of the diamond necklace a few moments before she died.

DIANTHUS, die d'itales (Gr. anthos, flower; dios, of Jupiter,—the divine flower), in Bot., a gen. of plants belonging to the nat. ord. Caryophyllaces. Many of the species are highly valued for the beauty and the fragrance of their flowers. D. barbatus, the sweet-william, is an old inhabitant of the flower-garden, and was much esteemed in Gerarde's time "for its beauty was much esteemed in Gerarde's time "for its beauty to deck up the bosoms of the beautiful, and garlands and crowns of pleasure." The flowers grow in fascicles, and are usually of a fine orimson colour. There are numerous varieties in cultivation. The species D. curyophyllus, which grows wild on old walls in the south of England, is supposed to be the source of the garden carnations, and, by some botanists, of the Thike also. The carnation has been cultivated from this immerancial in Europe, and its heavy and rich time immemorial in Europe, and its beauty and rich spicy odour make it a general favourite. It is the principal florist's flower of Germany and Italy, from

## Diaper-work

which countries we derive the choicest varieties. varieties of the carnation are arranged in three classes, -flakes, bizarres, and picotess. Flakes have two colours only, the stripes being large; bizarres (Fr., odd or irregular) are variegated in irregular spots and or irregular) are variegated in irregular spots that stripes, with no less than three colours; picotees (Fr. piquettie, pricked or spotted) have a white ground spotted or pounced with red, purple, or other colours. The garden cloves have petals of a deep scarlet colour, and are derived, like the varieties of the carnation. from D. caryophyllus. The pink, as a florist's flower, received but little attention until the close of the last century, but many fine varieties have been developed since then. Being one of the hardiest and least expensive of fine flowers, it is much cultivated by opera-tive mechanics and manufacturers round large towns. The varieties most esteemed are those called pheasant's eyes, which seem to have sprung from D. plumarius. New varieties of the carnation and pink are procured from seeds, and thousands of seedlings are annually blown by florists and amateurs, though it frequently happens that there are not more than two or three worth keeping. Established or approved varieties are continued by layering and by cuttings, or, as they are commonly called, pipings. The soil in which they commonly called, pipings. The soil in which they thrive best is a rich loam, rather sandy than otherwise.

DIAFASON, di-a-pai-zon (Gr. dia, through; pas, all), in Mus., an ancient Greek term for the interval of the octave. It is also the name of a kind of rule by which certain instrument-makers determine the measures of the various parts of their instruments. Some of the stops in the organ are called by this appellation, be-cause they extend through the entire instrument. Dryden makes use of the term in one of his finest metaphors,-

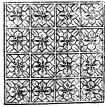
"From harmony, from beavenly harmony, This universal frame began; From harmony to harmony Through all the compass of the notes it ran, The diapason closing full in man.

DIAPENSIACE E, di-ap-en-se-ai'-se-e (Gr. dia, through; pente, five ; in allusion to their being five-cleft), in Bot., a small nat. ord. of dicotyledonous shrubby plants in the sub-class Corolliflora. There are but two genera and two species, the properties and uses of which are unknown. They are natives of North America and unknown. They northern Europe.

DIAPER, di'-ap-er (Fr.), a kind of textile fabric, either of linen or cotton, or a mixture of the two, with a figured pattern on the exterior surface, produced by a peculiar method of twilling. Diapers are much used for table-linen and fine towels. With the exception of damask, diapers are the most ornamental kind of twilled cloths. There is some controvers as to the origin of the term diaper. According to Mr. Planché, it is derived from d'Ipres, that is, "of Ypres," a town is Flanders famous for its manufacture of rich stuffs and fine linen before the year 1200. Ducange derives the of its shifting lights; but the former is the most probable derivation.

DIAPER-WORK, or DIAPERING, in Arch., is a mode of decorating a surface by covering it with the constant

repetition of a small flower, leaf, or other or-nament, either carved or painted. If carved, the flowers are entirely sunk into the work below the general surface. are generally square, and placed close to one another; but in some cases other arrangements are used, as in Canterbury cathedral. Disper deco-ration was first intro-duced in the Early Eng-



duced in the Early Eng.

lish style, in which it was tometimes employed to cover large spaces, as in Westminster Abbey and Chichester cathedral. It was also extensively used in the Decorated style. Diaper-work was only used as a painted ornament in the Perpendicular style, and very few specimens of it remain. Some portions of a pattern of

# Disphanous Bodies

beautiful flowing foliage are to he seem in the Lady chapel in Gloucester cathedral.—Ref. Parker's Glossary of Architecture.

DIAPHANOUS BODIES. (See LIGHT.)

DIAPHORETICS, di-d-fo-red-its (Gr. diaphoreo, I carry through), a name given to medicines that increase the natural exhalation of the skim. When they are so powerful as to produce actual perspiration, they are called audorifics, the difference between the two classes being only one of degree, not of kind. They are classes being only one of degree, not of Killd. They are in general used to restore the cutaneous discharge when it has been suppressed through cold, and are hence useful in catarrh, rheumatism, or diarrhon proceeding from cold. Among the more common diaphoretics are antimony, ipecacuanha, ammonia, opium, guiacum, camphor, and contrayerva. A dose of Dover's powder, with warm drinks and plenty of blankets in bed, usually predices acousing paragraphic and is yety beneficial. produces copious perspiration, and is very beneficial in colds.

DIAPHEAGM, di-a-fram (Gr. diaphragma, 8 parti-tion), in Anat., is the name given to that transverse muscle which separates the thorax or chest from the abdomen or belly. It is usually described as consisting of two muscles. The superior and larger of these arises from the ensiform cartilage of the sternum, and the ends of the lower ribs on each side; from which points the fibres converge, and terminate in a tendon. or aponeurosis, termed the centrum tendinosum, or central tendon. The second and inferior muscle springs from the vertebræ of the loins by two productions, or crura; that on the right side from the four upper lumbar vertebræ, that on the left from the three upper ones. From these points the fibres ascend, some of them crossing over and decussating to surround the esophageal opening; but all of them ultimately uniting with the central tendon, and thus making but one muscular partition. The diaphragm is convex superiorly and concave inferiorly, and is covered on it apper side by the pleura, and on the lower by the peritongum. In form it is nearly circular, and is fleshy at the edges, but becomes tendinous towards the centre.

It presents three large openings and several smaller ones. The opening of the vens cava is quadrangular ones. The opening of the vens cars is quadrangular in form, and is situated in the tendinous centre. The cesophagesl opening is posterior to that of the vens cava, and is of an elliptic form. The sortic opening is the most posterior, triangular, and between the crura. This muscle is the principal agent in respiration; for by contracting it enlarges the cavity of the chest, and allows the lungs to receive the air in inspiration, while by being relaxed, the cavity of the chest is again diminished, and the air suddenly expelled. The contracting and relaxing of this muscle must likewise, it is evident, have a similar effect in increasing and diminishevident, have a similar effect in increasing and diministing the size of the abdominal eavity; and hence, by its action upon the stomach and intestines, it sids in the expulsion of the fæces and urine. The diaphragm is largely engaged in laughing, seczing, sighing, schling, and other affections of the respiratory organs. Whatever occasions stoppage of the action of this muscle speedily proves fatal. It is subject to influmnation, called diaphragmativis; but as this is rarely confined to the organ itself, but communicated either to the pleurs or peritoneum, its symptoms and mode of treatment correspond with inflammation of these parts. (See PLEURITIS and PERITONITIS.)

DIABERGA, di-ar-re'-a (Gr. dia, and rheo, I flow), is a disease characterized by an increased discharge from the bowels, usually in a very liquid state, and sometimes containing a large quantity of bile. This disease may be occasioned by anything that stimulates or irritates the mucous surface of any portion of the alimentary canal. Besides the various purgative medicines, undressed or indigestible foods or vegetables, acid fruits oily or putric substances, frequently cause diarrhos. Suppressed perspiration, occasioned by a sudden chill or cold applied to the body, or a draught of any cold liquid when overheated, may produce it. It is more apt to occur during the summer and autumn months than at any other period of the year. The effluvia arising from the decomposition of organic substances is a frequent cause of it. It sometimes results from the irritation caused by worms, or by some organic disease, and is a common symptom of the advanced state of consumption. Besides looseness of the bewels, this disease is

#### Diatomaces

usually accompanied with griping and flatulency, together with an uneasy sensation in the lower part of the abdomen. There are frequently, also, nauses and vomiting, a bitter taste in the mouth, a furred and yellow tongue, dry and harsh skin, a pale or sallow countenance, and, if not speedily checked, great emaciation. Physicians distinguish various kinds of dischlored and the statement of the diarrhoa; as crapulosa, when the faces pass of ordinary quality, but immoderately loose and copious; biliosa, when the bile is more abundant than natural; mucosa, when the excrements contain a quantity of mucus; serosa, in which they are almost entirely iquid and watery; and lienteria, when the food passes through the body in an almost unaltered state. This is one of those diseases by means of which nature strives to get rid of impurities, and restore the system to its normal condition. Hence, when it is not very violent, and when the patient is strong, it is best to allow it to run its course, at all events for a time, and even to sid it by small doses of laxatives. In any case, great care is to be taken not to stop it too suddenly. Sometimes an emetic is of great benefit in removing the cause of irritation. When it arises from obstructed perspiration, a warm bath, or a dose of Dover's powder, and warm clothing in bed, will usually effect a cure. When it is occasioned by a too acid state of the secretions, the great remedy is chalk mixture. Opium is also frequently employed; but it should not be taken in large quantities without medical advice. The treatment thus in all cases depends upon the cause from which it springs.

DIARY, di'a-re (Lat. diarium, from dies, a day), is strictly a daily register or record of occurrences in which the writer has had a personal share, or which have at least in some way come under his own observation. The use of diaries has now become so common in this country that the manufacture of them forms an important branch of trade. They are usually prepared with a blank space for every day of the year, and vary in form and size according to the object they are more particularly intended to serve. Usually one book is in-tended to contain the events of a year. The use of diaries cannot be too strongly recommended. chant and man of business they form a register of transactions and engagements; to the student and man of letters a record of daily readings, thought, and observation. The publication of such diaries as those of Pepys and Evelyn has thrown much light upon the state of society at the time when the writers lived.

Diastase, di-as-tare (Gr. diastass, a separating of parts), in Chem., a peculiar ferment found in all germinating seeds. It is this principle which causes the starch in malt to be converted first into dextrin and then into sugar. When barley is malted, diastance in the starch in the starch in the starch in the second of the starch in the starch in the starch in the second of th and then into sugar. When barley is malted, dis-stase is developed in the grain, which converts the starch into sugar, on the application of heat and water

in the operation of mashing.

Diastole, di'-as-tole (Gr. dia, and stello, I stretch), in Phys., is applied to the dilatation of the heart and arteries, and is opposed to systole, which denotes the

contraction of these parts.
DIATHESIS, di-ath'-e-sis (Gr. diatithemi, I dispose). in Med., is applied to a certain state of body predis-posing it to certain diseases. Thus the scrothless, gouty, cancerous diathesis, denotes a certain constitugonty, canderous distributions, denote a certain favourable conditions or exciting causes, to these diseases.

Diatomack, di-di-on-oi-see (Gr. dia, across; tome, cut), in Bot., the Brittleworts, a fam. of con-

fervoid algae, of very peculiar character, consisting of microscopic brittle organisms, found in almost all fresh, brackish, or salt water, sometimes forming a uniform yellowish-brown layer at the bottom the water, at others adhering to various waterplants, decaying stems, and stones, or scattered be-tween the filaments of Conferve. They also occur smong mosses and Oscillatories, and on damp ground. The individual cells of the Diatomacee are called frus-The individual cells of the Diatomaces are called frustules or testules, and are furnished with an external cost of silica. This fiinty cost, of two usually symmetrical portions or valves, is comparable with those of a bivalve shell, but is in contact, at its margins, with an intermediate piece called the hoop, which varies in breadth according to age. The separate valves are of various forms; as circular, oblong, ellip-

#### Distonic

tical, linear, saddle-shaped, boat-shaped, and undulate; and their broad surfaces exhibit various more or less delieste sculpturings and markings, in the form of bands, lines, either parallel, radiate, or corossing each other, and dots, or a cellular appearance. The Desmidiacea are regarded by Professor Bentley, whose classification we have adopted in this work, as a section of the sub-order Diatomacea; but those writers who have devoted special attention to microscopic plauts make each group a distinct family. The Desmidiacea are found only in fresh water, are generally of a green colour, and are not silicious externally.—in place of colour, and are not silicious externally,—in place of the flinty sheath of the distom, there is a very transparent coat of cellulose. The study of the humble forms of vegetable life included in these two interestforms of vegetable life included in these two interesting families is pursued with great zeal by our leading
microscopists, and new facts are continually being
ascertained respecting their reproduction and movements.—Ref. Micographic Dictionary, by Griffith and
Hentrey; Pritchard's Infusoria (new edit.); Carpenter's Revelations of the Microscope.
Diatonic (Gr. dia, through, and tonos, a sound).—
Of the three scales employed by the ancient Greeks,
that which consisted like the modern system of inter-

that which consisted, like the modern system, of intervals, of major tones and semitones. The diatonic has long been considered the most natural of these three scales. According to Aristoxenus, it was the first; and the other two, viz., the chromatic and enharmonic, were formed from the division of its intervals.

DIATONIC SCALE .- The natural scale, consisting of eight sounds and seven intervals; five of these intervals are called tones, and the remaining two semitones, which occur between the third and fourth and seventh and eighth. The distonic scale is a gradual succession of sounds by tones and semitones, which may proceed either from acute to grave or vice versa, five whole tones and two semitones making a complete natural octave.

DIATRIBE, di'-a-tribe (Gr., a disputation), is generally a continued discourse or disputation, more particularly a bitter and violent attack, either written or spoken, on any subject.

DIBBLE, dib'-bl (Ang.-Sax.), a well-known gardening implement, made of wood, usually about an inch and a half in dismeter, used for making holes for planting seed, &c. It is pointed, and provided with a handle, by means of which it can be more easily pressed into the ground. In some parts of England wheat is planted with the dibble; several dibbles are joined together, and the handle is made of such a length as to enable the man, as he walks backwards, to make the holes: children follow him, and drop two or three grains into every hole. A considerable saving of seed is effected by sowing with the dibble. Dibbles can only be used in light soils; stiff and clayey soils cannot be treated in this way; the soil grows hard round the hole, hindering the shoots from the seed; at the same time it holds water, which is also detrimental.

Dicast, di-kast (Gr. dikastes), a functionary amongst the ancient Greeks, who, with his colleagues, was empowered constitutionally to try and pass judgment upon all causes and questions that the laws and customs of his country pronounced capable of judicial investigation. The dicasts of the Attic democratic period, when they were selected from the people, and when they took an oath that they would well and truly discharge their duties, closely resembled the English discharge their duties, closely resembled the English jury. The conditions of the eligibility of a dieast at Athens were, that he should be a free citizen, in the enjoyment of his full franchise, and over thirty years of age. Six thousand persons were elected for the service every year. The mode of election is not very clearly stated; but it is evident that they were chosen by lot. Before proceeding to his duties, the dicast was obliged to swear the official oath. After the oath was taken, the courts were assigned to the several sections of dicasts. As soon as the allotment took place, each dieast received a staff, on which was painted the letter Every dieast received a fee for his attendance.

They are

Every dieast received a tee for his attendance.

DIGE, disc (Fr. de), the plural of die. They are
small cubes of ivory or bone, marked with black dots
on their sides, marked from one to six upwards. Dice
are placed in a small tubular box, shaken with the
band, and then thrown out. When the dice are per-

# Dictator

fect in their form as cubes, there is no possibility of knowing what number may be thrown; but amongst swindling gamblers loaded dice are often used, which are so constructed as to turn up a certain number when required. The principal game played with dice is hazard. They are also employed in other games of chance; two dice are used in the game of backgammon. chance; two dice are used in the game of backgammon. Lotteries, raffles, and disputes, are also often settled by throwing a pair of dice. By the act 9 Geo. IV. c. 18, a duty of twenty shillings was imposed upon every pair of properly-made dice. This act was passed for the purpose of suppressing gambling, and since that time all dice have been stamped; and any person issuing dice without the government stamp is liable to a remarke

penalty.

DICHORD, di'-chord (Gr. dis, double, and chord), the name given to the two-stringed lyre, the invention of which is ascribed to Mercury by Apollodorus, who gives us the following account:—" Mercury," says he, "walking on the banks of the Nile, happened to strike his foot against the shell of a tortoise, the flesh of which had head which army by the sun and nothing left of had been dried away by the sun, and nothing left of its contents but nerves. He was so pleased with the its contents but nerves. He was so pleased with the sound it produced, that he thence conceived the idea of a lyre, which he afterwards constructed in the form of a tortoise, and strung it with the dried sinews of animals."

Dick Brovest, dik, is a fund left by Mr. James Dick, of London, a native of Forres, in Morayshire, who amassed a considerable fortune in the Indies, and at his death, in 1828, bequeathed the bulk of it, amounting to upwards of £100,000, as a fund to be applied for the benefit of the parochial schoolmasters of the counties of Moray, Banff, and Aberdeen. This money has been of immense service, not only in increasing the comforts of an underpaid class of men, but in raising the standard of education. The teachers, before participating in the fund, are subjected to a very searching examination; and there is also a visitor appointed to inspect and report periodically upon the condition of their schools. The sum which each teacher receives is thus made to depend upon his qualifications and efficiency in teaching, and at present varies from about £20 to £40, the average being about £30. The sum annually distributed is about £4,000; but a number of teachers do not participate in it, from

not having passed the necessary examination.

DIGER, dik'-er (Gr. deka, ten), is a word used by old authors, signifying ten; as a dicker of skins or hides, —i.e., ten hides; a dicker of gloves, or ten pairs of

DICOTYLEDONES, di-ko-til-e'-dones (Gr. dis, two; kotuledon, a cavity), in Bot., one of the two great classes into which the phanerogamous or flowering plants are divided. It agrees with the Erogenæ of some botanists, and with the Exogens and Gymnogens of Lindley. (See BOTANY.) The name Dicotyledones is derived from the condition of the embryo prevailing throughout the vast majority of plants included in the class; but, as in all other natural groups, instances occur wherein the particular character which has suggested the name is absent. In these exceptional cases, however, the plants agree with the rest in other prominent characters, as the structure of the stem and the plan of the flower. The presence of a pair of cotyledons in the embryo must not, therefore, he regarded as an essential character of the Dicotyledones. though it is presented by most of the plants in this great natural group.

DICTAMNUS, dik-tam'-nus (from Dicte, a mountain of Crete, where it grew), in Bot., a gen. of plants belouging to the nat. ord. Rutacee, including two species, which are commonly cultivated in gardens for the sake 

DICTATOR, dik-tai'-tor (Lat.), the highest magistrate

## Dictionary

in the ancient Roman republic. The first dictator was appointed about the year 253 a.u.c., or 501 n.c. As the consuls possessed equal authority, and often differed in their opinions, jealousy frequently brought disunion into the government. In order to avoid these evils, the dictatorship was established. The dictator united in himself the power of the two consuls, and the authority of all the other magistrates, except that of the tribunes, ceased as soon as he was appointed. He was attended, both within and without the city, by twenty-four lictors, bearing fasces and axes. At first, the dictator was only taken from the patrician order, but in 556 B.C., Marcius Rutilus, a plebeian, was elected. The dictatorship could not lawfully be held longer than rine dictators in could not tawning to ned to loger than six months; but Syllis and Julius Casar were nominated perpetual dictators, the former in 81 B.C., and the latter after his victory at Pharsalus. The title of dictator was declined by Augustus, and was never assumed by the emperors of Rome. In Niebuhr's Roman History the office of dictator is traced back to the Latins, from whom, according to the historian, it was introduced into Rome.

DICTIONARY, dik'-shun-ā-re (modern Lat. dictiona-rium, from dictio, a saying), is a work which professes to give information on an entire subject, or an entire to give information on an entire subject, or an entire branch of a subject, under words or heads arranged in the order of the alphabet. Thus we have dictionaries of Art, Science, and Literature; of Law; of Medicine; of Anatomy and Physiology, &c. In a more limited sense a dictionary is a collection of the words in one or more languages, arranged in alphabetical order, with their significations; as, an English dictionary, au English and French dictionary. It is necessary for a dictionary that the subjects be arranged in alphabetical order, that some explanation or interpretation be attached to each term, and that it professes to go over the whole subject or field of knowledge which it takes up. Dictionaries may be divided into three classes, according as they take up words, facts, or things. Dictionaries of words are generally such as explain in alphabetical order the words composing any language, in the same language, or interpret them by the words of some other. Special dictionaries contain only the words used by single authors or classes of authors. A dicused by single authors or classes of authors. A dictionary usually, also, gives an explanation of phrases; for when it is confined to single words, it is properly only a vocabulary. The Greek term Lexicon is sometimes used as equivalent to dictionary. The term Thesaurus (treasury) is also sometimes used. A glossary (Lat. glossarium) is a dictionary of unusual terms. The ancient Greeks and Romans made use of glossaries of unusual words and phrases, but had no dictionaries of language in our sense of the term. In learning a of language in our sense of the term. In learning a foreign language they seem to have adopted the natural method of conversation. It was not till after the invention of printing, when a taste for the classic languages of antiquity began to prevail, that dictionaries of these languages came into use. The Latin Thesaurus of Robert Stephens made its appearance in 1831, and in 1852 the Greek Thesaurus of Harave 1531; and in 1572 the Greek Thesaurus of Henry 1531; and in 1572 the Greek Thesaurus of Henry Stephens was published. Among the most carefully-compiled dictionaries of modern languages are the "Vocabolario degli Academici della Crusca," of the Italian; and the "Dictionnaire de l'Académie Française," of the French. The Spaniards also possess a dictionary of considerable merit, cutitled "Diccionario de la Lengua Castellana," by the Royal Spanish Academy. In English, Johnson's dictionary, which made its first appearance in 1755, notwithstanding the defeate still replies as a standard work of its class. defects, still ranks as a standard work of its class. defects, still ranks as a standard work of its class. Dr. Richardson's dictionary, which first formed part of the "Encyclopedia Metropolitans," but was afterwards published separately, is rather critical and philosophical than practical, and adopts the principle of giving together all the words derived from the same root. It is particularly valuable for the numerous examples which it gives of the uses of the words.

## Die-sinking

dictionary is a want which has not yet been supplied. The first German dictionary of any note was that of Adelung, in 4 vols., Leipsic, 1774-30. A much more valuable work was that of Campe, "Deutsche Wörterbuch," 5 vols., Brunswick, 1807-11. Immeasurably surpassing it is the "Deutsche Wörterbuch" of the brothers Grimm, of which the first volume appeared in 1854, and which is still in course of publication. For those who wish a list as complete as possible of the dictionaries of all languages, we must refer to Vater's Litteratur der Grammatiken, Lexica und Wörtersammiungen aller Sprachen der Erde, 2nd ed., by Il. Jülg, Berlin, 1817. The second class of dictionaries—those of facts—comprehends dictionaries of History, Jülg, Berlin, 1817. The second class of dictionaries—those of facts—comprehends dictionaries of History, Biography, Geography, &c. They deal chiefly or exclusively with facts that exist, or have existed, or with events that have happened, or are supposed to have happened. They are frequently incorporated or combined with the third class, or dictionaries of things, which will more properly come to be noticed under the head of ENCXCLOPEDIAS.—Ref. English Cuclonedia. Cyclopadia,

DICTUM, dik'-tum (Lat., something said), is properly applied to the arbitrament or award of a judge, but is

applica to the motivament or award of a judge, for an frequently also used to denote a positive assertion.

Did notice, di-ddk-tik (Gr. didusko, I teach), significe speaking or writing in a manner adapted to teach or explain the nature of things. Hence didactic poetry has for its object the communicating of instruction in the form of poetry. In one sense, almost every kind of poetry may be said to be more or less didactic; more particularly, however, it is applied to those case in which the chief object of the poem is to communicate of Virgil, the "De Rerum Natura" of Lucretius, and the "Ars Poetica" of Horace. Though didaction poetry may sometimes attain an elevated and animated character, yet it cannot be denied that the more it becomes diductic, the less, of necessity, is it poetical; for the invention, freedom, and elevation of poetry must be in a great measure dropped. Didactic poetry must have been among the earliest forms of poetic composition, and there is scarcely a nation in which it not taken root; while at the same time there is hardly a subject, however prosaic, that has not found some one to give it a poetic dress. In didactic poems,

some one to give it a poetic cress. In didactic poems, generally, the information or instruction is accompanied with reflections, illustrations, &c.

DIDASCALIA, di-dis-kwi-le-a (Gr., instruction, information), a term in use among the Greeks, and also till recently among most of the nations of modern Europe. It was sometimes applied to the representation of denorstic nature. tion of dramatic pieces, but more particularly to a written addition, in which information is given of the authors and contents of the plays, of the time, place, and success of the representation, &c. Many old and success of the representation, &c. Many old authors have written didascalia, containing not merely theatrical information, but also critical notices of the

thearrean information, but also critical notices of the plays, giving an analysis of the plan and development, the beauties and defects of each.

DIDYMUM, did'-c-mc-um (Gr. didunos, twin), in Chem., a very rare metal, closely allied to cerium, and occurring with it in its ores. It forms one oxide, which has the properties of an earth.

DIE-SINKING, di-sink-ing (Fr. de, die; Sax. sincan, encan, to sink), the art of preparing a die or stamp by which an impression is produced on medals or pieces of which an impression is produced on medials of pieces of money, or any pattern or device on buttons and thin plates of metal, by means of great pressure. When a die is required for a coin or medal, the engraver takes a piece of soft steel of suitable dimensions, generally three or four inches in length, and about an inch greater in diameter than the coin required. On this he hollows out the exact form of the desired impression by cutting out the exact form of the deared impression by dutting away the steel by degrees, with small, well-tempered, case-hardened tools. As soon as this is done, the steel is hardened by being heated red-bot in a crucible with charcoal and oil, or bone-dust (see CASE-HARDEN-ING), and then plunged into cold water. When a great number of coins of one sort are required, the original examples which it gives of the uses of the words, and generally useful dictionary is that by Dr. N. Webster, of America, which has several times been reprinted in this country. Based upon it is the "Imperial Dictionary," by Dr. John Oglivie, which is a very useful and tolerably complete and accurate work. Walker's "Critical Pronouncing in the words. Walker's "Critical Pronouncing in the correct produced by the pronouncing in the first produced by being heated red-bot in a cruoble with charcoal and oil, or bone-dust (see Case-narden in the country). Based upon it is the "Imperial Dictionary," by Dr. John Oglivie, which is and accurate work. Walker's "Critical Pronouncing in relief, and is called the puncheon, and from which, when it has been hardened, other dies are produced by pressure exactly similar to the matrix, and in integlio,

#### Dies Ire

which are case-hardened in their turn before they are fit to transmit an impression to any metal used for money. The metal used for our coinage, whether gold, silver, copper, or bronze, is stamped in a cold and solid state; but medals and casts can also be produced by a method called casting ex clické, in which the metal is used in a solf state, and an impression may be obtained even from dies of wood or plaster. For this process an alloy is used, consisting of \$1 lead, \$1 tin, and \$5 bismuth, which fuses readily at the boiling-point, 212° Fahrenheit. When the metal is still soft, resembling paste in consistency, the die is placed unon it. and the paste in consistency, the die is placed upon it, and the impression produced by a smart blow from a mallet. The surface of the metal sets instantly, from coming into contact with that of the cold die, and thus readily retains the form that has been given to it. Copies of medals may be readily made in this way; but each medals may be readily made in this way; but each fince will be obtained in a separate piece, and these must be joined to give a representation of the coin in a complete form. A quantity of ornamental-work is produced in thin metal for gas-fittings, cornices, parts of cruet-stands, trays, &c., by means of a pair of dies, on one of which the pattern is formed in relief, and on the other in intaglio, the metal being placed between them, and brought into the desired shape by pressure. Dies are also made in metal for forming articles in gutta-percha and leather, and producing embossed figures on the cloth covers of books, as well as on cardboard, paper, &c.

DIES IER, di'es i'-re (Lat., day of wrath), is the name commonly given, from the opening words, to a celebrated Latin hymn, describing the final judgment of the world. It is characterized by remarkable force and beauty, combined with great smoothness of phyme,

and commences :-

Dies iræ, dies illa, Solvet sæelum in favilla, Teste David cum Sibvlla.

Quantus tremor est futurus. Quando Judex est venturus, Cuncta stricte discussurus!

Tuba mirum spargens sonum Per sepulchra regionum, Coget omnes aute thronum.

The authorship of this beautiful hymn has been ascribed to various persons; but it most probably proceeded from the pen of Thomas of Celano, a Franciscan monk, who died about the year 1255. In the 14th century it was admitted into the service of the Church, and made a part of the Requiem, or mass for the souls of the dead. Several alterations were then made in the text; but that is believed to be the original reading which is found engraved on a marble tablet in the church of St. Francis at Mantus. This hymn has been frequently translated into German, and has been done into English

translated into German, and has been done into English by Lord Macanlay, Lord Lindsay, and others.

Dier, di-et (Ger. reichtlag, Du. ryksdag, Dan. rigsdag), is derived from the Latin dies, 'a day,' and is properly the day of the empire. It is applied to the principal national assembly of various countries of Europe. Under the old German empire, the emperor summoned annually two regular diets, which met usually at Ratisbon, besides extraordinary ones on special any at hatsoon, besides extraordinary ones on special occasions. The emperor and the diet exercised all the prerogatives of sovereignty, levying taxes, enacting laws, declaring war, and making peace. The diet was composed of three chambers:—1. The chamber of Electors; 2, that of the Princes, which was divided the contractions of the princes, which was divided into two sections,—the spiritual and temporal,—the former being subdivided into the Swabian and Rhenish benches, each of which had one vote, and the latter into the Wetteravian, Swabian, Franconian, and Westphalian benches, each of which had also one vote; 3. the chamber of the Imperial Cities, divided into the Rhenish and Swabian benches. Each of the chambers Idensish and Swadian Denoices. Each of the chambers deliberated separately; but then the two first met together, and decided definitively on any proposition, which, when ratified by the emperor, became a decree of the empire. The emperor could refuse his ratification, but could not modify she decisions of the diet. The diet of the modern Germanic confederation is a meeting of plenipotentiaries, which is permanent, and assembles in the free city of Frankfort-on-the-

## Dietary, Military and Naval

Maine. The diet is constituted in two forms;—1. as a general assembly, called *Plenum*; and 2. as a minor council. The Plenum meets only when some organic change is to be introduced, or any affair relating to the whole confederation to be decided. Every member of the confederation has at least one vote, and several of the larger powers, as Austria and Prussia, have four; the larger powers, as Austria and Prussia, have four; making in all seventy votes. In making or altering fundamental laws, unanimity is required; but in other cases matters are decided by two-thirds of the number of votes. In the ordinary or federative diet, there are only seventeen votes, of which the eleven, principal states have one each, and the remaining twenty-seven only six among them. It brings forward and discusses propositions which are to be presented to the Plenum, where they are not debated, but simply decided by votes. It also executes the enactments of the Plenum, and disnatches the current husiness of the plenum, and disnatches the current husiness of the confederavotes. It also executes the enactments of the Figure and dispatches the current business of the confederation. It decides by a simple majority, and soven votes form a quorum. Austria presides in both diets, and has the casting vote in the smaller assembly. The deputies have the character of plenipotentiaries, are responsible only to their respective governments, and must therefore act according to the instructions of their own courts, and not after their own convictions. The diet of Hungary is composed of the king (the emperor of Austria) and the estates, the latter being divided into two chambers,—an upper and a lower. They consist of the higher clergy, the magnates, the two courts of appeal, and two representatives from each chapter, county, city, and privileged district. The diet of Switzerland is composed of the representatives of the cautons, and is held every two years, alternately at Zurich, Berne, and Lucerne. It manages such affairs of the constitution as are not within the jurisdiction of any of the separate states. Each canton has a vote in the diet.

DIETARY, MUITARY AND NAVAL, di-et-a-re (from r. diaita, manner of living), that which pertains to Gr. diaita, the prescribed rules for feeding among soldiers and sailors. In the British army the dietary is under the control of the commissariat department. During the Crimean war the necessity of reform in the distribution of food and daily necessaries became too painfully apparent. Since that time the whole arrangements have been put on a new footing. The commissariat is now a War-office depurtment, under a commissariat is now in chief. The cooking of provisions has also since that time become a commissary generaltime become a very important feature in the English military system. It was too palpably shown that military system. It was too palpably shown that cookery was but little understood by the British soldiers. Government sent out M. Soyer principally the principally the principally the principal to be principally the princi to give advice in regard to hospital cookery, and also to superintend the general military dietary. A com-mittee was appointed a few years ago to consider the subject of barrack economy, and they recommended that every large barrack should have a bakery with two ovens, where the men could learn to bake and make their own bread. They also advised that arrangements should be made by which the men might be enabled to bake their own meat, instead of eating it always boiled. Gradually these recommendations are being acted upon, and nearly all large burracks are provided with new and carefully-arranged stoves. The cooking arrangements at the new barracks at Aldershot are superior to any yet used in the English army. (See COMMISSABLAT, RATION.) In naval dietary two circumstances are taken into account in supplying provisions to ships in the royal navy ;--first, the ration or established allowance of certain articles; and second, the average ex-perience of the past with regard to others. Under the first head all rations are equal, from the first officer to the ordinary seaman; under the second head there are the ordinary seaman; under the second head there are wide differences: thus, fresh ment, preserved meat, lemon-juice, wine, &c., are considered as non-guaranteed by the crew, and can he given or withheld, as circumstances may occur. Naval dictary has changed from time to time in relation to the kind and quality of food supplied. The daily ration in 1844 was as follows:—biscuit 1 lb., salt neat \$1 lb., vegetables \$1 lb., sugar 1\frac{1}{2} oz., rum \$\frac{1}{2} \text{pint.} A small quantity of oatmeat and vinegar were also allowed every week. The cost of the naval dictary in 1844 was about £18 per man per annum. In 1847 tea and sugar were first introduced into the sailor's dietain lieu of rum; government has,

#### Dietetics

however, never tried to force the temperance system on the navy. In 1859 the dietary was made more liberal by the Admiralty, in order to increase the attractiveness of the navy; no country is now so liberal in its naval dietary as England. The dietary in emigrant ships is regulated by law, every ship being bound to possess certain kinds and quantities of provisions, according to the number of the passengers and the length of the voyage.

Dieterios, diet-et-iks (Gr. diaitetike), is that department of medical science which relates to the diet or ordinary food. (See Food.)

partment of medical science which relates to the diet or ordinary food. (See Food).

DIEU IT MON DROIT, dyu(r) ai mawn(g) drwaw (Fr., God and my right), the motto of the royal arms of England, first assumed by Richard I., to intimate that he held his sovereignty from God alone, and not in reassalage to any man. It seems to have subsequently been dropped, but was afterwards assumed by Edward III and was continued (except during the reign of III., and was continued (except during the reign of Elizabeth), without interruption, to the time of William III., who used the motto Je maintiendray, though the former was still retained upon the great seal. After him, Queen Anne used the motto Semper eadem, which had been used before by Elizabeth; but, since the time of Queen Anne, Dien et mon droit has continued to be the royal motto.

DIFFRENCE, dif'-fer-ens (Lat. differre, to carry from each other), in Log., is one of the predicables, and denotes that particular quality which distinguishes the subject under contemplation from all others, when looked at from the point of view in which we are regarding it. Logically, it is said to express the formal or distinguishing part of the essence of a species,—that which distinguishes it from every other species contained under the same genus. The having only three sides is the difference or distinguishing feature which separates triangles from squares, polygons, and every other species of figure contained under the common

genus rectilineal.

DIFFERENCES.—In Her., there are marks of differences of two classes; the former of which is used to distinguish different branches of the same family from each other and from the chief of the family, when the original bearer of the coat is dead; and the latter to distinguish the coat-armour of sons from the paternal cost, while the father is still alive. Marks of difference, properly so called, belonging to the first class, consist of the addition of a chief or border to the original cost; the eldest son bearing the paternal coat without any addition; the second son, the paternal coat within a plain border; the third bearing it within a border engrailed; the fourth, with a border invected; the fifth, within a border wavy, &c. Sometimes differences have been shown by assuming borders of different nave been snown by assuming orders of underent tinctures or metals, or by altering the colours and metals of the field and charges of the coat. Differences of the second class, properly called marks of cadency, consist of the addition of a certain figure to the paternal coat for each of the sons; these figures con-sisting of a label of three points for the eldest son, a crescent for the second, a mullet for the third, a martlet for the fourth, an annulet for the fifth, a flaux-do. is for the sixth a rose for the seventh a cross fleur-de-lis for the sixth, a rose for the seventh, a cross moline for the eighth, and a double quatrefoil for the ninth. When the father is dead, the marks of cadency ninth. When the father is dead, the marks or causing should be erased and the border substituted, as mentioned above. The princes of the blood royal bear the label only on the royal arms, and are distinguished by

label only on the royal arms, and are distinguished by bearing various emblems on the points of the label. The prince of Wales, however, bears a label argent simply, without any distinctive mark on the points. DIFFREENTIAL CALCULUS, dif-fer-en-shid (Lat. dif-fero, I move apart), a term applied to one of the most important branches of the higher mathematics. The object of the differential calculus is to find the ratios of the differences of variable magnitudes, on the supposition that these differences become infinitely small. In this study it is necessary to pay particular attention to the meaning of the terms infinitely and infinitely small. All magnitudes in mathematical reasoning are considered to be capable of augmentation and diminu-tion without limit. A quantity, therefore, can be conceived to be so great as to exceed any finite quantity fully conveyed to the bottom of the vessel, it will be of its own nature, or so small as to be less. In the found that, after the lapse of a few days, the wine will first case it is said to be infinite, and in the latter gradually diffuse itself into the water and the water

# Diffusion of Liquids

These magnitudes are of course infinitely small, imaginary, as in both cases quantities may be conceived either greater or smaller; so that an infinitely large quantity may be considered as nothing, or zero, and quantity may be considered as account, of serio, sun an infinitely small quantity as the same, when compared with one another. In the differential calculus, the infinitely small quantities which come under consideration are called differentials. The differential of a magnitude, or variable function, as it is called, is emiginitude, or variable induction, as it is called, is expressed by placing the letter d before the magnitude or function. Thus dx signifies the differential of the variable magnitude x. Formerly it was the custom to put a dot over the fluxion of a quantity, as it was then called. Thus x represented the fluxion of x. The use of the letter d was introduced by I calling when of the letter d was introduced by Leibnitz, who, con-temporary with Sir Isaac Newton, gave much attention to the subject. These two philosophers, independently of one another, studied the science of the differential calculus at the same time; but of late years the method of Leibnitz has almost exclusively prevailed, to the exclusion of the name, notation, and method of

Newton's fluxions, in such points as they differ.

DIFFRACTION OF THE RAYS OF LIGHT, dif-frak-shun (Lat. difractum), in Optics, the modification which light undergoes in passing very near the edges of any opaque body. It was first observed by Grimaldi, who noticed that when a ray of light was allowed to enter noticed that when a ray of light was allowed to enter a dark reom, the shadows cast from any opaque body were larger than if the light passed by it in straight lines, and that those shadows have three bands of coloured light parallel with them. At first this phenomenon was attributed to the refracting power of the atmosphere; but this theory was disproved by Newton, who treats of the subject in the last book of his Optics. He endeavoured to explain its occurrence through the general properties of light. It is now looked upon as identical with many phenomena connected with the undulatory theory of light, and is assigned to the inter-

ference of undulations.

DIFFUSION OF GASES, dif-fu'-thun (from Lat. dif-fundo, I pour ont hither and thither), in Chem.—If two vessels be filled with two different gases, and connected by a tube, it will be found that, after a certain lapse of time, an intimate and equal intermixture of then will take place. If, however, means be taken to measure the velocity with which they mix, it will be found that the lighter of the two diffuses itself much more rapidly into the heater than vice versa. This velocity of diffusion may be measured in the following manner:—If a glass tube, closed at one end with a porous plug of plaster of Paris, is filled with hydrogen, and plunged mouth downwards, the hydrogen will gradually press through the porous disphragm into the air, and the air will gradually supply its place. But it will be found that the hydrogen diffuses itself into the air much more rapidly than the air into it, causing the water to rise in the tube, contrary to the action of gravity. Mr. Graham and others, by a similar apparatus, have determined the exact rates of diffusion of all gases, which appear to be in accordance with a law that the relative diffusiveness of gases is unity divided by the square root of their density, taking air as the standard. The following are the velocities of diffusion of some of the more familiar gases:—

Hydrogen	3.83
Carburetted hydrogen	1 34
Oleflant gas	
Air	
Carbonic acid	0.81
Sulphurous acid	0.68

Diffusion of gases is a process that is continually going on around us. Were it not for this property, gases deleterious to animal and vegetable life would be constantly accumulating in poisonous masses, instead of being silently and harmlessly distributed through the atmosphere.—Ref. Graham's Philosophical Magazine,

DIFFUSION OF LIQUIDS, in Chem.—Liquids of different densities, like gases, gradually diffuse into each other when brought into contact. Thus, if a salt-jar be filled with water, and ryd wine be gradually and carefully conveyed to the bottom of the vessel, it will be

Digamma

into the wine, until the whole is uniformly mixed. By means of an apparatus of this kind Mr. Graham was enabled to calculate the different velocities of a large number of substances. These velocities vary in the most remarkable manner, sulphuric acid, for instance, diffusing into water with twenty-four times the velocity of albumen. Pursuing these experiments, Mr. Graham was at last able to classify all soluble substances with the velocities and in doing to the contract of the velocities and in doing to the contract of the velocities and in doing to the velocities and in doing the velocities and in the velocities are velocities and the velocities and the velocities are velocities and velocities are velocities are velocities and velocities are v stances according to their velocities, and in doing so stances according to their venerities, and in doing so he made the marvellous discovery that a disphragm covered with alayer of a solution of low velocity totally interrupted the passage of a solution of still lower power of diffusion through its mass. Carrying these ideas further, he has classified all soluble substances ander two heads,—colloids, or amorphous substances, similar to gelatine, which he takes as the substances, similar to gelatine, which he takes as the substances taking a crystalline form, and having a high diffusive velocity. These two classes seem to be divided naturally by other characteristics than velocity of diffusion. All crystallides were not not provided white called the characteristics than velocity of diffusion. onaracteristics than velocity of diffusion. All orystati-loids are more or less rapid, while colloids, such as starch, dextrin, albumen, &c., are insipid, and soluble with difficulty. Colloids offer but little resistance to the diffusion of crystalloids through their mass, while they are in a manner impervious to substances of their own class. On this property Mr. Graham has founded his system of dialysis, or the separation of the crystal-loid and colloid constituents of a liquid by the inter-vention of a colloid septum. (See Dialysis). Ano-ther curious property of colloids is their power of re-maining in solution until some disturbing influence suddenly reduces them to what Mr. Graham calls their pectous state. For instance, solution of ulmic acid may be preserved perfectly liquid for weeks in a scaled tube, but it is sure to become gelatinbus, and insoluble at last. The late discoveries of Mr. Graham in the crystalloid and colloid conditions of matter may be reckoned as amongst the most valuable of the day, and will increase the lustre of an already brilliant re The following table will give an idea of the relative diffusibility of crystalloids and colloids :-

Albumen .....49 Colloids. Caramel ......58.

(For a full account of Graham's experiments on diffu-

rot s tan account to grant the printers of this soon of liquids, see a paper by him in Philosophical Transactions for 1862, part I.)

DIGAMMA, di-gami-mā (Gr. dis, twice, and gamma, the letter gamma), was the name given to an old letter of the Greek alphabet, from its having the form of two gammas act one over the other, and resembling our F. It appears to have occupied the sixth place in . It appears to have occupied the sixth place in that alphabet, and to have had the sound of v. Much discussion, however, has been carried on regarding the nature and pronunciation of this letter, upon which we cannot enter, but must refer the curious to Kidd's cedition of Dawes Mincellanea Critica, and Ahren's De Graca Lingua Dialectis. The use of the digamma was most common in the Æolio dialect; but even from

was most common in the Asolic dislect; but even from this it disappeared at a very early period.

DIGEST, di'-jest' (Lat. digestus, put in order), is a name often applied to the Paudects of the civil or Roman law. It was compiled from the works of previous Roman jurists by Tribonian and others, at the command of the emperor Justinian, and was published

DIGESTER, di-jes'-ter (from Lat. digero, I distribute, dissolve), a strong iron or copper vessel, with a steamtight lid, furnished with a safety-valve, in which water and other fluids can be heated beyond their boilingpoints. This form of apparatus was first invented by Papin, and is in consequence frequently called Papin's digester.

DIGESTION, di-jest-tshun (Lat. digestio, from digero, I carry to different parts, or dissolve), in Physiol., is that process by which the food of animals is converted into chyme in the stomach, and prepared for being ultimately taken into the blood. The function or process of digestion is one of the principal of those that are directly concerned in the maintenance of life: and hence its proper performance is of the utmost importance to the individual; while depending, as it Digging

does, upon the healthy condition of a great number of organs, it is not to be wondered at that it is liable to disorders, and is productive of an endless variety of diseases under the general term indigestion. diseases under the general term indigestion. The principal processes connected with digestion are usually represented as,—(1) Mastication; (2) insalivation; (3) deglutition; (4) clymification, or the action of the stomach; (5) chylification, or the action of the intestines; (6) defæcation; and (7) the absorption of the chyle. The operation of mastication is a very important auxiliary to digestion; since the more the food is broken down and mixed with the saliva the more readily and completely will it be acted upon by the stomach. Imperfect mustication is a frequent cause of indigestion. During this process the salivary glands yield up their contents, by means of which the dry food is moistened and rendered more fit for deglutition. The third process is the act by which the food is transferred from the mouth to the stomach. (See DEGLUTITION.) The alimentary matter being propelled by the contractions of the osophagus into the cardiac extremity of the stomach, is there acted upon carriac extremity or the stomach, is there acted upon and dissolved by the gastric juice, which is secreted by glands lying in its inner or nucous coat. This process is assisted by the muscular contractions of the stomach, by means of which the mass is kept in motion until it is formed into chyme. When it has been sufficiently operated upon it operated upon, it passes through the pyloric opening into the duodenum. The pylorus possesses a peculiar sensibility, that prevents any matter from passing through it but such as has been properly converted into chyme. Recent investigations have shown that the changes which the food undergoes in the stomach are essentially chemical. (See Gastric Jutor.) The process of gastric digestion is very slow. It is more than an hour before the food suffers any apparent change; and the ordinary time required for the diges-tion of animal food is from three to four hours. The tion of animal rood is from three to four nours. The chyme having passed through the pylorus into the duodenum, becomes mixed with the biliary, pancreatic, and intestinal secretions. These juices, by their action upon the chyme, separate it into two portions,— one smilky fluid called chyle, the other the excrementatious portion. The bile seems to be of use principally in promoting the digestion of fatty matters, while the pancreatic juice serves mainly to convert starchy matters into sugar. Of the use of the intestinal juice ittle is known. The chyle attaches itself to those irregular circular folds of the mucous membrane of the small intestines, called the valvulæ conniventes, where it is absorbed by the lacteals. The large intestines also possess lacteals; so that, if any portion of the chyle should not have been absorbed in the small intestines, it is taken up in the large ones. pass gradually from the small to the great intestines, until they reach the rectum, where they are retained for some time and then discharged. The absorption of the chyle forms the last act in the process of digestion. It is, as we have already seen, taken up by the lacteals, and is by them conveyed to the mesenteric glands, where it is supposed to undergo some change. From thence it makes its way to the right side of the aorta, in the lumbar region, where it is finally discharged into an elongated pouch, called the receptaculum chylic From this pouch the thoracic duct conceys the chyle upwards to the left side of the neck, where it is poured into the left subclavian vein at its junction with the internal jugular, and, being thus mixed with venous blood, it is carried to the lungs and there converted into new and perfect arterial blood.

DIGESTION, in Chem., is heating a substance in a liquid, in order to extract some principle contained in it. It is distinguished from maceration by being

performed at a high temperature.

DIGESTIVE, di-jest'-iv, in Surg., is a term applied to such applications, ointments, poultices, and the like, as promote, or are believed to promote, healing or suppuration, when applied to a wound or ulcer. Though puration, when applied to a wound or ulcer. common formerly, the term is now little used.

DIGGING, dig-giag (Ang.-Sax.), the operation of moving, or stirring, or breaking up earth with a spade, pickare, or other sharp instrument. It is mostly performed in gardening, but in some situations, where the size of the inclosures is small, or where the power is insufficient for the cavy working of the

Dilatory

common or the subsoil, plough, cultivators prefer manual labour with the spade. Experience, too, has proved that the expense of deep-digging, or spade-busbandry, is not materially different from that of the subsoil plough. In gardening, the chief use in digging is to mix the soil by burying the surface and bringing what is below to the top. In private gardens digging is often much neglected; but commercial growers, who have to make the most of their ground, pay particular attention to the subject, and the result is seen in their superior productions. In ordinary digging, the spades used in the market gardens round London are 134 fitches long and 10 inches broad. Those used in private gardens are smaller,—Ref. Johnson's Furmers' private gardens are smaller .- Ref. Johnson's Furmers'

Encyclopedia.

Dierr, di'-jit (Lat. digitus, finger), a finger; a term employed in Arith. to denote one of the ten symbols or figures, 0, 1, 2, 3, &c. According to the original acceptation of the term, the first ten figures of any row were digits, but now, by common acceptation, the term is employed to denote the first ten figures used in the common acceptation, the term is employed to denote the first ten figures used in eckoning number; thus, 20 is a number of two digits. By astronomers the term digit is used to signify the twelfth part of the diameter of the sun or moon; thus, in speaking of eclipses, they say that it was of

seven or eight digits.

EXBECISES, dij'-it-al eks'-er-si-zes (Lat. DIGITAL digitus, a finger; Fr. exercice), in Practical Mus., are exercises employed for the purpose of rendering the fingers independent of each other. As the third finger is the weakest, it is very necessary for all who practise the pianoforte, &c., to cultivate its volition, and strengthen it by exercises adapted for that purpose.

Desiralis, dij-dt-dt-dts (Lat. digitus, s finger), in

Desiralis, dij-d-ai-dis (Lat. digidus, a finger), in Bot., a gen. of plants belonging to the nat. ord. Scrophulariacea. The most important species is D. purpurea, the purple foxglove, one of the handsomest of our indigenous plants. It is a biennial, blossoming during the months of June and July, and is found on hedge-banks and/the sides of hills, in dry, gravelly, or sandy soil. The flowers are somewhat bell-shaped, and their remote resemblance to the fingers of a glove suggested the generic name. They are beautifully marked on the inside with purple blotches. The foxglove sometimes grows to a great height: one specimen rathered times grows to a great height; one specimen gathered near Tintern Abbey, measured 7 ft. 9 in., the spike of flowers was 4ft. 10 in. in length, and the number of flowers thereon 311. A variety commonly met with in gardens has white flowers epotted with different shades of cream-colour and pearl. The wild foxglove is a most important medicinal plant. The leaves only are officinal in our pharmacopesias; but the seeds and roots pos in our pharmacopenas; but the secus and roots pos-sess similar properties. Digitalis is a duretic, and greatly resembles tobacco in many of its properties. It is employed to reduce the action of the heart in diseases of that organ, in fever, and in inflammations. It is prescribed as a diuretic in dropsies of all kinds, but is most useful in those associated with a debilitated and generally diseased state of the constitution. It is a violent poison, and great care is requisite in pre-scribing it, as its use, even in small doses, has led to fatal results: for it accumulates in the system. active principle of forglove is termed digitaline.

DIGITIGRADA, dij'.pit-e-prai'.da (Lat. dijitus, a finger; gradior, I walk), in Cuvier's zoological system, a tribe of carnivorous animals distinguished by walking upon the toes, the heel being always raised from the ground. Those animals which place the heel or the sole of the foot on the ground belong to the tribe Plantigrada. Some of the most carnivorous mammalia belong to the digitigrada. The feline and canine fami-

belong to the digingrada. The leads and canno namines, hymnes, civets, &c., are all included in it. The Wessel fam. (Mustelidæ) appears to form a connecting fink between the digitigrada and the plantigrada.

DIGNITAEN, digi-ne-tā-re (Lat. dignas, worthy), in coclesiastical matters is one who holds cathedral or other preferment, to which jurisdiction is annexed, which is a consequence over more private of giving him some pre-eminence over mere priests or canons. The dignitaries in English cathedrals are, for the most part, the dean, precentor, chancellor, treasurer, and archdeacon; but in cathedrals of the new

surer, and arendeacon; but in enthedrais of the new foundation, the only dignitary is the dean.

Dignira, dig-no-te (Lat. dignus), denotes nobleness, or elevation of mind, consisting in a high sense of justice, truth, and propriety, with an abhorrence of all

mean and sinful acts. It is also applied to the titles of honour and authority among men; and these, in this country, are usually divided into superior and inferior, the former comprehending dukes, marquises, and the like; the latter, baronets, knights, &c. They were originally annexed to the possession of certain estates in land, and created by a grant of these estates; and although they have now become little more than personal distinctions, they are still classed under the head of real property. Having thus, in theory at least, re-lation to land, they may be entailed by the crown within the statute De Donis. No temporal dignity of any foreign nation can give a man a higher title than that of esquire. Dignity, in Oratory, is one of the three parts of elecution; consisting in the right use of tropes and floures.

and ngures.
DIGBAPH, di'-gröf (Gr. dis, twice, and graphe, I write), in Gram, is a union of two vowels of which only one is sounded; as in head, breath. It differs from a diphthong, which also consists of two vowels, in the sound produced in the latter case being different from the of cibles of the graph to the grant that from that of either of the vowels taken separately.

Dioression, di-gres'-shun (Lat. digressio), denotes literally a stepping out of the way or road; and hence, in literature, a departure or wandering from the main subject under consideration. Digressions may some-times be introduced with great effect; but they ought not to be had recourse to without sufficient reason, and should never be too frequent nor too long. Frequent digressions are a sure mark of an unskilful speaker or writer. Where a subject is heavy and dry, an occasional digression may serve to relieve the at-tention, and throw additional light upon it.

DIKE. (See DYKE.)

DILAPIDATION, dil-ap'-e-dai'-shun (Lat. di, and lapis, a stone), in ecclesiastical matters, is the suffering the edifices of a benefice to go to decay, and neglecting to repair them, and is also applied to the committing, or suffering to be committed, any wilful waste upon the glebe, woods, or other inheritance of the church. Dilapidations are therefore either permissive (arising from neglect) or voluntary (occasioned by some wilful act). By the Injunctions of Edward VI., it is required that the proprietors, parsons, vicars, and clerks, having churches, chapels, or mansions, shall yearly bestow upon the same mansions or chancels of their churches, upon the same mansions or chancels of their churchers, being in decay, the fifth part of their benefices till they be fully repaired; and the same being thus repaired, they shall always keep and maintain in good estate; for the revenue of the clergy is given not only as a provision for the clergyman, but also for his suitable residence. Dilapidations may be sued for in the spiritual courts; but it is most usual to do so by action at common law. The action may be brought by the successor against the predecessor, if living; or, if dead, against his executors; and against an alienee, if made over to him to defeat the remedy for dilapidations.

DILARATION, dil-a-tai-shun (Lat. dilatatio), is the expansion or enlarging of bodies after a state of contraction or compression. It differs from extension, as the latter is properly applied only to lines and surfaces, the former to bodies that spread open or enlarge in all directions.

DILATORY, dil'-a-tor-e (Lat. dilatio), denotes literally a delaying or putting off, and is applied, in Law, to certain pleas which are put in merely to delay the suit by questioning the propriety of the proceeding rather than by denving the injury. They are either pleus to the jurisdiction, showing that by reason of some matter there is stated, the case is not within the jurisdiction of the court; or pleas in suspension, showing some tion of the court; or pleas in suspension, showing some matter of temporary incapacity to proceed with the suit; or pleas in abutement, showing some matter for abatement, or quashing the declaration. These pleas must be verified by alfidavit, or evidence produced in the court to induce a belief in their truth; and in general they are not allowable after a plea in bar. The effect of a dilatory plea is that, if successful, it defeats the particular action, leaving the plaintiff at liberty to commence another in a better form, if the cases should be such as to admit of an amendment of cuse should be such as to admit of an amendment of that description. In criminal cases, a plea in abatement, or dilatory plea, is founded on some matter of fact extraneous to the indictment, tending to show that it is defective in point of form.

#### Dilemma

DILEMMA, dil-em'-ma (Gr. dis, twice, and lemma, an assumption,—a twofold assumption), in Log., is a species of argument in the form of a complex conditional syllogism. It is defined to be a redundant hypothetic syllogism, in which the hypothetical premiss consists of an antecedent or condition dependent on the several members of a distributive or disjunctive consequent. This argument was called by the Romans to Syllogismus corrupts. Whence our phrase of the Syllogismus cornutus; whence our phrase of placing one on or between the horns of a dilemma." It is used to prove the absurdity or falsehood of some assertion. A dilemma must be so framed that one of the alternatives must be admitted; and each alterna-tive must exactly apply. It ought also to be incapable of being retorted. When an affirmative is proved, the argument is said to be constructive; when a negative, it is called destructive. Of the constructive dilemma it is called destructive. Of the constitueive diaminisher or two sorts,—the simple, which concludes categorically, and the complex, which has a disjunctive conclusion. There is only one kind of destructive dilemma. The Greek dialecticians prided themselves on exhibiting dilemmas which they alleged to be insoluble. Some of these examples were constructed with great dexterify, and the discovery of the fallacy is by no means easy. One of the most famous of them, known as the "sophism of Euathlus," is as follows:—Euathlus had received lessons from Protagoras the rhetorician, on condition that the fee should be paid when the pupil gained his first cause. Euathlus delaying to undertake any cause, Protagoras sues him, and argues in this way: "If I am successful, you must pay me in virtue of the sentence; if unsuccessful, you mist pay me in terms of our agreement, as then you will have gained your first cause." The pupil retorts: "If I am successful, I am free by the sentence; if unsuccessful, I am free by the agreement."

DILETTANTE, dil-e-tan'-te (Ital., pl. dilettanti), is an admirer or lover of the fine arts, and is sometimes applied, by way of reproach, to one whose knowledge is mere affectation or pretence.

DILETTANTI SOCIETY, is a society of noblemen and gentlemen, formed in London in the earlier half of last century, and which has done much to foster the study of antique art in England. In 1764 it fitted out an expedition to Greece, for the purpose of collecting details and drawings of sacient monuments, the result of which was published under the title of "Ionian Antiquities," in 1769. They have since fitted "Jonan Antiquities," in 1769. They have since intead out several other expeditions, and given their results to the world in the same way. They have also issued "Specimens of Ancient Sculpture,—Egyptian, Etruscan, Groek, and Roman," selected from different collections in Great Britain, in 2 vols., London, 1809-35. The last work published by them is entitled, "Portfolio of Grock Architecture, or Drawing-book of Dilettanti,"

DILIGENCE, dil'-e-jens (Lat. diligentia, from diligo, I love carnestly), denotes generally a steady applica-tion of the mind or body to business of any kind; also tion of the mind or body to business of any kind; also care, attention, heedfulness. The law recognizes only three kinds of diligence,—(1) Common or ordinary diligence, which men in general exert with regard to their own concerns; (2) extraordinary diligence, or that care which very prudent persons take of their own affairs; and (3) low or slight diligence, such as persons of little or no prudence take of their own matters. In the law of Scotland diligence is also applied to the variant issued by the courts for accounting the to the warrants issued by the courts for enforcing the attendance of witnesses, or compelling the production It also denotes that process of law by which a creditor attaches the person, lands, or effects of his debtor, either on execution or in security for his debt. Dilizences are either real or personal,—real when applicable to real or heritable rights, and personal when for the purpose of securing the person of the

when for the purpose of securing the person of the debtor or his personal estate.

DILICENCE (Fr.), a heavy French travelling-coach, drawn by four horses. Before the introduction of railways, the diligence was much used in all parts of France. It is divided into three compartments,—the coupé, or front, holding three travellers; the intérieur, holding six; and the rotonde, entered from behind, holding eight. The driver's high seat in front is called the banquotte; and the rest of the passengers are huddled indiscriminately among the lugrage or under huddled indiscriminately among the luggage or under

### Diminutive

the tarpaulin which covers it. In general, a diligence weighs about five tons, and goes at the rate of six miles an hour.

DILL. (See ANETRUM.)

DILL. (See ANETRUM.)
DILLLENIACEE, dil-lene-ad'-sees (after the botanist Dillenius), in Bot., the Dillenius fam., a nat. ord. of dicotyledonous plants, in the sub-class Thalamillore, consisting of trees, shrubs, and a few herbs, having the following marks of distinction:—Leaves usually alternate, and, except in rare cases, without stipules: sepals and potals, five of each, hypogynous, the former persistent in two rows, the latter with an imbricated astivation: carpels more or less distinct; seeds arilestivation; carpels more or less distinct; seeds aril-late; albumen fleshy, homogeneous. The order inlate; albumen fleshy, homogeneous. The order in-cludes between 20 and 30 genera, and about 200 known cludes between 20 and 30 genera, and about 200 known species, occurring chiefly in Australia, India, and equinoctial America. They have astringent properties, and many are used for tanning and as vulneraries. The young calyces of some species of the typical genus Dillenia have an acid taste, and are employed to flavour curries in some parts of India. Many species of this genus grow to a large size, and form hard durable timber. Those of India are generally remarkable for fine evergreen foliage and very beautiful flowers. They are sometimes cultivated as stove or greenhouse plants are sometimes cultivated as stove or greenhouse plants

in this country.

DILLESK. (See RHODOMENIA.)

DILUENTS, dil'-u-ents (Lat. dilno, I wash away). Med., are liquids administered to increase the fluidity of the blood, and render certain of the secretions and exerctions less viscid. They likewise promote the operation of more active medicines, especially ape-rients and directics. Water is the simplest and frequently the best diluent; or it may be made more agreeable by the addition of acid or other substances, or is the form of tosst-and water. Gruel, infusion of tea, mutton and chicken broth, beef-tea, and such-like, come under this designation. Diluents are of great use in allaying the thirst of patients affected with fover or other inflammatory complaints, and are often very useful in subduing the more violent symptoms of the disease, and relieving the system by means of perspiration. The excessive use of fluids at meals, however, is hurtful to digestion.

DILUVIUM, di-lu'-re-um (Lat. die, asunder; luere, to wash), in Geol., a term applied to accumulations of gravel, sand, or stones, which are referred to the extraordinary action of water, the term alluvium implying the ordinary operations of water. At one time geologists merely used the word diluvium to distinguish accumulations supposed to have been formed during the Noschian deluge; but we now employ it as a common name for all masses which have apparently been pro-

duced by powerful aqueous agency.

DIMENSION, dim'-en-shun (Lat. dimensio), in Geom., signifies the extent of anything. A line, whether straight or curved, has only one dimension,—length; a surface has two dimensions,—length and breadth; while a solid has three,—length, breadth, and thickness. All forms of extension can be determined by these three dimensions. In Alg., the term dimension is applied to the number of true factors to a term, and is used very much in the same sense as degree; thus, x², xy, are of two dimensions; x², x²y, xyz, &c., are of three dimensions. An equation is generally said to be of as many dimensions as there are units in the index of the

highest power of the unknown quantity.

DIMINISHED, dim-in'-ishd (from Lat. di, and minuo, I make less). - In Mus., when an interval, by the application of a sharp or natural to the lower tone, or of a flat or natural to the upper, becomes contracted within its natural space or compass, it is said to be diminished: thus, by raising a minor seventh a minor semitone higher, a diminished seventh is produced. DIMINUTION, dimini-u'-shun (Lat. diminutio).—This term in Mus. implies the imitation of, or reply to, any given subject in rota of helf the leavel or value of

given subject in notes of half the length or value of those of the subject itself. For instance, a theme ex-pressed in minims and crotchets, and taken up in crotchets and quavers, would be said to be answered in diminution.

DIMINITIVE, dim-in'-z-tiv (Lat. diminutioum, from diminuo, I lessen), in Gram., is applied to a word whose signification is lessened or diminished by some change effected upon its form. Though diminutives are chiefly

#### Dimissory Letters

confined to substantives, yet we occasionally find them among adjectives, pronouns, and even verbs. The diminutive does not always express littleness or smalldiminutive does not always express littleness or small-ness, but sometimes, also, tenderness, affection, con-tempt, &c. They are usually formed by the addition of a syllable sit the end of a word. There is, perhaps, no language without diminutives; certainly, they are very common in most. Generally, they will be found to be most common in the language of a people of lively and affectionate manners, and prevail most in the friendly and familiar intercourse of the common people. The Italian language, particularly the Tuscan dialect, is especially rich in diminutives. The Spanish, Portraguese. French, and German languages likewise Portuguese, French, and German languages likewise abound with them. The old Scotch dialect is very rich in diminuitives, and there we sometimes find, as in the Italian, double diminutives; as, horsie, a little horse;

horsikie, a very little horse.

DIMISSONY LETTENS, dim'-is-sur-re, in the early Christian Church were, at first, letters granted to Christians on their removal from one place-to another; but, afterwards, the name came to be more strictly applied to letters granted to the clergy when they were to remove from their own diocese and settle in another, "No clergyman, of whatever degree," says the council of Trullo, "shall be entertained in sucther church of Trullo, "shall be entertained in another ch without the dimissory letters of his own bishop." the Church of England, dimissory letters are such as are given by a bishop to a candidate for holy orders, having a title in his diocese, directed to some other bishop, and giving leave for the bearer to be ordained by him. Persons inferior to bishops cannot, in ordinary

ses, grant these letters.

DINITY, dim'e-te (Du. diemit), a stout cotton cloth of a thick texture, generally striped, or otherwise ornamented in the loom. It is mostly white; but variogated dimities are frequently made, the pattern and the ground being of different colours. The figure or stripe is raised on one side and lowered on the other, so that the two sides present reversed patterns. Dimity is chiefly used for articles of female dress, and for bedfurniture or window-curtains.

DIMORPHISM, di-mor'-fizm (Gr. dis, twice; morphe, form), in Chem., the property possessed by certain bodies of assuming crystalline forms which cannot be derived from each other. Instances of this occur in the case of sulphur, which crystallizes as oblique prisms and as octahedra, according as it is crystallized by heat or from the solution in bisulphide of carbon.

DINGO, ding'-go (Canis Dingo), the native dog of Australia, regarded by some naturalists as a distinct species, but more generally as the descendant of a race once domesticated, and returned to its wild state. It is found in Australia both in a wild and tamed state; the tame dingo being about the size of our familiar sheep-dog, and the wild one somewhat larger. The latter has a large head, with a fuller muzzle than the sheep-dog; ears short and erect; tail bushy; colour tawny. It does not bark, and is very destructive to the sheep of the colonists; not so much on account of the amount of mest required for the satisfaction of its hunger, as from its savage habit of continuing to strangle as many sheep as its strength will allow before

at squats down to pick a bit of one. DINORNIS, di-nor-nis (Gr. deinos, wonderful or terrible; ornis, a bird), a gen. of large birds of the tribe Brevipennes. No species of the dinornis now exists, Brevipennes. No species of the dinornis now exists, but many bones belonging to birds of this class have been found in New Zealand, not only in the most recent deposits, but in the sand by the sea-shore, in caves, in swamps, in the soil of forests and in riverbeds. Among the natives there are many traditional reports about these birds, which were called most. Other large birds, such as the palapteryx and the aptornis, are also spoken of by them. It would appear that the dinornis became extinct at the end of the 17th or the beginning of the 18th century. According to the trabeginning of the 18th century. According to the tra-ditions of the natives, these birds must have had brilliantly-coloured plumage, and their flesh was a delicate food. For these two reasons they were objects stupid, anable to fly, and living in the mountains or in the depths of forests, feeding entirely on vegetable food. The bones of the diarraps have been closely was originally applied, under Constantine the Great,

#### Diocese

examined by comparative anatomists, and the descrip-tion of the natives coincides with the inferences drawn. The dinornia must have been considerably larger than any bird now existing; some of the bones found are twice as large as those of the estrich. The body must have been very bulky, and somewhat similar to that of the extinct dodo. The Dinornis giganteus must have been nearly eleven feet high. The bones of the legs are massive and semestably solid in structure. The are massive, and remarkably solid in structure. The num-ber of bones of the dinornis that have been found is very great. Several species have been recognized, and some skeletons have been nearly completely restored. The first bone examined by a naturalist was a leg-bone, and the naturalist was Professor Owen. From that bone alone he placed the dinorms in its correct place in the system of nature.

DINOSAURIA, di-no-saw-re-a (Gr. deinos, wonderful or terrible; autros, a lizard), a term applied to distinguish an order of extinct lizards found as fossils in the lias, colite, and wealden formations. There, are, however, no traces of them in the lower cretaceous strata. dinosauria were enormous reptiles of the lizard class, which approached nearer to the mammal type than any other of their order. Four powerful limbs supported their bodies, and the sacrum was composed of five vertebræ analgamated. The Mcgalosaurus, the Iguanodon, and the Hylmosaurus are the principal gen. of

the order.

DINOTHERIUM, di-no-the'-re-um (Gr. deinos, wonderful or terrible; therion, a wild beast), an extinct



DINOTHERIUM (RESTORED).

animal, whose cranial bones are found in the miocene formations of Germany, France, &c. Like the elephant.

remarkable anima Was provided with a pair of formidable tusks, which downwards from the lower It was juw. also provided on each side of its jaws with five double-ridged grind-ers. From the largeness of the nasal cavity, it supposed that the animal had a trunk like the elephant. As none of the body or limb bones of the dinotherium have been found, its true



SEULL OF DINOTHERIUM.

position in the ystem of nature is not accurately de-

# Diodon

to those larger civil divisions of the empire, each of which was under a prefect, and comprised several pro-vinces, which were under rectors. The government of the Church was adapted to this division, and each dio-cese was under the spiritual superintendence of an cese was under the spiritual superintendence of an archbishop, the term parish being applied to the charge of a bishop. Now the term diocese is equivalent to bishopric, and denotes the district over which the authority of a bishop extends. (See Bishopric.)

Diopon, di-o-don (Gr. dis, twice; cdous, tooth), a Linnæn gen. of fishes, now giving its name to a fam.—Diodontidæ. These fishes are about two feet in length,

of a nearly spherical form, and possess the pow inflating or contracting themselves at pleasure. When their stomachs are thus distended with air, there are displayed over the entire surface numerous spines, as though to protect its now somewhat unwieldy body from attack. It is, doubfless, this latter circumstance that has procured for the fish the titles of sex-porcupine and globe-fish. When inflated, the globe-fish is in-capable of swimming, but floats with the stream. They

capable of swimming, but noats with the stream. They are found in warm seas. The sun-fish is of this family.

DIONEA, di-o-ne'-a (from Dioni, one of the names of Venus), in Bott, a gen. of plants belonging to the nat. ord. Droseracea. The only species known is D. muscipula, a native of North America. This plant affords a remarkable instance of vegetable irritability. The leaf is two-lobed, and each lobe is furnished on its upper surface with three stiff hairs, which, on being touched have no investor way other charge the two belows. by an insect or any other object, cause the two halves to collapse and inclose the object. This plant, which is commonly known as Venus's fly-trap, is sometimes cultivated in our stoves.

Diorsis, di-op'-sis, a gen. of dipterous insects, remarkable for the length of the pedicles on which the eyes are situated. On this account it is likewise termed the telescope-fly. All the species are found in warm parts of the old world.

Diorraics, di-op'-triks (Gr. dioptrikes).—That por-tion of geometrical optics which treats of the passage of rays of light from one medium to another of a dif-

breath kind. (See Repraction, Ortics.)

Diorama, dia-ram'-i (Gr. dia, through; orac, I see), a method of painting and scenic exhibition invented by two French artists, Daguerre and Bouton. vented by two renear artists, Dagaerre and Bouton.
It does not possess all the advantages of a panorams, but produces a far greater degree of optical delusion. The peculiar effects of the diorams arise more particularly from the contrivances employed in exhibiting the painting. In the first place the picture is viewed through a proscenium; the room in which the spectators are is almost in darkness; and the light, which is admitted through coloured glass, falls upon the picture alone. It is principally used to illustrate architectural and interior views. By means of slides and shutters the light can be increased or diminished at will, and hence very pleasant effects can be represented; such as the ordinary change from daylight to sunshine, and from sunshine to cloudy weather or twilight. The from sunshine to cloudy weather or twilight. The diorams was first exhibited in Paris in 1822, and in London in 1823. It was at first very popular, a large building being creeted for its exhibition in Regent's Park. At first successful, it soon became unpopular, and the building is now used as a Baptist chapel

DIOSCORRA, di-os-kor'-e-ŭ, in Bot., the typical gen. of the nat. ord. Dioscoreaceæ. Various species, as D. alata, satica, and aculeata, produce the tubers called yams, which, when boiled, are esten in tropical countries as the potato is eaten in Europe. The Chinese yam is now cultivated in this country, and is

much esteemed by many as an esculent.

DIOSCOREACEE, di-os-kor-e-ai'-se-e, in Bot., the Yam family, a nat. ord. of monocotyledonous plants in the sub-class Dictyogenæ, consisting of shrubby plants with twining stems rising from tuberous root-stocks, with twining stems rising from tuberous root-stocks, or tubers placed above or under the ground, and having net-reined leaves, and small-spiked bractested flowers. They are natives chiefly of tropical countries, a few only being found in temperate regions. They are generally characterized by great acridity, though farinaccous matter adapted for food exists in the tubers of many species. (See Dissours, Tamus, Tartudi-Raria.) MARTA.

DIONNER, di-oz'-me-e (Gr. dios, divine; osme, smell). in Bot., a sub-ord. of the Rutacea (which see).

# Diphthone

DIOSPYROS, di-os'-pi-ros, imBot., a gen. of dicotyledonous trees, belonging to the nat. ord. Ebenacee. Many of the species have hard and dark-coloured heart-woods which constitute the different kinds of chony; thus, which constitute the different kinds of ebony; thus, D. Ebenum furnishes Mauritius ebony; D. melanozylon, a native of the Coromandel coast, the sort commonic known as black ebony; and D. Ebenuster, the basisard ebony of Ceylon. The beautifully variegated furniture—wood called Coromandel or Calamander wood, is obtained from D. kirsutu, and is brought to Europe from Ceylon. Other species also yield valuable timber. The fruit of D. Kaki is eaten in China. and is hown in the latter country as the and Japan, and is known in the latter country as the keg-fig. The fruit of D. wrginiana, a native of the United States, is sweet and edible when quite ripe, but very austere before then; hence it is frequently employed medicinally in its unripe state as an astringent. Dir, dip (Ang. Sax), in Min., a miner's and geologist's term for the direction of any mineral vein or stratum in relation to the horizon.

DIP, in Geol., the technical term for the angle at strata slope downwards into the earth. angle is messured from the plane of the horizon, and may be readily ascertained by the common spirit-level and plummet, or, as is usual among geologists, by a small pocket instrument called the chinometer (which see). To describe the opposite of dip, the term rise is used; and, as every bed that dips in one direction. must necessarily rise in another, either term may be used according to the position of the observer. For instance, a bed of coal which is spoken of by those on the surface as dipping to the south, would be described by the miners in the pit as rising to the north. The place where each bed rises to the surface of the ground place where each bed rises to the surface of the ground is called its outcrop or basset. Miners say that such and such beds "crop out" to the surface, and speak of their "basset edges." The line at right angles to the dip, that is, the line of outcrop of a bed along a level surface, is called its strike, a term introduced from the German by Professor Sedgwick. On geograph of the strike at the strike at the surface is called its strike, a term introduced from the German by Professor Sedgwick. logical maps the direction of the dip is generally indicated by an arrow, and the line of outerop, or strike of a stratum, by a bold line.

DIPHTHERIA, or DIPHTHERITIS, dif-the'-re-ë (Frdiphtherite, from Gr. diphthera, a skin or membrane),
is a very malignant and fatal disease of the throat,
which has recently made its appearance, and differs which has recently made its appearance, and unterser-from all other forms of sore throat previously known. It was first observed and described by M. Bretonneau, of Tours, in France, where it prevailed as an epidemic in 1818. It subsequently broke out in other French towns, and in 1857 it made its appearance in England, where it has since been, unfortunately, by no means rare, and has already caused a large amount of mortality. It is characterized by a peculiar inflammation of the mucous membrane of the throat, or pharyng, accompanied by the production of a false membrane. At first this membrane appears in the form of a white spot on the pharynx or tonsils, from which it gradually extends forwards to the soft palate and into the nos-trils, and backwards into the esophagus, sometimes into the larynx, but seldom into the traches, producing at length suffocation. It is usually accompanied by a feetid discharge from the nose and mouth, and hamorrhage frequently occurs. There is usually, also, a low and dangerous form of fever, with great depression of spirits and rapid decrease of the patient's strength, which is still further accelerated by his inability to take food. Various modes of treatment have been recommended. The patient's strength is to be supported by means of tonics and stimulants. Quining is generally recommended; and in most cases wino may be given with advantage. In the local treatment of the throat, nitrate of silver and chlorine are used. There can be little doubt that this disease is owing, in some measure, to the neglect of sanitary measures, and it is generally believed to be contagious, though some medical men deny both of these statements.

some medical men deny both of these statements.
DIPHTHONG, diff-thong (Gr. diphthogges, a double sound), in Gram, is a double vowel, or two vowels pronounced together or in rapid succession, so as to make only one syllable. Diphthongs, with relation to night, are distinguished from those with reference to sound: as an instance of the former, we have mouse; of the latter, mind. Many double vowels, however,

are not real diphthongs, because the sound of only one of the vowels is heard; as in bread, field.

of the vowels is heard; as in bread, field.
DIPLOMA, dip-lot-ma (Gr. from diplos, double), originally denoted any charter, letter, or other composition, written on parchment and folded. Afterwards it came to be applied to a letter or writing of a sovereign, conferring some title or dignity, or granting some privilege or immunity. The term is now commonly applied to a letter or instrument duly signed and given by a university or other learned accient. and given by a university or other learned society, in proof of the holder having a certain degree, or licensing him to practise a certain art.

Diffomacy, dip-lo'-md-se (Gr. diploma), is the art of conducting the official intercourse of separate states,

and particularly of negotiating treaties. The term is of recent origin, having only come into general use since the beginning of the present century, and is not to be found in Johnson's Dictionary. The art itself to be found in Johnson's Dictionary. The art tises is very ancient, and must have originated when people began to form themselves into distinct nations. In the earliest periods of history we read of heralds or messengers employed in carrying messages from one king or state to another, though regular and permanent embassics at foreign courts do not seem to have been maintained by any nation pre-vious to the 16th century. The subject has usually been treated under the head of Law of Nations; but in reality the two are quite distinct. The diplomatist requires undoubtedly to be sequainted with international law, and to observe its general conditions; but otherwise his sphere of operations is distinct and independent of it. Besides attending to the larger operations connected with treaties or alliances, the diplomatist has to keep a vigilant eye on the minor details of international law, to eee that these are equitably administered; in which seuse he is like a "law-agent, whose duty it is to see that his client receives justice at the hands of other nations under this code." It is, perhaps, worthy of notice that the term is frequently perhaps, worthy of notice that the term is requestly used in ordinary conversation to denote a certain degree of underhand cunning; and conduct which is wily and subtle, without being directly false or fraudulent, is styled diplomatic. It is generally in weak states that the science of diplomacy has flourished most. It owes its first marked development as a science to the Italian republics, who, exposed as they were to the attacks of great military monarchies, cultivated the attacks of great military monarchies, enliviated diplomacy with peculiar care. Their politicians, conspicuous among whom was Machiavelli, became celebrated for their unrivalled skill in the science; and it was long the practice of the greater states of Europe to employ Italians in negotiation, on account of their supposed peculiar aptitude for the subtleties of the profession. Italian diplomacy was in general profound, cautious, and unserupulous. It occupied itself much in forming combinations and alliances, and sometimes did not disdain to bribe, steal, forge, or even to murder. in order to accomplish its forge, or even to murder, in order to accomplish its objects. The origin of modern diplomacy is usually traced to the reign of Henry IV. of France (1599-1610), a monarch who was all his life surrounded by singularly delicate and difficult complications, and who was privileged to have about him remarkably able states men and negotiators, pre-eminent among whom was the famous Sully. Cardinal Richelieu (1624-42) con-tinued the foreign policy of France on the method of Henry IV., and is generally regarded as the founder of the present system of maintaining permanent legations at foreign courts. It was during his administra-tion that French began to supersede Latin as the language of diplomacy in Europe. Diplomacy greatly enlarged its field of action in the 17th century, and the ambitious and warlike policy of Louis XIV. exercised a marked influence upon the character of the diplomacy of his times. Artifices unknown to primitive

greatly extended. This extension of commerce, par-ticularly to distant parts, as America, Africa, and the West Indies, led to improvements and a remodelling of one branch of the diplomatic service,—the consular. The French revolution and the long series of wars that succeeded it wrought a great change in the character of diplomacy, by raising up gigantic combinations against Napoleon and against the revolutionary spirit of the times. In 1815 the monarche of the great continental states sought to strengthen themselves against revolution by forming what was termed the Holy Alli-ance, which, in reality, was merely a combination among the several members to aid each other in suppressing any attempts that might be made in favour of constitutional principles within the dominious of any member of the league. The last event that called forth much diplomatic skill was the late war with Russia, which was both ushered in and succeeded by a large amount of diplomacy. According to the Baron de Martens, whose work is still the chief authority on this subject, diplomacy is at the same time one of the most important and one of the most difficult by anches of human knowledge. The fate of a nation depends very much, in the present state of the world, upon its relations with others; and these, again, are materially influenced and determined by its diplomacy. The diverse and ever-changing relations subsisting between different states, dependent upon their character and constitution, their power, real or presumed, their alliances, discords, the vicissitudes of events, &c., all come under consideration in diplomacy. From history, from treaties, and from diplomatic correspondence much, indeed, may be learned; but these are not all. The same events may, indeed, reproduce themselves at different epochs, and the same subjects may come up for discussion; but a diversity of incidents, sudden and unforeseen events, the difference of manners, of interests and views, and the character of the actors, may so completely and suddenly change the aspect of affairs, that the same subjects may present, when least expected, a striking dissemblance, and the example which had been chosen may cease to furnish a line of conduct. The determining motives can only be seen from a full and entire knowledge of all the circumstances of the case; and the diplomatist must also have a forethought to the events more or less probable by which these may be modified or changed. The branches of knowledge which the diplomatist ought to be specially versed in, as given by Do Martens, are as follows:—1. The natural law of nations, and public law in general, which supply the fundamental maxims of all positive legislation in political matters. 2. The positive law of European nations, which is founded on treaties and usages which modify fundamental maxims, and regulate the relations modify fundamental maxims, and regulate the relations of the different nations, both in war and peace. 3. The public law of the principal states of Europe, which is founded on the laws of each particular state. 4. History and its subsidiary branches, particularly the history of wars, of negotiations, and treaties, which serve to make known the progress and tendency of cabinets. 5. The various political means that may be brought into contributes. brought into operation; as concession, retention, confederation, and the like. 6. Political economy, which shows how social wealth, independence, and organization form, distribute, and perfect themselves. 7. The geography and statistics of the separate states. S. The conduct of negotiations, or the course to be followed in treating of the interests of different states; and 9. The art of composing diplomatic dispatches. Diplomatic agents in Europe rank, according to the congress of Vienna, as follows:—1. ambassadors; 2. envoys extraordinary and ministers plenipotentiary; 3. ministers resident; 4. charges d'affaires; 5. secre-taries of legations and attachés; the last, however, diplomacy of his times. Artifices unknown to primitive diplomacy were freely resorted to, such as secret and diplomacy were freely resorted to, such as secret and one precise diplomatic character, and are only by separate articles in treaties; and it has been suspected that even sham treaties were promulgated, to mislead to the general public. During the period from the diplomacy of Europe Trench revolution (1789), the diplomacy of Europe assumed an aspect very different from that of the preceding century. The nations were exhausted by continued wars, and sought rather to cultivate the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the continued wars, and sought rather to cultivate the arts of peace, and industry and commerce were the arts of peace, and industry and commerce were the arts of peace are the arts of the secretary of the secretary of state for foreign affairs for this country the official organ and adtachés: the last, however, have no precise diplomatic character, and arts only by courtesy considered as attached to the legations. The courtesy considered as attached to the courtesy considered as attached to the courtesy

#### Diplomatics

hassadors abroad.-Ref. Baron C. de Martens, Le

Guide Diplomatique, 1857.

1) IPLOMATICS, dip-lo-mät'-iks, which is not to be confounded with the above, is the science of diplomas,—o founded with the above, is the science of diplomas,—of deciphering ancient writings, and judging of their churacter, value, date, &c. The most ancient diplomas that we possess do not extend beyond the 5th century of our ers, when parchment seems first to have come into general use, the material commonly used prior to that time being the leaves of the Egyptian papyrus. It is only since the middle of the 17th century that diplomatics has been raised to the dignity of a science, and its importance recognized as one of the chief sources of historical knowledge. The first who attempted to reduce it to a system was the Jesuit Papebroek, of Antwerp, who, about 1675, published a who attempted to reduce it to a system was the Jesuit Papebroek, of Antwerp, who, about 1675, published a work on this subject, entitled "Propylacum." He was succeeded by John Mabillon, whose able and learned work, "Do ke Diplomatica," first appeared at Paris in 1881. After him came Maffei, the Italian, whose work, "Istoria Diplomatica," was published at Mantun in 1727. The most learned and claborate work on this subject. work, "Istoria Diplomatica," was published at Mantua in 1727. The most learned and claborate work on this subject, however, and which has been of immense service to subsequent labourers in this field, is the "Nouveau Traité de Diplomatique," by MM. Tousaint and Tassin, two Benedictine monks of St. Maur, 6vols. 4to, Paris, 1750-65, with 100 plates. Diplomatics was reduced to a systematic form by Gatterer, in his "Elementa Artis Diplomatice" (1765), and afterwards in his "Abriss der Diplomatik" (1798). A more able work, however, was Schoenemanu's "Versuch eines vollständigen Systems der Diplomatik," 2 vols. (Hamb. 1804-1). Among the more recent works on this subject are Kopp's "Palcographia Critica," 4 vols. (Manh. 1817-29); and Pertz's "Schrifttafahr" (Hanover, 1846). In order to distinguish the authentic from the counterfeit, and to be able to say to what period a the counterfeit, and to be able to say to what period a diploma belongs, it is necessary to observe all its external marks and characters, the form in which it is made up, the parchment on which it is written, and the ink that has been used. It is not difficult for those who apply themselves to this study to distinguish the parchment as well as the ink of the ancients, from that of the moderns; but that which best distinguishes the original from the counterfeit is the writing or character itself, which is so different at different times, that one skilled in the science can generally tell with certainty, within forty or fifty years, when any diploma was written. All diplomas are written in Latin, and consequently the letters and characters have a general resemblance to each other; but there are certain strokes of the pen that distinguish not only the ages but the different nations among which they have been produced. The successive corruptions of the Latin tongue, the style and orthography of each age, as well as their dif-ferent titles and forms; the abbreviations, accentuations, and punctuation, and the different methods of writing the dipluthougs, all these form so many marks and characters by which the authenticity of a diploma is to be judged. Attention to these minute points is the more necessary, as some of the monks and priests were very expert at making counterfeits, and frequently enjoyed the confidence of princes and statesmen, being sometimes even intrusted with their rings and seals. The signature of the diploma consists either of the sign of the cross, or of a monogram or cipher, composed of the letters of the names of those who subcomposed of the name, and some scribed it. The initial letters of the name, and some times also the titles, were placed about this cross. By degrees, the custom changed, and they invented other marks. They sometimes added also the date and epoch marks. They sometimes added also the date and epoch of the signature, the feasts of the church, days of the calendar, &c. The seal annexed to a diploma was anciently of white wax, and artfully imprinted on the parchment itself. It was afterwards pendent from the paper, and inclosed in a box or case, which they called bulla. There are some also that are stamped on metal,

## Diptera

Dippel's animal oil, which contains an immense number of bases of great interest. It is often called bone-oil.

DIPPER (Cinclus), a gen. of birds of the Thrush sam, the British representative of which is the common dipper, or water-ousel. This bird is rather smaller than the thrush, of a dark-brown colour, with throat and upper parts pure white. The facility with which the dipper dives and pursues its prey beneath the water is very remarkable. It has been remarked that when it wades deeper than the knee, it displays its wings, and hangs them down. It was related by an eye-witness to Buffon, that this bird, when at the bottom of the water, appeared enveloped with air, which gave it a brilliant surface, like some kinds of beetles, which, when immersed in water, are always inclosed in a bubble of air. Its object in drooping its wings on entering the water may be to conflue the air. fam., the British representative of which is the comwings on entering the water may be to conflue the air. The dipper builds a very curious nest, composed of moss, domed, and with an entrance at the side: the site chosen is generally the bank of a stream, or sometimes under a cascade.

DIPPING-NEEDLE, dip'-ping.—This instrument consists of a frame in which a graduated circle is fixed in a vertical position. The frame itself moves on a graduated circle in a horizontal position, fixed on a small tripod that can be adjusted by means of levelling-screws. The needle is suspended on two knife-edges of agate, fixed in the frame exactly in the centre of the vertical circle, and moves freely in any direction in a vertical plane. When the vertical plane in which the needle moves coincides with that of the magnetic meridian of any place, the needle inclines from a horizontal position, and forms an angle with the horizontal line. This angle of inclination is called the dip of the nuc. This angle of inclination is called the dip of the needle. The dip varies like the angle of declination at different parts of the earth's surface, and at the same place at different periods. It also varies at different heights above the earth's surface. In 1576, when this property of the needle was first discovered by Robert Norman, the devression of the needle was property of the needle was first discovered by Robert Korman, the depression of the north end was about 71°,60°; in 1723 it had increased to 74° 42°; but at present it is about 68° 30°. When the plane of the needle is at right angles to the vertical plane of the magnetic meridian, the needle assumes a vertical position; but when it is in the plane of that meridian, the dip is the least. When the needle is in a vertical position, it gives us the means of determining the magnetic meridian by moving the vernier attached to the horizontal circle of the instrument over the space of 90°, which brings the vertical circle and needle into the plane of the magnetic meridian, and causes the latter to serve the purpose of a declination needle.

the purpose of a declination-needle.

DIFSACACE, dip. & levi-see e (probably from Gr. dipsac, I thirst), in Bot., the Teazel fam., a nat. ord. of dicotyledonous plants in the sub-class Coroliflore, consisting of herbs and undershrubs with opposite or verticillate leaves, and capitate or verticillate flowers surrounded by a many-leaved involuere. They are chiefly natives of the south of Europe, the Levant, and the Cape of Good Hope. Some are reputed to nossess astringent and febrifural properties. reputed to possess astringent and febrifugal properties, reputed to possess astringent and febritugal properties, but as remedial agents they are altogether unimportant. One very useful plant belongs to the order, namely Dipsacus Fullonum, the fuller's teazel, the dried heads of which have long been employed for dressing cloth. Their hooked bracts are just stiff enough to raise the nap, but too yielding to tear the

DIPSOMANIA, Or OINOMANIA, dip-so-mai'-ne-il (Gr. dipsa, thirst; oinos, wine; manta, madness), a term re-cently applied to an inordinate or insane craving for alcoholic stimulants. Lately medical men have come to the opinion that the inveterate drunkard is to be regarded as habitually under the influence of an insane impulse as naorcaary under the numerice of as insane impulse which it is impossible for him to resist, and which, therefore, renders him a fit subject for confinement or restraint. In 1844 the English lunacy commissioners urged the justice as well as the expediency of the confinement of habitual drunkards in our lunatic asylums,

bulla. There are some also that are stamped on metal, and even on pure gold.

Diplotegia, dip-lo-te'-je-a (Gr. diplos, double), in Bot., a kind of fruit resembling the ordinary capsule in every respect, except that it is inferior. It is the only inferior fruit which presents a dry dehiscent ericarp. Examples are seen in the campanulas.

Dipper's Oir, dip-pels, in Chem.—The dry distillation of bones yields a substance known to chemists as the distinguished to only both of the distinguished by having two clubbed appendages, called katteres or the distinguished by having two clubbed appendages, called katteres or the distinguished by having two clubbed appendages, called katteres or the distinguished by having two clubbed appendages, called katteres or the distinguished by having two clubbed appendages, called katteres or the distinguished the distinguished by having two clubbed appendages, called katteres or the distinguished the distin

#### Dipteracem

balancers, which seem to be the rudiments of two posterior wings. In ordinary language the dipters are called flies, usually with some characteristic prefix; such as the housefly, blow-fly, &c. The term fly, however, is often applied to insects which do not belong to the dipters; as butterfly, dragon-fly, May-fly, &c.
Mosquitoes, gnats, and midges belong to the diptera.
It is one of the most extensive of the orders of insects, and some of the species are remarkable for the extra-ordinary numbers in which they appear. The larvar of the order have frequently a membranous head, and always have the stigmats, or breathing-pores, confined to the second and terminal segments of the body. Dipterous insects are also distinguished by having the mouth in the form of a sucker, composed of from two to six lancet-shaped clongated scales, inclosing a canal upon the upper surface of the tongue or proboscis.

DIFFERCEE, dip-ter-ai'-se-e, in Bot., the Sumatra camphor fam., a nat. ord. of dicotyledons, in the subclass Thalamiflore, consisting of large trees, with simple alternate involute leaves and large deciduous convolute stipules. The flowers are perfect and symmetrical, being composed as follows:—Calyx and corolla each with five divisions; the former unequal, permanent, imbricated in sestivation, and ultimately enlarged so as to form wing-like expansions crowning the fruit; the latter with equal petals, and twisted in restivation. Stamens hypogynous, numerous, with beaked anthers. The fruit is 1-celled and 1-seeded; seed without albumen; radicle superior. The plants of this order are all natives of the forests of the tropical East Indies, with the exception of the genus Lophira, which belongs to tropical Africs. This genus has been placed in an order by itself, called Lophiracea, by some botanists. The useful products of the order are electresinous apparatuses. The DETERGRAPHS DESCRIPTION PRODUCTIONS OF THE PROPERTY OF THE mbstances. (See DIPTEROCARPUS, DRYOBALANOPS, Vateria.)

DIPPEROCAPPUS, dip-ter-o-kar'-pus (Gr., double-winged carpel), in Bot., a gen. of plants belonging to the nat. ord. Dipteraceae. Several species, as D. turbi-matus, costatus, alatus, and incanus, yield an oleo-resinous substance, called wood-oil or Gurjun balsam,

resmous substance, called wood-oil or Gurjun balsam, which resembles in its properties the so-called balsam of copaiba, and which is used for similar purposes. In India wood-oil has been employed for painting houses. Diptract, dip'der-iks, in Bot., a gen. of plants belonging to the nat. ord. Leguminosa, sub-ord. Papilio-macea. The seeds of D. odorata, a native of Guiana, have a very powerful and agreeable odour, which is due to the presence of a volatile oil containing coursering. They are need for securing a welf and in permarin. They are used for scenting snuff and in per-fumery, and are commonly called Tonquin or Tonks beans.

DIFFORE, dip'-tote (Gr. dis, twice; pipto, I fall), in Gram., is applied to a noun that has only two cases. DIFFICE, dip'-tik (Gr. diptuckon, folded together), properly signifies something folded, and was originally used in the same sense as diploma. Diptychs, however, were usually tablets of metal, ivory, or wood, of equal size, fastened together by a hinge or ring, and were frequently beautifully carved on the outside. They were early in use among the Greaks and Bonnara and were early in use among the Greeks and Romans, sud were also common in the early Christian Church, where they were used as registers. The ecclesiastical diptychs were of three kinds;—the diptycha mortuorum, in which the names of all such as had died in the odour of sanctity were enrolled; diptycha vivorum, containing the names of such as were still alive and deserved well of the church; and the diptycha episcope-rum, containing the names of distinguished bishops. Portions of these were read during the celebration of the mass; and it was also the custom in some churches for the descon to rehearse from these books the names of eminent bishops, saints, or martyrs, before they made oblation for the dead. The names of those excommunicated were erased from the diptychs; but they were again restored upon their readmission into the church.

DIRECT and RETROGRADE, di'-rekt ret'-ro-graid (Lat. directus, retro, backwards, and gradus, a step), in Astron., when the motion of any beavenly body is from tron., when the motion of any heavenly hody is from
west to east, or in the direction and order of the signs
of the zodiac, it is said to be direct; when the motion
is in the contrary direction, or from east to west, it is
It was designed to supply the place of the Liturgy, or
asid to be retrograde. The motion of all the heavenly

Book of Common Prayer, the use of which the parlia-

## Directory

bodies, except some of the comets, is direct. The apparent motion of the heavens is retrograde, because the earth a motion is direct. By the astronomers of the 15th and 16th centuries, bodies in direct motion were said to move in antecedentia, and those in retrograde motion, in consequentia.

Dieker, in Mus., a certain character placed at the

end of a staff to indicate to the performer the situation of the first note on the succeeding staff, and is for this purpose always situated on that line or space in its own staff which corresponds with the line or space occupied by the note which it is intended to announce in the

DIRECTOR, di-rek'-tor (Lat. dirige, I make straight), in general, is one who has the chief management of a scheme, design, or undertaking. More particularly, he is one of a number of persons chosen by a plurality of votes from among the body of proprietors to conduct the affairs of some joint-stock undertaking, as a bank, railway, assurance company, or the like. In most cases, the directors are required to be possessed of a certain amount of stock, and frequently also they are allowed a small honorarium for their services. whole of the directors, collectively, form the board of directors; and they are generally invested with certain powers by the acts of the legislature to which they owe their existence. In the case of banks there are usually two kinds of directors,—ordinary and extraordinary; the former for seeing to the ordinary business of the concern; the latter attending only on particular occasions. The office of a director is one of no small risk sions. The office of a director is one of no small risk and responsibility, and several stringent enactments have recently been passed regarding it. Act 20 & 21 Vict. c. 54, declares any person being a director, public officer, or manager of a company, who shall make, circulate, or publish, or concur in making, circulate. culating, or publishing, any written statement or account which he shall know to be false in any maaccount which he shall know to be take in any mar-terial particular, with intent to deceive any member, shareholder, or creditor, of such body or company; or with intent to induce any person to become a share-holder or partner therein, or to intrust or advance any money or property to such body or company, or to enter into any security for the benefit thereof, shall be guilty of a misdemeanor, and liable to penal servitude for three years. Directors generally have the super-intendence and management of all the uffairs of the company, except in such matters as require the approval of the general body of the proprietors. A portion of the directors usually retire annually by rotation, and their successors are nominated at a general meeting of the proprietors. Directors elect their own chairman, and may also delegate their powers to committees. The presence of a certain number of the directors, called a guorum, is necessary before any business can be transacted. They are required to keep minutes of all their meetings, and of all the business transacted at these meetings and of all the business transacted at these meetings, such minutes being transacted at these meetings, such minutes being signed by the chairman, and received as evidence of what took place. By Act 19 & 20 Vict. c. 47, regarding joint-stock companies, it is declared that if the directors shall declare a dividend when the company is known by them to be insolvent, or a dividend, the payment of which would render it insolvent, they shall be jointly and severally liable for the debts of the company when the payer is the payer of the company. that may be then existing, or that shall be thereafter contracted, so long as they may remain in office, provided the amount for which they shall be so liable shall not exceed the amount of the dividend declared.

not exceed the amount of the dividend declared.

Directors, di-rek'-tor-e, in the first French revolution, is the name given to the highest governing body to whom the executive authority was committed by the constitution of the year III. (1795). It was composed of five members, the first of whom were Barras, Rewbel, Lepeaux, Letourneur, and Carnot. They ruled in connection with the two legislative chambers, called the Council of Anoients and Council of Five Hundred. By the revolution of the 19th Brumsire (1769), this body and the constitution of the year III. were abolished. But the constitution of the year III. were abolished, and the consulate established

## Direct Taxation

It consisted of some general ment had abolished. heads, which were to be managed and filled up at discretion, for it prescribed no form of prayer or circum-stances of external worship, nor obliged the people to any responses excepting Amen. It forbids all salutaany responses excepting Altern. To other a same tion and civil ceremony in the churches. The reading of Scripture in the congregation is declared to be part of the pastoral office. All the canonical books of the Old and New Testaments (but none of the Apocrypha) are to be publicly read in the vulgar tongue. If pre-scribes heads for the prayer before sermon; and it delivers rules for the management of the sermon. The introduction to the text must be short and clear, drawn from the words or context, or some parallel place of Scripture. In dividing the text, the minister is to regard the order of the matter more than that of the words; he is not to burden the memory of his audience with too many divisions, nor perplex their understandings with logical phrases and terms of art; he is not to start unnecessary objections, and he is to be very sparing in citations from ecclesiastical or other human writers, ancient or modern. It recommends the use of the Lord's Prayer as the most perfect model of devotion. It forbids private or lay persons to administer baptism, and enjoins it to be performed in the face of the congregation. It orders the communion-table at the Lord's Supper to be so placed that the communicants may sit about it, and the dead are to be buried without any prevalent and the dead are to be buried. cants may sit about it, and the dead are to be buried such as it appears to us; for though they are really without any prayers or religious ceremony. It also sherical bodies, they are appearently circular planes, orders that the sabbath be kept strictly, both publicly that the sabbath be kept strictly, both publicly the diameter of the disc is considered as divided into and privately; that days of fasting or thanksgiving are twelve equal parts, called digits; by which means the two be observed, as may be deemed necessary; but that all festivals are to be abolished, and no day kept but In a total eclipse of either of those luminaries, the the Lord's-day. It also asserts that the singing of whole disc is observed or darkened; in a partial palms together in the congregation is the duty of Christians, and that no place is capable of any holimess in consequence of consecration. The use of the Directory was enforced by an ordinance of the Lords and Commons at Westminster, which was repeated in and Commons at Westminster, which was repeated in 1645, and a fine imposed upon such ministers as should read any other form than that imposed by the Directory. The king, in return, by a proclamation dated from Oxford in the same year, forbade the use of the

position performed at funerals.

DIRK, durk (Scot. durk), the name of a short dagger or poniard, now applied to the little weapon worn by



DIRK.

cadets in the royal navy. It appears to be derived from an old English verb, dirke, to stab, which is now It appears to be derived obsolete.

DIRT-BEDS, durt, in Geol., dark-coloured loam-like beds that occur interstratified with the colitic limestones and sandstones of Portland, and which are evidently the soils in which the eyeads and zamias of the period grew. Stumps of trees in an erect position, with their roots extending beneath them, have been found in these strata.

Drs, dis (Lat.), a prefix or inseparable preposition derived from the Latin, whence the French day. signifies a separation or parting from, and has thus the

signifies a separation or parting from, and any subset force of a privative or negative in meaning; as in the words dis-able, dis-oblige, &c. In some cases it still signifies separation; as in dis-connect.

DISABILITY, dis-ābil'-e-te (Lat. dis, and habilis, able), is the incapacity of a person to do any legal act. It is said to be absolute when it wholly disables a person,—

# Disciple

ness, and the like. Disability is ordinarily said to arise in four ways,—(1) By the act of the ancestor; (2) by the act of the party himself; (3) by the act of law; and (4) by the act of God.

DISAFFOREST, or DEAFFOREST, dis'-af-for-est, in Law, is to discharge from being a forest; to reduce from the privileges of a forest to the state of common

ground.

DISBAR, dis-bar', in Law, is to expel from the bar; to degrade a barrister from his rank or position. In England this power is vested in the benchers of the four inns of court; but it is never exercised except in very flagrant cas

Disc, disk (Lat. discus), in Bot., a term now applied to whatever intervenes between the stamens and the ovary upon the thalamus. It presents great variety of forms: thus in the Orange it forms a fieshy ring, surrounding the base of the pistil; in the Tree Paony, the dark-rad ann-shaped averaging covaring nearly the a dark-red cup-shaped expansion, covering nearly the whole of the pistil except the stigmas; in the Rose, a sort of waxy lining to the tube of the calyx; in umsort of waxy lining to the tube of the calyx; in umbelliferous plants, a swelling on the top of the ovaries, adhering to the styles. In other cases, the diac is reduced to little separate glandular bodies, as in cruciferous plants; or to scales, as in the Vine; or to various petaloid expansions, as in the Aquilegia.

Disc, or Disk, the body or face of the sun or moon, such as it appears to us; for though they are really spherical bodies, they are apparently circular planes. The diameter of the disc is considered as divided into twelve could parts, called digits: by which means the

substance; a thin circular plate of any substance.

DISCHARGE, dis-tsharj' (Fr. dicharger), in Mil., the term applied to the release of a non-commissioned officer or private from the duties which he has voluntarily undertaken for a certain number of years at the time of his enlistment. When the end of the time for which he from Oxford in the same year, forbade the use of the has agreed to serve has arrived, he can legally claim Directory, and enjoined the continuance of the Liturgy. his discharge; but should he desire to leave the regiment and the General Assembly of ment before his period of service has ended, he must the Church of Scotland adopted the Directory. Many obtain the permission of his commanding officer to do of its regulations are still complied with in that clurch, so, and pay a certain sum in compensation for the loss and it is usually appended to the Confession of Fuith. of his services. This sum is generally about £20; but, if he be a skilled artisan in the engineers or artillery, he may have to pay as much as £35 or £40. When as he may have to pay as much as £35 or £40. When a soldier is discharged for misconduct, he is degraded DIRECT TRAITION. (See TRAITION.)

DIRECT TRAITION. (See TRAITION.)

DIRECT MAY INVESTIGATION (See TRAITION.)

Soldier is discharged for misconduct, he is degraded bridged to the control of the antiphona "Dirige Domine Deus," chauted stripes, buttons, and facings torn from his uniform, in the funeral service of the Roman Catholic church.

It is now used to express a solemn and mournful companions of the service. At the solemn control of the service. At the solemn control of the service. The time of his discharge, every soldier receives a certificate the service of the service. stripes, buttons, and facings torn from his uniform, and he is then "drummed out" of the service. At the time of his discharge, every soldier receives a certificate, signed by the commanding officer of the regiment, stating his character and the time for which he has served.

DISCHARGING-ROD, dis-tsharj'-ing, an instrument much used in electricity for discharging Leyden jars

without partaking of the shock. The jointed discharging rod is that most generally employed. It consists of two brass wires, terminated by two brass balls. The wires are jointed at the middle, and are attached to a glass handle. With this instrument glass handle. With this instrument it is easy to discharge a jar or battery, by bringing one ball in contact with the exterior, and the other with some part of the interior. The glass handle, as an insulator, forms a pro-tection from all the effects which take place in the restoration of elec-trical equilibrium.



ROD.

DISCIPLE, dis-i'-pl (Lat. discipulus, from disco, I learn), strictly means one who learns anything from another; and hence the followers of any teacher, philosopher, or head of a sect, came to be called his disci-ples. In this sense it is sometimes used in Scripture; DISABILITY, dis-d-bil'-e-te (Lat. dis, and habilis, able), is the incapacity of a person to do any legal act. It is said to be absolute when it wholly disables a person,—sa outlawry, excommunication, attainder, alienage; or as outlawry, excommunication, disables, disables are so that the last of these,—the followers of Jesus. Sometimes all who received the doctrines of Christ are partial,—as infancy coverture, idiotey, hunacy, drunken—659 ples.

## Disciplina Arcani

plied to the seventy or seventy-two persons that were his more immediate followers and attendants. Sometimes it is used as synonymous with apostles, and

times it is used as synonymous with aposties, and applied to the twelve.

DISCIPLINA ARCANI, dis-e-pli'-nd ar-kai'-ni (Lat., discipline of the secret), in Ecol. Hist., is the name given to a system that prevailed in the early primitive church, of concealing from unbelievers, and even from catechumens, certain parts of their worship, and especially the sacraments. Even ministers, when led in their public discourses to speak of the sacraments or the higher doctrines of faith, contented themselves with remote akusions, adding, "the initiated know what is meant." It is difficult to account for the introduction of a system so contrary to the spirit of Christianity. Neander supposes that it took its rise in the church of Alexandria, whence it extended first to the Eastern and afterwards to the Western churches. It appears to have been gradually established after the 2nd century, and is supposed to have reached its perfection during the 4th.

Discripting, dis'-ip-lin (Lat. disciplina), signifies literally instruction, cultivation, improvement; but it is applied figuratively to a rule or order of government; a particular mode of life, in accordance with the rules of some profession or society; also chastisement or correction, bodily punishment or morbification. In military matters it denotes obedience to and exercise of the laws and regulations of the service. In ecclesiastical affairs it is the putting in force of the laws instituted by any particular church to preserve its unity, purity, and usefulness. At an early period of the Church, it consisted in depriving the offender of all the privileges and benefits of baptism, by turning him out of the society and communion of the Church. The offender was first solemnly admonished once or twice, before he was cut off from the communion, or expelled from the Church. The person was then held to be excommunicate, and the faithful shunned and avoided him.

Discripint, Books or, in the Eccl. Hist. of Scotland, are certain documents drawn up and published for the direction and guidance of the reformed church in that country. The first Book of Discipline was drawn up, at the request of the General Assembly of 1560, by John Knox and other eminent Scottish reformers of the time, approved by the General Assembly, and subscribed by the majority of the nobles and inferior barons and gentry composing the privy council of the kingdom. It was characterized by a vigorous exercise of ecclesiastical discipline against all offenders; for, say they, "the kirk of God can neither be brought to purity, nor yet be retained in the same, without the order of ecclesiastical discipline, which stands in reproving and correcting the faults which the civil sword doth not or may not punish." In this matter they followed the example of the early Christian church; for they justly regarded the relaxation of discipline under the papacy as one great cause of its universal corruption. It is also worthy of remark, as showing the advanced views of the authors of this document, that it takes special notice of the subject of education, viewing it as necessarily connected with religion. It lays it down as imperatively necessary that there should be a school in every parish, for the instruction for youth in the principles of religion, grammar, and the Latin tongue; and it further proposed that a college should be receted in every "notable town," in which logic and rhetoric should be taught, along with the learned languages; for "the rich and potent may not be permitted to suffer their children to spend their youth in vain idleness, as heretofore they have done; but they must be exhorted, and, by the censure of the church, compelled to dedicate their sons, by Itraining them up in I good exercise, to the profit of the kirk and commonwealth; and that they must do of their own expenses, because they are able. The children of the poor must be supported and sustained on the charge of the kirk." The Second Bo

#### Discontinuance

State; and it begins by laying down the essential line of distinction between the two powers. The civil power appertains to the civil government of the common-wealth; the ecclesiastical power flows immediately from God and the Mediator Jesus Christ, and is spiritual, not having a temporal head upon earth. Civil authority has for its object the promoting of external peace and quietness among the subjects; ecclesiastical authority, the direction of men in matters of religion and which pertain to conscience. The former enforces obedience by external means, the latter by spiritual means; and as they be both of God, and tend to one ead, they ought to co-operate within their respective spheres, and fortify one another. There are three kinds of church officers,—ministers, who preach and rule; cletre, who are merely rulers; and deacons, who act as distributors of alms and managers of the funds of the church. The office-bearers are to be admitted by election and ordination, and none are to be intruded contrary to the will of the congregation to which they are to be appointed. The document, says Dr. McCrie, "is a form of ecclesiastical polity, whose practical utility has been proportioned to the purity in which its principles have been maintained. Accordingly, it has secured the cordial and lasting attachment of the people of Scotland. . . And the principal secessions which have been made from the national church in this part of the kingdom have been stated not in the way of dissent from its censtitution, as in England, but in opposition to departures, real or alleged, from its original and genuine principles." (Life of Metville.)—Ref. Hetherington's History of the Church of Scotland.

Discipline, Military and Naval, a general term applied to the rules for regulating the behaviour of soldiers and sailors. Discipline is maintained and directed by the War-office and the Admiralty; and the Articles of War and the Mutiny Act are the principal grounds upon which they act. In practice, the adjutant maintains regimental discipline; and the adjutant general is in relation to the whole army what the adjutant is to his regiment. The regimental adjutant superintends the drill and field movements, inspects the guards, escorts, &c., receives garrison orders, keeps regimental books, &c. The military discipline of volunteer regiments is maintained by adjutants appointed by the War-office.

DISCLAIMER, dis-klaim'-er (Lat. negative dis; clamo, I call for), in Law, is a plen in which a party in a suit disclaims or denies all interest in the matter in question. It is more particularly applied to the denial by an alleged tenant of nis tenancy, which operates as a forfeiture of the lands to the lord, if he succeed in received in terms of the lands to the lord, if he succeed in

proving his terancy.

DISCONTENT, dis'-kon-tent (Lat. dis, and contentus, content), is dissatisfaction with our present condition, and is not only a source of wretchedness to the individual himself, but of annoyance to all with whom he may be brought into contact. It is generally owing, not so much to the actual circumstances of the individual as to a bad condition of mind, leading him to contrast his condition with that of those whom he regards as placed in more favoured circumstances than himself, without considering the many points in which he is more favoured than others. Discontent frequently springs not so much from actual ills, as from a dread of those which are expected. But, as pleasures are rarely so great in actual enjoyment as in anticipation, it is the same with evils. All experience testifies to the truth of the Christian maxim, that "sufficient for the day is the evil thereof," while every one's past history must furnish him with instances of what at the time he regarded as evils, but which eventually turned out for good.

DISCONTINUANCE, dis'-kon-tim'-u-dias (Lat. dis, and

training them up in j good exercise, to the pront of the kirk and commonwealth; and that they must do the kirk and commonwealth; and that they must do of their own expenses, because they are able. The children of the poor must be supported and sustained on the charge of the kirk." The Second Book of Discipline was adopted by the General Assembly in 1578, and, though never formally ratified by act of parliament, it is still regarded as the standard work on matters of order and administration by Scotch Presbyterians. It was prepared at a time when much continued to the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession, of a plea, of a process, &c. Discontinuance of possession of the course of a thing; as a discontinuance of possession, of a plea, of a plea, of a process, &c. Discontinuance

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#### Discords

maintain it. It is not necessary for that purpose to obtain the defendant's consent, but the plaintiff must

obtain the defendant's consent, but the plaintin must undertake to pay the costs.

Discords, dis'-kords (fr. discords), in Mus., a dissonant or inharmonious combination of sounds, so called in contradistinction to concord, the effects of which it is intended to sweeten and relieve. Some require to be introduced by certain preparatives, and to be succeeded or resolved by concords to which they have some reletion. Therefore, are sometimes intended to the contradiction of the contradiction have some relation. Discords are sometimes intentionally introduced into music, not for themselves alone, but to set off the concords by contrast and opposition. Their necessity in the composition of part music can-not be denied, as they not only improve the concords not be defined, is they not only improve the concords by opposition, but by causing a momentary distress to the ear, which remains unsatisfied and even uneasy until it hears something better, they give a stimulus to the attention, which would otherwise languish.

Discordant, dis-kord-ant.—All dissonant or inhar-

monious sounds, whether successive or simultaneous,

are thus called.

DISCOUNT, dis'-kownt (Sp. descontar), is an allowance made on a bill, or any other debt not yet become due, in consideration of present payment. It is usual in commercial dealings to allow for discount a sum equal to the interest on the debt from the time of payment to the time when it actually becomes due, which sum is deducted from the whole amount. This mode of calculation, though generally adopted, is not strictly correct; for it is evident that in this way the discounter receives more than he is actually entitled to. Thus, if a bill for £100 due twelve months hence be discounted at the rate of 5 per cent., the holder only receives a present payment of £:5, which, by being lent out at 5 per cent., will in twelve months only produce £4.15s.24d., which is the true discount on the bill. The person who, at the end of twelve months, receives £100 for an advance of £95, actually receives of interest £5.54.3d, per cent. The rate of discount varies according to the demand for money and the character or credit of the parties sub-scribing to the bill. The rate of discount upon good bills is usually from 3 to 4 per cent. When merchan-dise is purchased at a fixed term of credit, the discount allowed for payment before the expiry of that term is usually considerably above the current rate of interest, as the creditor is thus insured against the insolvency of the debtor. The depreciation in value of any fixed in-vestment is also called discount. Thus, if the market value of a railway share on which £100 had been paid is only £90, it is said to be at a discount of 10 per cent.

Discourse, dis-korse (Lat. discursus, from dis, and curro, I run), in Log., is an operation of the mind, whereby it passes or proceeds from one thing to another,—from a thing known to one unknown, and is thus synonymous with reasoning (which see). In Rhet, it is used in the same sense as an oration, a series of sentences and arguments arranged in a regular manner, with a view to carry conviction to the minds of those to whom it is addressed. It is also sometimes applied to the familiar talk or conversation

of an individual.

Discoveny, dis-kur'-e-re (Fr. découvrir, to discover), in Law, is the act of disclosing or revealing any matter. Till recently, the courts of common law had no power to compel a litigant before them to disclose any fact resting morely within his knowledge, or to discover any document in his power or possession. This defect has been remedied by recent enactments; and it is now competent for litigants, and they may be com-pelled to give evidence on the trial of such action, the credibility of which evidence to be decided by a jury. The judges may also, on application by either of the litigants, compel the opposite party to allow the applicant to inspect all documents in his custody or under his control relative to such action or proceeding.

DISCRETION, dis-kresh'-un (Lat. discretio, a separating), is that kind of prudence or discernment which enables a person to judge critically of what is correct enables a person to judge critically of what is correct and proper in certain circumstances, particularly as regards his own conduct. In Law, discretion is the power or faculty of discerning between right and wrong. "There are," say's Addison, "many more shining qualities in the mind of man, but there are mone so useful as discretion. It is this, indeed, which

#### Disease

gives a value to all the rest; which sets them at work in their proper times and places, and turns them to the advantage of the person who is possessed of them."
"Discretion is the perfection of reason, and a guidato us in all the duties of life." It "points out the noblest ends to us, and pursues the most proper and laudable methods of attaining them."

DISCUS, dis kus (Gr. diskos), a queit used by the ancients. It was generally a heavy circular piece of iron, sometimes perforated in the middle. The discus was not thrown at a mark, but the players endearoured who could throw it the farthest. The practice of throwing the discus is mentioned by Homer as being one of the sports at the funeral of Fatroclus. In the Cabinet of Antiquities at Paris, a discus is preserved which contains holes for the insertion of the thumb and fingers. In the well-known statue of Discobolus throwing the discus, in the British Museum, one of

the methods of using it may be seen.

Discussion, dis-kus'-shun (Lat. discutio), in Scots Law, denoted the doing diligence by a debtor against the principal creditor before coming against his cautioners or sureties, which was necessary to be done, unless the latter bound themselves as principals, or renounced the benefit of discussion. By the Mercanrenounced the benefit of discussion. By the Mercan-tile Law Amendment Act (19 & 20 Vict. c. 60), the right of discussion was abolished, and can now only be enjoyed by express stipulations, or in the case of cautioners bound prior to the passing of that act. Discussion, dis-kus'-shun (Lat. discussio, a shaking

off), in Lit., denotes the clear treating or handling of any particular point or problem, so as to shake off the difficulties with which it is embarrassed. Thus we say such a point was well discussed when it was properly treated and cleared up. (See CONVERSATION, DEBATE.)
DISCUTTENT, dis-ku'-te-ent (Lat. discutio, 1 destroy),

in Med., are remedies that discuss or disperse morbid

matter.

DISEASE diz-zeze' (Ang.-Sax.), is a departure from the state of health in which the due balance between the several parts or properties of the animal frame is maintained. It is "a changed condition or proportion, in function or structure, in one or more parts of the body." Diseases of function are deviations from a standard furnished by physiology, and diseases of structure a departure from a standard supplied by These, however, are usually combined; for there is seldom structural disease without some disor-der of function; and in many instances functional diseases are, or ultimately will be, accompanied by change of structure. The causes of disease may be either intrinsic, existing within the body, or independent of any obvious external influence; or they may be extrinsic, having their origin without the body. latter embrace all the external agencies that can operate either on body or mind; as temperature, air, food, poison, sensual impressions, and the like. Causes of disease, however, are often present without disease ensuing, some frames being less susceptible to particular causes of disease than others. Hence physicians distinguish two kinds of causes,—predisposing and exciting; the former being circumstances which so influence the functions or structures of the body as to render it unusually susceptible to the influence of particular exciting causes,-that is, of such circumparticular exciting causes,—that is, of such circumstances and agents as seem to more immediately operate in producing disease, especially when in a state of predisposition. The predisposing causes of disease are said to be,—(1) Debilitating influences; (2) excitement; (3) previous disease; (4) present disease; (5) hereditary constitution; (6) temperament; (7) age; (8) sex; (9) occupation. The exciting causes are so termed because the diseases seldom uplas their approximation products that have them present: make their appearance unless they have been present; and hence they have come to be regarded in the light of excitements to it. They are divided into cognizable and non-cognizable agents; the former comprehending those physical and mental influences of whose existence we can take cognizance independently of their operation in producing diseases the latter work their operation in producing disease; the latter such as clude our senses, and whose existence we only infer from their morbific effects. The cognizable agents are,—(1) Mechanical influences; (2) chemical influences; (3) ingesta; (4) bodily exertion; (5) mental emotion; (6) excessive evacuation; (7) suppressed or

#### Disfranchise

defective evacuation; (8) defective cleanliness, venti-lation, or drainage; (9) excesses and changes of tem-The noncognizable agents are endemic, epidemic, and infectious poisons, and are sometime spidemic, and infectious poisons, and are sometimes termed symotic (Gr. suma, a ferment). The classification and arrangement of diseases according to their external characters is termed Nosology; and that branch of science which more particularly regards the nature and progress of disease with a view to its cure, is called Pathology. (See NOSOLOGY, PATHOLOGY.)—Ref. Williams's Principles of Medicine.

DISPRANCEISE. (See FRANCHISE.)
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DISPRANCEISE. (See FRANCHISE.)
DISPRANCEISE.
DISPRANCEI In such a case it is necessary for the holder, or person in whose favour the bill is drawn, to give notice to the drawer and indorsers of the dishonour of the bill within a reasonable time, so as to preserve his recourse

against them.

DISINFECTANTS, dis-in-fek'-tänts (Lat. dis; Fr. in-fecter, to infect).—Disinfectants are substances which, by combining with deleterious gases or emanations, decompose them and render them harmless. powerful disinfectant known is chlorine, which is generally employed for this purpose in the form of chloride Another powerful disinfectant is permangaante of potash, which acts by yielding up an equivalent of nascent oxygen. It is known in commerce as "Condy a disinfecting fluid." Carbolic acid in solution is also a powerful means of getting rid of noxious rapours. To the constant use of these and other disinfectants by the different boards of health throughout the country may be attributed the great decrease of fever and other contagious disorders amongst the

DISINTEGRATION, dis-in-te-grai'-shun (Lat. dis, in-teger), the act of separating the integrant parts of a substance, as distinguished from decomposition, or the separation of constituent parts. Disintegration refers more particularly to the mechanical diffusion of a aubstance; decomposition, to the chemical division.

DISJUNCTIVE CONJUNCTION. (See CONJUNCTION.) DISJUNCTIVE PROPOSITION, dis-junk'-tiv (from Lat. sis, and jungo, I join), in Log., is a proposition com-pounded of two or more categorical propositions, so stated as to imply that one of them must be true. In such a case we proceed either by asserting the truth of one member of the division, and thence inferring the falsity of all the rest, which is called the modus ponens; or else by asserting the falsity of all the members but one, and hence inferring the truth of

that one, which is called the modus tollens.

DISLOCATION, dis-lo-kai'-shun (Lat. disloco, I put out of place), is the displacement out of their natural position of bones articulated together or forming a position of bones articulated together or forming a joint. It is usually occasioned by external violence; but may also, in some cases, result from diseases of the joint. Dislocation is either complete or incomplete; being incomplete when the articular surfaces remain partially in contact, and complete when there is an emire separation. It is simple when there is no wound and the skin remains unbroken; compound, when there is a mound by means of which the arterial is reis a wound, by means of which the external air may communicate with the joint. When, besides the dis-location, there are fractures of the bones or laceration of important organs, then it is termed a complicated dislocation. Dislocations are named either from the joint or from the bone that is chiefly displaced; and various terms are likewise employed to indicate the direction; as upward; downward, forward, backward, &c. Nearly all the bones of the human body are liable to displacement; but some are much more so than others; as those of the shoulder, hip, elbow, aukle, &c. Generally, those joints are the most liable to dislocation that admit of the greatest extent of motion. eation is in most cases easily observable; but in some eating it in mose cases easily conservate; but it some parts it is extremely difficult of detection. It is at-tended with loss of power and motion in the part, with more or less of swelling and pain, which is increused on moving the part; the putient feels sick and faint, and there is a sensation of numbness in the part. Disloca-Legre is a sensition of numoness in the part. Dislocations should be reduced as soon as possible after their Distribution, dispensation, dispensation, dispensation, dispensation, or the act of dealing difficult will be the operation. In a short time the out to different places or things. In Theol., it is

### Dispensation

patient recovers from the shock of the accident; the muscles, which were at first relaxed, resume their former rigidity, and render the reduction much more difficult. Dislocations are reduced by pulling gently, yet firmly and steadily, for some minutes, until the muscles are fatigued, and the head of the bone brought down below the level of the joint, when, by being gently lifted over the edge of the cocket, it falls into its place, upon the extending force being slightly re-laxed. The force required is often very considerable, and sometimes it is necessary to have recourse to a block and pulleys, in which case the body is securely fixed by proper bandages to a staple in the wall, or other sufficient support. In order to overcome the violent contraction of the muscles, it was sometimes necessary formerly to weaken the patient by blood-letting, emetics, &c.; but latterly chloroform has been most commonly resorted to for this purpose. After reduction it is necessary that the joint be kept in a state of perfect rest for some time, in order to allow the ruptured ligaments to unite; otherwise the accident will ever afterwards be liable to recur. When a dislocation has been left unreduced, the parts come to adapt themselves to their new situation; a new socket is formed for the head of the bone displaced, the old socket becoming absorbed or filled up. pound dislocations are generally attended with danger, and, when occurring in the large joints, are usually fatal, or require amputation. The displaced bones should be replaced without delay, and with as little violence or disturbance as possible, and the external wound closed. Sometimes, however, it is necessary to dilate the wound, in order to effect the reduction or to remove the detached pieces, if the end of the bone should have been shuttered. If there is surrounding inflammation, leeches should be applied to the part.

DISLOCATION, in Geol. (See FAULT.)
DISMES, dis'-mes (Lat. decima, or tenths), the name DISMES, dis-mes (Lat. decima, or tentins, the name given to the tenth part of the yearly value of all spiritual benefices anciently paid to the pope, who claimed this tithe of the tithes on the principle that the Jawish high priest took tithes of the Levites. This was frequently a cause of dissatisfaction to the English kings, and led to frequent disputes with the papal power. At the time of the Reformation these were annexed to the crown; and in the reign of Queen Anne the tenths and first-fruits were granted for the augmentation of poor livings, under the name of Queen Anne's Bounty. (See BOUNTY, QUEEN ANER'S.)
DISPATCHES, dis-patsh' ez (from Fr. dépêcher, to send

away), a term applied to a letter, or packet of letters, sent with expedition by a messenger express. It is mostly used when referring to a letter or letters on some affair of state or public concern. Papers containing information sent by some public officer to the government on public business are always called dis-

patches.

DISFRNSARY, dis-pen'-să-re (Lat. dispensarium, from dispendo, I distribute), denotes properly the shop or clace in which medicines are made up and distributed, but is now more commonly applied to a charitable institution for supplying medical advice and medicines gratuitously to the poor. These valuable institutions are only of recent origin, but they are now to be met with in every town of any importance either in this country or on the continent. Attached to each are country or on the continent. Attached to each are generally one or more physicians and surgeons, who, besides attending at the institution, visit at their own houses those that are too ill to attend personally. There is also a resident medical officer for dispensing the medicines. In most cases dispensaries are supported by voluntary contributions and a subscriber of a certain sum annually, or at once, becomes a governor, and is entitled to have one patient always on the books. "It would," says the English Cyclopædia, " be a great improvement in the principle of these institutions, if some contribution towards their support were required on the part of the poor themselves, which would enable the independent labourer, without asking charity, to procure the best advice for his sick family at a much cheaper rate than he can possibly do at present."

#### Dispensation

applied to the dealings of God with his creatures, particularly in some unusual or extraordinary way. In some cases it has reference to those providential ordinations by which the world was prepared for the gospels. Sometimes it has reference to the system of principles or rites enjoined by divine authority; as, the Mosaic dispensation, the Christian dispensation.

DISPENSATION, in ecclesiastical matters, is a relaxa-

tion of the law, or a dispensing with obedience to it in certain cases, granted by one who has the power to do so. The pope, as being above the law, claimed to have the power of dispensing with obedience to it in such the power of dispensing with obedience to it in such cases as he thought fit,—a power which was at one time frequently exercised, and led to great irregularities. By 25 Hen. VIII. c. 21, the power of granting dispensations as previously exercised by the pope was transferred to the archbishop of Cauterbury, but with the following important restrictions:—(1) That nothing be ropugnant to the law of God, for king or subject; (2) that nothing be against the statute 21 Hen. VIII. argainst pluralities of henefices. (3) nor against the against pluralities of benefices; (3) nor against the king's prerogative, or laws or statutes of the realm; and (4) that he 's limited to such as shall appear convenient and necessary, upon examination of the causes and qualities of the income. Hence it is that the architecture. bishop has authority to grant special licenses for the celebration of marriage, and for clergymen to hold

DISPENSATORY, dis-pen'-să-to-re, is a book containing the method of preparing the various kinds of medicine used in pharmacy. Almost every country in Europe, and many of the large cities, have their own dispensatories, which the apothecaries are bound to follow.

DISPERSION, dis-per-shin (Lat. dispergere, from dis, a particle denoting separation, and spargere, to scatter), the term applied to the separation of a ray of white light into its several component coloured parts by refraction, through the instrumentality of a prism. (See Prism.) When a ray of white light, or light from the sun, is allowed to enter a darkened room through a very small hole made for the purpose in the shutter by which the light is excluded from the apartment, and allowed to fall on a screen of white paper, conveniently fixed to receive it, it will cause a bright spot to appear on the screen, larger or smaller, in proportion to the distance of the screen from the window, and round or oval in shape, according as the ray falls on it at right angles to it, or at any angle which is not a right angle. If this ray be intercepted by placing one of the wedge-shaped edges, or angles formed by the meeting of any of the planes that compose the sides of the prism, in the bright track of light passing from the hole to the screen, it will be refracted or bent, and the white light will be dispersed, or, in other words, decomposed and separated into its various component parts of coloured light. We are made aware of this by the change in the position and appearance of the spectrum, as the bright spot of light that falls on the screen is called. Its new position is considerably above or below the original one, according to the way in which the ray of light enters the apartment, which shows that the ray, instead of proceeding to the screen in a straight line as before, has become bent out of that direction in its passage, and the spectrum, if previously round, has now become oval, or, if oval, considerably clongated in form, and, instead of looking like a spot of uniform bright appearance, the luminous space is covered with horizontal bands of colours arranged in the following order,—red, orange, yellow, green, blue, indigo, violet. These orange, yellow, green, blue, indigo, violet. These colours appear in the order of their refrangibility or capability of refraction, some being subject to a greater degree of refraction than others; that of blue being greater than that of yellow, and yellow greater than red. The breadths of the spaces occupied by the different colours are not in the same ratio to each other for every kind of prism; that is to say, the ratio of the spaces occupied by the colours differs according to the kind of glass of which the prism is made, and the length of the spectrum also differs. This is called the irrationality of dispersion. The best method of trying irrationality of dispersion. The best method of trying the experiment of dispersion of light is to allow the the experiment of dispersion of light is to allow the sun's rays to enter the apartment through a long and very narrow slit, instead of through a circular hole, which will give a spectrum of greater breadth. In Optics the term is often applied to the reflection or

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scattering of rays of light from any polished and reflecting surface, such as a steel mirror or looking-

DISPERSION OF MANKIND, is that event which took place at the building of the tower of Babel, in coasequence of the confusion of tongues.

DISTONDER, dis-spon'-de (Lat. di and spondee) Greek and Latin poetry is a double spondee, or a foot consisting of four long syllables; as, juramentum.

DISPOSITION, dis-po-zieh'-nn (Lat. dispositio), in

Log., is that operation of the mind whereby we put the ideas, propositions, or arguments which we have formed concerning a subject, in the order fittest to gain a clear knowledge of it, to retain it in the memory, or to explain it to others. In Rhet, it is the due placing or ranging the several parts of a speech or discourse. The logician is tied down to a certain prescribed form in his mode of reasoning, the rhetoriciae adopts that mode that seems most convenient for bim.
"A discourse," says Quintilian, "that wants disposition must necessarily be confused and without connection, liable to frequent tautologies and omissions, and, like one wandering in the dark, be conducted by chance rather than design." (See Oratora). Disposition likewise denotes a particular state of mind, distinguishing one individual from another, and inherent in the constitution.

DISPOSITION, in Scots Law, is a deed of conveyance by which property, either heritable or movable, is conveyed or transferred from one party to another.

DISPUTATION, dis-pu-tai'-shun (Lat. dis, and puts, I

DISPUTATION, dis-pu-tait-shan (Lat. dis, and puts, it hink), is a discussion or contest, either by word or writing, on some unsettled question. (See DRBATE.)
DISQUISITION, dis-kwe-rish'-in (Lat. dis, and quere, I seek), is a formal or systematic inquiry into the nature, kinds, or circumstances of any problem, question, or topic, by arguments, or by discussion of the facts and circumstances, in order to elucidate the truth, or to obtain clear notions regarding it.
DISRUPTION, dis-rup'-tshan (Lat. dis. and runnes. I

Disturritor, dis-rup'-tshua (Lat. dir, and ramps, I break), in the Eccl. Hist. of Scotland is applied to that act by which upwards of four hundred ministers of the established church left their churches and manses, in 1843, in vindication of their principles, and formed themselves into what has since been known

as the Free Church. (See FREE CHURCH.)

DISSECTION, dis-sek'-shun (Lat. dis, and seco, I out), is applied to the cutting or dividing of the different

parts of the body in anatomy. (See ANATOMY.)

Dissessing a man of his laud or estate, or interrupting his seisin. (See Shisin.)

Dissenters, dissenters (Lat. dis, and sentio, I think), in Eccl. Hist., is the general name applied to all the religious sects in this country that different the established church, in doctrine, discipline, or mode of worship. The Roman Catholics and or mode of worship. The Roman Catholies and Jews, however, are not usually classed with dissenters. The origin of Protestant dissent from the Church of England is usually traced to the reign of Edward VI., when, by the Act of Uniformity, passed in that reign, dissent from the worship and ceremonies of the established church was rendered a penal offence. Dissenters became much more numerous in the reign of Elizabeth, and from their professing extraordinary purity in worship and conduct, they received the name of Puritans. During that and several of the succeeding reigns, a variety of laws were passed for the re-pression of dissent, of the most rigorous and oppressive character. During the rebellion the laws against Protestant dissenters were repealed; but they were revived at the Restoration, and the parliament of Charles II. proceeded to enforce, systematically, by new measures of rigour, the principle of universal connew measures of rigour, the principle of universal con-formity to the established church. By the Act of Uniformity (13 & 14 Car. II. o. 4), it was enacted that the Book of Common Prayer, as then recently revised, should be used in every parish church, and other place of public worship; and that every schoolmaster and person instructing youth should subscribe an acknow-mathematic declarate that he would conform to the

and the two Conventicle Adis, in 1864 and 1670, made it penal for five persons, in addition to the occupiers of a house, to assemble for religious worship. In 1665, the Five-mile Act imposed a penalty of £40 on every Nouconformist minister who came within five miles of any corporate town. In 1673, the Test Act excluded dissenters from all civil offices and military commands. The revolution of 1689 unhered in an era of more liberal measures for the dissenters. The Act of Toleration (1 Will. & Mary, c. 18) bestowed on Protestant dissenters full liberty of worship upon paying tithes and other dues, taking the oaths of allegiance and supremacy, and certifying their places of worship to the bishops or justices of the peace; dissenting ministers being also required to sign thirty-five and a half of the Articles of the established church. From that time, and the two Conventicle Acts, in 1664 and 1670, made it Articles of the established church. From that time, various statutes have been passed, extending a greater degree of freedom to dissenters; and in 1828 the Test and Corporation acts were ubolished. The oldest of the dissenting bodies are the Presbyterians, Independents, Baptists, and Quakers. About the middle of list century sprang up the Methodists, followers of Wesley and Whitfield, who soon became very numerous, but are now divided into a number of different sects. According to the census of 1851, which, however, is confessedly imperfect, there were, in all. 34,467 places of worship, having, in all, 10,212,563 sittings, in England and Walley; of which 20,390, with 4,894,648 sittings, belonged to the several bodies of dissenters, including Roman Catholics and Jews. Of these, 161 places of worship, with 85,812 sittings, be-Articles of the established church. From that time, these, 161 places of worship, with \$3,812 sittings, belonged to the Presbyterians; 3,244, with 1,067,760 sittings, to the Independents; 2,789, with 752,313 sittings, to the Baptists; 371, with 91,539 sittings, to sittings, to the Baptists; 371, with 91,599 sittings, to the Quakers; 1,194, with 2,444,976 sittings, to the various sections of Methodists; 570, with 186,111 sittings, to the Roman Catholics; 229, with 68,554 sittings, to the Unitarians; 222, with 30,783 sittings, to the Latter-Day Saints; 32, with 7,437 sittings, to the Catholic and Apostolic Church; and 53, with 8,438 sittings, to the Jews. The most numerous body of dissenters in Scotland, is the Free Church, which second from the established church in 1843 and is people. ceded from the established church in 1843, and is nearly, if not quite, as numerous as the establishment. They, however, disclaim the name of dissenters, as they maintain that they do not dissent from the principles of the Church of Scotland, but came out in consequence of their adherence to them. Next to the Free, is what is termed the United Presbyterian Church, which originated in the secession of a considerable body of ministers and laymen from the established church in 1732. In 1847 this body became united with the Relief Church, a somewhat later secession, under the designation of the United Presbyterian Church. According to the census of 1851, the total number of places of worship in Scotland was 3,395, with 1,834,805 sittings; of which 1,183 places of worship and 77,089 sittings belonged to the established church. Of the rest, 889, with 485,355 sittings, belonged to the Free Church; 465, with 288,100 sittings, to the United Presbyterian; 192, with 76,342 sittings, to the Independents; 134, with 40,022 sittings, to the Episcopalians; 117, with 52,766 sittings, to the Roman Catholics; and 119, with 52,769 sittings, to the noman cannoies; and 110, with 26,086 sittings, to the Baptists. The proportion of unoccupied sittings is largest in the established, and smallest in the Free Church. Dissent, at least as based upon any material point, is much less prevalent in Scotland than in England; the differences between the two principal sects of dissenters and the catablished change haing mainly regarding the connection between church being mainly regarding the connection between church and state. In Freland, exclusive of the Roman Catholics, the principal dissenters are the Presbyterians, who are mostly confined to the province of Ulster. A particular account of the different sects referred to in this article will be given under their own

heads in other parts of this work.

DISSIDENTS, dis-se-dents (Lat. dissidee, 1 disagree), is a term synonymous with our dissenters, and the term usually applied to certain sects in Poland who dissented from the Roman Catholic church, but who were yet allowed the free exercise of their own worship. Even during the lifetime of Luther, Protestant principles had made such progress in Poland that half the senate, and more than half of the nobility, had the senate, and more than half of the nobility, had adopted the new faith. The compact of Sandomir in garded as the termination of the Christmas sports.

1570 united the Lutherana, Calvinists, and Bohemian Brethren into one body (a union which had also a political tendency); and by the religious peace sworn to by the king in 1573, they obtained the same rights with the Roman Catholics. From dissensions among themselves, however, and the increasing power of the Catholic church, the dissidents by degrees lost most of their privileges, and in 1717 and 1718 they were deprived of their right of voting in the diet. In 1736, at the diet of Pacification an old statute was revived. the diet of Pacification, an old statute was revived. which required that every king be of the Catholic church. After the accession of the last king, Stanilaus Poniatowski, the dissidents brought their grievances before the diet in 1766, and were supported by Russia, Prussia, and England; Russia in particular improved the opportunity to extend her influence in Poland, and suggested by the Americanian in brigging Poland, and succeeded by her mediation in bringing about a new convention in 1767, by which they were again placed on an equal footing with the Roman Catholics; the war, however, against the confederates breaking out, and the kingdom being dismembered, with the adjustment of the confederates breaking out, and the kingdom being dismembered. little was effected until 1775, when the dissidents re-gained all their privileges, except the right of being cleated senators or ministers of state. Later events in that country have confirmed to the dissidents equal rights with the Roman Catholics. They include Lu-therans, Calvinists, Greeks, and Arminians, but exclude Anabaptists, Socinians, and Quakers.

DISSOLUTION, dis-so-lu'-shun (Lat. dissolutio, from dis, and solvo, I set free), a term variously applied, but in its commonest and most general sense implying the separation of the parts of a body which in the natural condition are united. The state of being lique-fled by heat or moisture is termed dissolution: thus, ice is changed from a solid into a fluid state by heat; nee is changed from a soild into a fluid state by heat; metals, again, can undergo dissolution by the action of an acid menstruum. The separation of the soul from the body is termed dissolution, or, more generally, death. (See Dearm.) Dissolution of the blood, in Med., denotes that condition of the vital fluid in which it does not readily coagulate on its cooling, out of the body, as in the case of malignant fever. Shakspere body, as in the case of malignant fever. Shakspere gives a fair illustration of the application of the term:—
"I am as subject to heat as butter; a man of continual dissolution and thaw."

DISSOLUTION OF MARRIAGE. (See DIVORCE.)
DISSOLUTION OF PARLIAMENT may be effected in three ways;—1. by the will of the sovereign, expressed either in person or by representation; 2. by the demise of the sovereign,—in which case, however, it is to continue in existence for six months after the demise, unless sooner proround or dissolved by the successor; and 3. by length of time, i.e. seven years. (See Pau-LIAMENT.)

DISSOLVING VIEWS, diz-zol'-ving (Lat. dissolvo), pictures painted upon glass, and exhibited by means of the magic lantern (which see). After one picture has been exhibited, by removing the founs, or lessening the light, the effect is rendered less distinct; then by means of another magic lautern, or a lens, a fresh slide is gradually introduced, so that one picture blends with another almost unconsciously to the spectator. The exhibition of dissolving views is usually accompanied with music, and the tunes played become louder as the light increases, which is always when the new picture gains its full distinctness.

DISSONANCE, dis'-so-mins (Fr.), in Mus., a term used to denote the effect produced from the unison of two sounds not in concordance with each other. and sixths were anciently considered as dissonances; in fact, every chord except the perfect concord is dissonant. Formerly there was an unlimited number of dissonances, but they are at present reduced to a comparatively small number.

DISSYLLABLE, dis'-sil-id-bl (Gr. dissullabos), in Gram, is a word of two syllables; as, goodness, brauty, DISTAYP, dis'-tiff (Sax. distaf), the staff of a spinning-wheel, to which a bunch of flax or tow is attached,

and from which the thread is drawn. Before the introduction of machinery for the purpose of spinning threads, the distaff was much used, but it is now,

### Distance

Herrick, in his "Hesperides," thus quaintly describes he boisterous mirth that marked this season:—

" Partly worke, and partly playe, You must on St. Distaff Day. From the plough soone free your teame, Then come home and fother them. If the maides a spinning goe, Burne the flax and fire the tow; Scorch their plackets, but bewars That ye singe no maiden's baire. Bring in pales of water, then Let the maides bewash the men. Give St. Distaff all the right, Then bid Christmas-sport good night. And next morrow, every one To his own vocation."

DISTANCE, dis'-tons (Lat. distare), in Paint., an expression used to denote the utmost extent to which the nower of vision can reach, or the limit of view. Extreme distance is the visible horizon of the observer, in which the land and sky appear to meet; and middle distance is that part which lies midway between the distance of the picture and the foreground. Distance, in Horse-racing, is a length of 249 yards

from the winning-post. At this point is a post with a gallery running round it, capable of helding three or four persons. It is called the distance-post. When a race is run, a man is stationed at the distance-post, and is provided with a small red flag, with which he can communicate with another man at the winning-post. When the winner passes, the man at the winning-post lowers his flag, and the man at the distance-post lowers his flag at the same time. If any horse has not then arrived at the distance-post, he is said to be "distanced," and incurs penalties accordingly.

DISTEMPRE, dis-tem'-per (Fr. détrempe), in Paint., the name given to the colouring matter used in scenepainting, and for printing and staining paper-hangings. A mixture is made of whitening and coarse size, in the proportion of ten parts of the former to one of the latter, to which the required colour is added when it has been diluted with a little water, and brought to a consistency resembling cream. Distemper colours dry very rapidly, and should be slightly warmed before they are used. This method is sometimes used in colouring the walls of houses externally, and the interior of rooms.

DISTEMPER, a disease to which young dogs are liable. It is supposed to have been derived from France, and is considered to be a typhoid inflammation ing the upper air-passages. It closely resembles the strangles of young horses, and the scarlatina and suchlike diseases to which young children are liable. The disease is contagious, occurs generally only once in a lifetime, runs a definite course, and is accompanied by low fever and debility. Careful attention to nursing and diet constitutes the most successful treatment of this disorder. A dog with the distemper is easily recognized. The eyes become red, weak, and warecognized. The eyes become red, weak, and watery; the nose hot and dry; any movement in the nir excites a cough or snezze; and there is a general dulness, fever, and loss of appetite. The running from the nose, as the disease proceeds, becomes, after some days or weeks, mucous or purulent, londing the eyes and obstructing the nostrils. It then lodges in the bronchial tubes, preventing the free access of air and the purification of the blood. All dogs are subject to distemper; but highly-bred, delicate, and fancy dogs are most liable to the disease, and the mortality amongst them is the greatest. In the cure of distemper all irritating and reducing remedies must be avoided. If the stomach is overloaded, it should be relieved by a mild emetic; and if no effect is proavoided. It has stomed is overloade, it should be relieved by a mild emetic; and if no effect is produced by the dose, it should be repeated in twenty minutes. To ward off distemper, young dogs should be very liberally and nutritiously fed. In such cases, in spite of all cure, if they are attacked with distemper, they are almost certain to pass over it very favourably. Nothing proves the prophylactic effect of pure air and voluntary exercise more than that young hounds at their walks are seldom attacked by distemper. Dogs are liable to distamper more than once; but the repetition is of unusual occurrence. Inflammation of the lungs is often the consequence of distemper; and the bowels

### Distilled Water

are always more or less affected by diarrhos and dysenteric discharges, often indicating ulceration of the intestinal canal. Protracted cases of distension are sometimes attended by a pustular eruption on the chest and abdomen, accompanied by an hepatic affec-tion usually called "the yellow disease," from its giving the whole surface of the skin a yellowish colour. The symptoms in such cases are generally fatal. Dis-temper is communicated by contact of the diseased catarrhal secretion. Inoculation has been proposed as a mitigation of the disease; but it has been proved by Mr. Blaine that vaccination is inefficacious. (See Blaine's Cunine Pathology, and Rural Sports, part iv.

Chap. iv.—Diseases of Dogs.)

DISTICE, dis'-tik (Gr. distiction, consisting of two rows), a couple of verses or poetic lines making complete sense. The term is principally applied to the lexameters and pentameters used among the Romans, especially by Orid and Catulius. Among the Greeks and Romans the distich was used as a vehicle for the expression of definite sentiments, and especially for epigram. Goethe and Schiller, together with other great poets of Germany, have, in later years, shown a great predilection for the distich, and great skill in using it.

DISTILLATION, dis-til-lai'-shun (Lat. distillo, from dis, and stillo, I drop), the process of evaporating a fluid by means of heat, and afterwards condensing it into a liquid. Its object is to separate one substance from others with which it may be mixed; and the possibility as to whether a substance can be distilled depends upon the temperature at which it evaporates. In chemistry, distillation is performed by means of a retort or flask, and a receiver. It is, however, carried on in the most extensive scale for the production or ardent spirits. It is not known when distilled spirits were first made; but the discovery is usually attributed. to the alchemists, who called it aqua vita. Originally spirits were distilled from wine; hence the common name of alcohol—spirits of wine. In the production of ardent spirits, there are two distinct operations: first, the conversion of some vegetable substance into alcohol; and second, the separation of the alcohol from the substances with which it is mixed. The latter operation is, properly speaking, distillation; although, in ordinary language, both are classed under that head. Sugar, and starch, which is easily converted into sugar, are the chief sources of alcohol. By the action of fermentation, sugar is converted into alcohol and cartermentation, sugar is converted into account and car-bonic acid; so that all substances containing sugar or starch will yield spirits after distillation. After the wash, or alcoholic mixture, has been formed, the pro-cess is continued in a still or alembic. When heated to 176°, the alcohol, mixed with steam, evaporates, and, passing through the worm of the still, is cooled and condensed, and trickles out in a liquid form into a receiver. Anhydrous alcohol cannot be obtained by distillation alone. Spirits of wine, or rectified spirit, contains as much as 25 per cent. of water. Taking water as 1000, the specific gravity of alcohol is 793. Proof spirit is the legal standard of strength established by the excise of Great Britain: its specific gravity is the exoise of Great Britain: its specific gravity is 918°6; it contains about equal parts of water and alcohol. The principal spirits obtained by distillation are,—brandy from wine, rum from molasses, and whiskey, gin, &c., from corn or malt. Among the Dutch the corn spirit is flavoured with juniper-leaves; hence the names gin, genera, from the French genierer, juniper. The Germans distil spirit from potatoes.

DISTILLATION, DESTRUCTIVE, the process of heating vegetable and animal substances in closed vessels to such a temperature as to decompose them. The results of the decomposition are collected and obtained in various ways. When coal is subjected to destructive various ways. When coal is subjected to destructive distillation, the results are gas, coke, tar, naphths, &c.; when wood is thus distilled, the results are wood-spirit, when wood is thus distilled, the results are wood-spirit, when we would be a subjected to destructive and the subject of destructive and the subject of the subject of

when wood is thus distilled, the results are wood-spirit, wood-vinegar, charcoal, &c. The results of destructive distillation are mostly obtained by condensation.

DISTILLED WATER, distild:—When water is subjected to the process of distillation, the result is abuild without odour or colour, with an insipid taste. In this form it is called distilled water, and, if evaporated to dryness, ought to leave no residue. Distilled water, in its purest possible form, is absolutely necessary to the chemis in his laboratory. (See WARER.)

### Distilled Waters

DISTILLED WATERS.—When aromatic plants are distilled along with water, the combined results are usually called distilled waters. Rose-water and larenderwater are examples of common occurrence.

water are examples of common occurrence.

DISTILLERY, dis-tile-eve, the building or works where distillation is carried on. (See DISTILLATION, STILL.)

DISTORTION, dis-tole-ekan (Lat. distortio, from dis-lorgueo, I twist), in Surg., is a permanent deviation from the natural shape or position of the body, producing visible deformity. Distortions may arise from various causes. They generally occur after birth, and thus differ from deformities, which are for the most part congenital. Distortions are frequently occasioned by affections of the muscles or nerves. It is well known that every movable part of the body is furnished with two sets of muscles acting in contrary directions, by two sets of muscles acting in contrary directions, by means of which it is not only moved, but also retained in its natural position. Hence it is evident that if, by means of any injury to one of the sets of muscles, means of any injury to one of the sets of muscles, or of the nerves communicating with them, their contractility is destroyed or impaired, the part can no longer be maintained in its natural position, but will be drawn towards the antagonistic muscles. In this way various kinds of lameness, wry neck, squinting, &c., are produced. The most common cause of distortion, however, is disease of the bones. These are sometimes deficient in the earthy matter which gives them hardness and rigidity, and thus are incapable of sunhardness and rigidity, and thus are incapable of sup-porting the weight of the parts which they are designed to bear, or of sustaining the muscular action, without becoming bent and distorted. From this arises the disease known as rickets (which see). The distortion known as the lateral curvature of the spine arises from weakness in the vertebral muscles, inducing a habit of weakness in the vertebrai muscles, inducing a habit of resting the weight of the body more on one side than the other. Unlike rickets, which commence early, this does not usually make its sppearance before the tenth year, and is most commonly found among slender and delicate females in the higher and middle ranks of life. It is generally occasioned by too much confine-ment and externit occasioned by too much confinement and restraint, and is best got rid of by plenty of free exercise of the limbs in the open sir. Angular curvature of the spine differs entirely from the above, and is occasioned for the most part, by ulceration of the body of one or more of the vertebræ. The support in front being thus lost, the spine is bent sharply forwards, and one or more of the spinous processes project behind. Perfect rest in the horizontal position, issues and setons in the neighbourhood of the diseased bone, and attention to the general health, is the treatment to be adopted in this case. Diseases of a similar kind frequently occur in the bones and joints of other parts of the body, and require similar treatment. Distortions may also arise from a variety of other causes; as rheumatism, gout, burns, and various chronic and local affections; but these come more properly for consideration under their own heads.

DISTORTION, in Phot., a term applied to the unnatural increase in size of certain parts of the picture. Distortion arises from several causes; such as using too small a lens; not using a sufficiently large diaphragm

small a lens; not using a sufficiently large disphragm or stop; by approaching the object too closely; or by the lens itself being improperly connected.

DISTRESS, dis-trees' (Lat. districtio), in Law, is the taking of a personal chattel out of the possession of a wrong-doer into the custody of the party injured, to procure satisfaction for the wrong committed. Districts of the procure of the form of the procure of the procure of the form of the procure of the form of the procure of the pro tresses are either for some duty omitted, some default, or nonfeasance; or they are in respect of some wrongful act done by the distraince. The most usual injury for which a distress is taken, is that of non-payment of rent. A lord may also distrain of common right for neglect to do suit to the lord's court, or other certain persons service. Distresses may also be taken where a man fluds beasts of a stranger wandering in his grounds doing him hurt or damage; in which case the owner of the soil may distrain them while they are upon his grounds, till satisfaction be made to him for the injury he has sustained. As a general rule, all chattels personal are liable to be distrained, unless

## Distribution of Animals

generally speaking, whatever goods or chattels the landlord finds upon the premises, whether they, in fact, belong to the tenant or a stranger, are distrainable by him for rent, the stranger having his remedy by action on the case against the tenant. Fixtures, however, and things in the custody of the law, money (except in certain cases), and goods of a perishable nature, as fruits, milk, &c., are exempt from distraint; as are also beasts of the plough, and the instruments of a man's trade or profession, if there be sufficient property on the premises otherwise. A distress cannot be made in the night except in the case of oattle damage forward, as otherwise they might escape. A landlord may distrain within six calendar months after the determination of the lease, provided his own title or interest, as well as the tenant's possession, continue at the time of the distress. In general the distress must be made on the premises; but goods fraudulently or clandestinely carried off may be distrained within thirty days thereafter, unless they have been bond fide sold for a valuable consideration. The landlord may not break open a house of which the rent is in arrear to make a distress; house of which the frent is in arrear to mean a minute on but when he is in the house, he may break open an inner door. Distresses must be proportioned to the thing distrained for, and an inventory of as many goods as are judged sufficient to cover the rent and expenses, must be made and served personally on the tenant, together with a notice of the fact of the distress having been made, and the time when the rent and charges must be paid, or the goods replevied. The landlord cannot seil the goods distrained before the expiry of tive days; and prior to the sale, an appraisement must be made by two sworn appraisers of the value of the goods. After the sale, it there be any overplus after payment of the rent and expenses, it is to be handed over to the tenant. Cattle cannot be lawfully distrained if found trespassing through default of the occupier of the land by neglecting to repair his fences or to shut his gates, unless the owner of the cattle suffer them to remain after receiving notice of their trespass; neither can they be distrained if once off the land upon which

they have been trespassing.
DISTRIBUTION, dis-trib-w-shun (Lat. distribuo, I distribute), is the placing particular things in the places or compartments which have been already prepared to receive them. In Log., a term is said to be distributed when it is employed in its full extent, so as to comprehend everything to which it is applicable; to be spread, as it were, over the whole class, and applied to each object individually, not to all collectively. When a common term denotes fewer than all the objects of a class, it is said to be taken particularly, or to be undis-

DISTRIBUTION OF ANIMALS .- Certain tribes, genera, and species of animals are peculiar to certain portions of the globe. In some respects the distribution of animals resembles that of plants, and both these are dependent on meteorology. Thus, where vegeare dependent on meteorology. Thus, where vege-tation is most abundant, animal life is most prolific. Plants are stimulated in their growth by heat and moisture; and as in tropical climates the heat and moisture are greatest, there also the animal formations are most abundant. As they decrease in a direction from the equator to the poles in perhaps a similar proportion, so do animals decrease, not only in the size of individuals, but in the number of species. This law affects vertebrate and invertebrate animals which inhabit the land, but is reversed in the case of those animals of higher organization which inhabit the sea. The latter are found to increase in a direction from the equator to the poles. The distribution of animals is also limited in many cases by the intervention of seas or lofty ranges of mountains; but animals, like plants, are salapted to particular climatic conditions, and, like them, are subject to fixed laws. Man can endure the scorehing heat of the tropic zone and the intense cold of the Arctic circle. The dog, however, is the only vertebrate animal that can accompany him. Many animals cannot exist except in a determined climate, The iton and tiger would soon die in an arctic climate, and a polar bear could not exist at the tropics. In specially protected or exempted, as are all animals and a polar hear could not exist at the tropics. In fere nature; whatever is in the personal use or occupation of any man at the time; and things delivered portion as the observer recedes from the coast. Certoa person exercising a public trade, to be carried, tain species of animals remain shut up in a chain of wrought, or managed in the ways if his trade. But, mountains, and are unable to move to other similar

# Distribution of Wealth

localities; for, as the temperature decreases with the elevation, before they could pass to another mountain-ridge they would have to traverse a region whose temperature would be much higher than that to which they are accustomed. The Himslayan Mountains thus present to the ascending traveller a succession of species similar to that met with in travelling from Brazil to Labrador, or from India to Kamtechatka.—

BISTRIBUTION OF WEALTH. (See WRALTH, DISTRIBUTION OF WEALTH.

BUTTON OR )

DISTRIBUTIONS, STATUTE OF, is the name given to statute 22 & 23 Car. II. c. 10, explained by 29 Car. II. c. 3, which regulates in England the division of the c. 3, which regulates in England the division of the estate of a person dying intestate. It enacts, that after the expiration of one full year from the death of the intestate, one-third of the surplus of his personal estate shall go to the widow, and the remainder be divided in equal proportions among the children. If there be no children, then the widow is to have one half, and the other half to be divided among the nearest of kin; if no widow, then the whole to go to the children; and if neither widow nor children, then the whole to

be distributed among the next of kin.

District, dis'-trikt (Lat. districtus), in general language, a limited extent of country, or a circuit within which right or authority may be exercised. Military districts are portions of Great Britain which are set apart in order to assist military command. and organization. Each district has its head-quarters at some particular town. The northern district of England has its head-quarters at Rotherham, the western at Plymouth, and the south-western at Ports-mouth. London is the head-quarters of the rest of

England, which is considered to be a military district, Edinburgh is the head-quarters of the Scottish district; and Ireland is divided into five districts, the headquarters of which are Dublin, Cork, Limerick, Athlone, and Armagh.

and Armaga.

Diren, dith (Sax. dic), in Agr., a long trench cut by the sides of roads and fields, to carry off the surplus water that may fall on the surface. When land is drained by means of pipes, these discharge themselves into a ditch dug along the lowest side of the field. In flat low countries the fields are often separated by broad ditches, without any other kind of fence whatever. The banks of these are sometimes planted, and the field is entered through a gate placed on a bridge thrown across the ditch, and wide enough to admit of the passage of a cart. Where it is practica-ble to do so, the earth taken from the ditch is formed into a bank and planted with thorns, which in a few years form an impenetrable fence.

years form an impresentation rate.

Dirox, in Mil., a broad and deep trench surrounding
the rampart of any fortification. The rampart is generally formed of earth taken out of the ditch. The main ditch of a fortress is about 120 feet wide and 12 feet below the level of the ground. The sides are generally secured with revetments of masoury. The side immediately below the parapet is called the scarp of the ditch, and the side opposite to the scarp is called the

counterscarp.

DITHIONIC ACID, dith e-on'-ik, in Chem., SoOs: also called hyposulphuric acid, - the second of the thionic

called hyposulphuric acid,—the second of the thionic series of sulphuric and oxygen compounds, all of which contain five equivalents of the latter. It unites with transforming salts, generally known as hyposulphutes, none of which are of any importance.

DITHYRAMBUS, dith-e-rdm'-bus (Gr.), a surname of Bacchus. In ancient verse, the term was used to designate a species of lyric poetry, more particularly cultivated at Athens. It was distinguished by its wildness and enthusiasm, but in later years it degenerated into mere bombast. Originally the dithyrambus was a hymn sung in honour of the deity after degenerated into mere bombast. Originally the dithyrambus was a hymn sung in honour of the deity after
which it was named. It was generally sung by a
chorus of fifty, who danced in a circle as they sang
round the blazing altar of the god. The song was at
first rudely accompanied by flute-music, but afterwards Arion invented a regular choral form for it.

Dirro, distric (Lat. dictus, said), a term in common
use, signifying aforesaid, or the same thing. The derivation of the term is more directly from the Italian
defice, it is need to save repetition and is often con-

detto; it is used to save repetition, and is often contracted to the form de.

Divers

DITTY, dit'-te, a term derived from the Latin dictum-It was originally spelt dittie, and implied in its primi-tive sense a saying or sentence. In modern times, however, it has been used to signify a short poem or

DIURETICS, di-u-ret'-iks (Gr. diouretikos), in Meda-those agents which have the power of augmenting the secretion of urine. Their action is beneficial whenever the system is troubled with an excess of fluids or of salts and nitrogenous substances derived from effete salts and nitrogenous substances derived from effectissues. There are some diureties, such as nitrate of potash, which act primarily upon the urinary organs; others, as the mercurials, which act primarily on the absorbents and secondarily on the kidneys; and others again which act directly on the urinary organs. Stimulant and tonic medicines have generally a diuretic action in cases of debility. As in the case of the function of perspiration (see Diaprometros), so in that of the secretion of urine, many external circumstances influence its due performance. These two erreat functions seem to supply the place of, and alterstances influence its due performance. These two great functions seem to supply the place of, and alter-nate with, each other, and the circumstances which favour the one will generally interfere with the other. To secure the proper action of a disphoretic, the skin of the patient must be kept warm: but, in employing a diuretic, it is necessary to keep the skin cool.

Divan, div-an', an Arabic or Persian word, originally signifying a register of names and accounts, but more

signifying a register of names and accounts, our more generally employed to designate a court of justice or supreme judicial tribunal. The word, however, is very variously applied. Among the Persians, a collection of poems or songs by one and the same author is called a divan. The state or reception rooms in palaces and the prints because of the rich gitterns of Constantithe private house of the rich citizens of Constanti-nople are also called divens. Among Europeans the term is more generally applied to a kind of soft, probably from such being used in the divens of the orientals. Cigar divans are establishments fitted up with couches, &c., where, by paying a fee, visitors can smoke, read the periodicals of the day, and be pro-

vided with coffee and other refreshments.

DIVELON-THE-NECK, div.el, an instrument of tor-ture, employed against the Lollards. Fox, in his "Acts and Monuments," thus describes it:—"Certain strait irons, called the divel-on-his-neck, being after an horrible sort devised, straitening and winching in the neck of a man with his legs together, in such sort as the more he stirreth in it the straiter it presseth him, so that within three or four bours it breaketh and crusheth a man's back and body in pieces."

Diverging Lives, di-eerf-ing (Lat. diverge, I tend from), a term employed in Math. and Opt. to denote those lines which separate or recede from one another after proceeding originally from the same point. Diverging lines are opposed to converging lines. a convex lens renders the rays of light convergent, while a concave lens renders them divergent. In Math., a diverging series is one of which the terms in-

crease more and more the further it is continued.

Divers, di-verz (Mergus).—The divers closely resemble the grebes; indeed, the chief point of difference consists in the former having palmated feet. They have a strong, straight, rather compressed, pointed bill, about as long as the head; a short rounded tail; short wings; their legs placed far back, and toes completely webbed. They fly well, and, as divers, are remarkably expert. They measure usually from two and a half feet to three feet in length, and are essentially inhabitants of high northern istitudes, visiting our shores in the autum, remaining through the winter, and quitting us in the spring to seek their northern breading-stations. The great northern diver (Colymbus glacialis) is the largest of the tribe. It measures full three feet in length, and four feet six inches in breadth. The bill, which is black and very strong, measures four inches from the top to the corners of the meuth. The head and neck are black, shaded with purple and green. At the back of the neck there is a white crescent-shaped band, marked with black oblong strokes pointing downwards. The breast and underside of the body are white; the back, wing-coverts, and scapulars, are black, thickly dotted with white. Speaking of this bird, Dr. Richardson says, "It can swim with great swiftness; and to a very considerable distance, under water; and when it feet in length, and are essentially inhabitants of high

comes to the surface, it reidem exposes more than the neck. It takes wing with difficulty, dies heavily, though swiftly, and frequently in a sixele round those who intrude on its haunts. Its load and very melancholy cry, like the howing of the wolf, and at times like the distant screams of a man in distress, is said to portend rain. Its flesh is dark, trough, and suppaistable." The red-throated diver (Cospuden septentrionals) is smaller than the great northern, and lighter coloured. In habitat, however, they exactly agree.

Diving the great northern, and lighter coloured. In habitat, however, they exactly agree.

Diving the great northern, and lighter coloured and the great northern would be a short, light, pleaning supposition, vocal or instrumental, written in a style calculated to engage the popular ear. Divinguing, div-e-dend (from Lat. divide, I separate), in Com., is applied either to the money which is divided amongst the oreditors of a bankrupt out of his estate, or to the annual interest payable upon the national

or to the annual interest payable upon the national

debt and other public funds.

Divination, dic'dn-a'-shin (Lat. divinatio), a term applied generally to the various arts used in all ages for the discovery of things, secret or future, in a supernatural way. In all ages, and among all nations, there has been exhibited a strange feeling of curiosity which has prompted mankind to look forward into tuturity with the intention of penetrating its mysteries. Ori-ginally, these speculations were made by deep thought, by comparing the past with the present, and by drawing careful inferences as to the probable course of events. The human mind did not, however, stop at this point, for the strong desire to look into futurity led mankind to see presses of events in things be-tween which and the object of anxiety no connection existed whatever. Every department of nature began to be consulted, as furnishing good or bad omens of human destiny. The feeling among ancient nations was, that if gods really existed, they cared for men; and if they cared for men, it was only natural that they should send them signs of their will. From this sentiment divination began to form a regular science, intimately allied to religion, and furnished with particular laws and regulations, differing in character according to the degree of civilization attained by the country in which it was established. Among the ancient Greeks and Romans, divination was practised with great enthusiasm. In the most trivial matters with great enthusiasm. In the most trivial matters of every-day life they saw something that had reference to the future, or destiny, while their auguries and oracles formed the higher class of divination. The different systems of divination employed by the ancients are very numerous. Aëromancy, or divining by the air; Arithmomancy, or divining by means of numbers; Capnomancy, by the smoke of sacrifices; Chiromancy, by the lines in the palms of the hands; Hydromancy, by water; Pyromancy, by fire, &c., constitute only a few of the many methods in vogue. A number of superstitious customs in use at the pre-A number of superstitious customs in use at the present day evidently owe their origin to ancient forms of divination. Lucky and unlucky days were once considered very important matters of consideration; and even now, in commencing any undertaking, Friday is avoided by many persons in all ranks of society. It is also generally conceived that a wedding in May is unlucky. A large number of omens are associated with lucky. A large number of omens are associated with what first happens to any one about to undertake anything. To stamble is always considered unlucky; various lucky and unlucky signs are deduced from the number of certain hirds-generally mappies—seen. A hare excessing the path is deemed unlucky; so is an old woman. Priests were formerly considered unlucky, and the hunters of old, when they met a priest, coupled up their hounds and retired; there was no sport for them on that day. Many superstitions of this kind are associated with the subject of love and the subject. The variable and unaccountable changes. marriage. The variable and unaccountable changes and chances connected with the subtle passion no doubt fostered these, and people drew conclusions from the most improbable sources. The methods by from the most improvate source. The meaning of which people even yet endeavour to foretell a future husband or wife—happiness or misery—are innumerable. These customs vary in different localities, and are often restricted to certain days; such as the eve of

St. Ages or Hallows'en, the last night of October.

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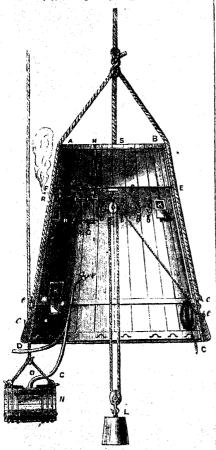
Drving Right, divined (Lat. divinus), in Pol., a term applicated to denote the scarce of kingly power, and formerly used as an argument to maintain the

claim of monarchs to absolute and unqualified obedi since from their subjects. The monarch was held to be the direct representative of Daily, to whom alone he was responsible for his actions. This subject gave rise to much controversy in England during the strug-gle between the Royalets and the Parliament, the former of whom stood up for the divine right. Some traced this divine right to the primitive patriarchs away, which was the true Scriptural idea; others to some supposed social contract, in which men gave up their natural rights in exchange for protection. The present king of Prussia, at his coronation recently excited some surprise by asserting the doctrine of the divine right of kings. divine right of kings

DIVINE SERVICE, in Law, is applied to an obsolete mode of tenure, in which the tenants were obliged to perform some special divine service; as to sing st many masses, distribute a certain sum in sims, &c.

many masses, distribute a certain sum in sums, acc.
Diving-Iblut, d'ving (Sax. dyfon, to dive), a vessel,
generally made of cast iron, by means of which persons
can descend to a great depth under water, with slight
inconvenience. It was probably invented about the
16th century. In the time of Aristotle, divers used a
kind of kettle; but the manner in which it was used in
the depth of the control of the contr not clearly described. In 1538, a diving-bell was used by two Greeks at Toledo, in Spain. In shape this vessel appears to have been very like that of the modern diving bell. The experimentalists let them-selves down under water, with a burning light inside the hell, and rose up again without being wet, and with the light still burning. The art was then new; for, according to John Taisnier, the experiment was witnessed by Charles V. and a multitude of spectators, in order to test its possibility. After the destruction of the Spanish armada, many of the ships were sunk of the island of Mull, on the western coast of Scotland. The Spanish prisoners had declared that these vesse's coutsined great riches; and this report excited much contained great riches; and this report exerted macina avarice, and tempted speculators to endeavour to gain the lost treasure. In one of these attempts, made in 1665, a rough kind of diving-bell was used, but not successfully. In 1687, a person named Phipps, under the patronage of the duke of Albemarle, formed a district formed a few patronages. the patronage of the duke of Alcelharic, formed a project for searching and unloading a Spanish vessel sunk on the coast of Hispaniola. He descended by means of a diving-bell, and returned to England with £200,000, which he had gathered from the wrsck. Dr. Halley's bell was the first really practical and useful diving-bell. It was made of wood coasted with lead, and contained about 60 cubic feet of air. It was made in the form of a truncated cone, three feet in diameter at the top and five feet in diameter at the base. In the top a clear glass was inserted, to let in the light. For the purpose of introducing fresh sir, two barrels lined with lead were sunk alongside the bell. They were provided with hose and taps commu-nicating with the interior of the bell. The pressure of the water forced the air, when required, into the vessel, and the impure air was allowed to escape through a valve in the top. In 1721 Dr. Halley's diving-bell was improved by an additional apparatus designed by himself, and by means of which the diver was able to leave the bell at some distance, and remain a considerable time in the sea. The man was supplied with air by means of a large metal helmet with glass symboles. It was supplied with air from the bell by means of facible tubes. Several ingenious improvements have been made upon Halley's diving-bell at various times, the most important of which means of peen made upon Halley's diving-bell at various times, the most important of which, perhaps, are those of Smeaton, who first applied the bell to operations of engineering. To Smeaton also belongs the invention of the modern cast-iron diving-bell. The first bell of this sort was used in the formation of Ramagnte harbour, in 1788; it weighed 50 cwt. The men inside the bell being powerless as to its motions, are obliged to communicate by means of signals with those above. On account of the facility with which water transmits On account of the facility with which water transmits aboud, a stroke on the side of the bell can be easily heard by those on the surface. Taking advantage of this circumstance, it is generally arranged that one stroke means "more act," or "pump strong;" two strokes, "stand fast;" three, "hoist;" four, "lower; "five, "more south;" six, "north;" seren, "front;" eight, "back;" nine, "lower down the bucket;" ten, the length leaded for health of the length le On account of the facility with which water fransmits "hoist up the bucket loaded, &c. At Plates XLII

and XLIII., as well as in the accompanying engravings, we give various forms of diving apparatus, from that invented by Dr. Halley to the latest and most approved invented by Dr. Halley to the latest and most approved forms, wiz, the invention of Mr. Heinke, and another called "the Nantilum." Fig. 1 Plate XLII., shows a sectional view of Dr. Halley's diving-bell, one of the air-barrels, and the appearing for enabling the diver to leave the bell. This diving-bell was of wood cased with lead, three feet wide at top, five feet at bottom, and eight feet high. In the top was fixed a meniscus quass (D) to let in light from above; there was a tap at B to let out the hot air; L M was a circular seat for the diver to sit down upon. The supply of sir to this hell when under water was provided from a couple this bell when under water was provided from a couple of barrels (C), holding thirty-six gallons each. These



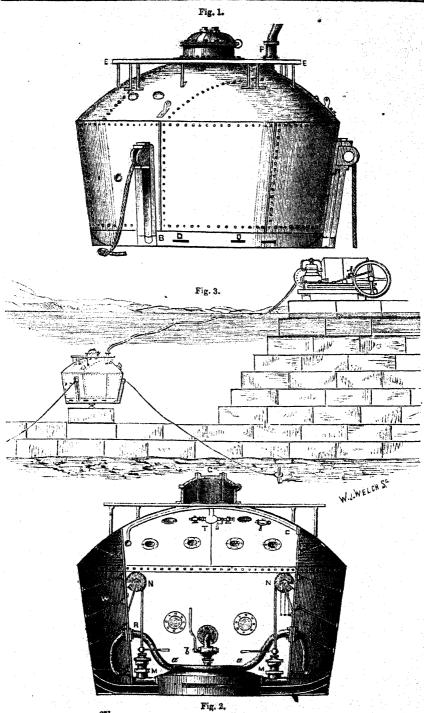
SPALDING'S DIVING-BELL.

air-barrels were provided with tackle to cause them to rise and fall alternately. In the accompanying fig. is exhibited a sectional view of Spalding's divinging is exhibited a sectional view of Spalding's diving-bell. A B C D is a section of this bell; c, c are iron hooks, by means of which it is suspended by ropes (Q, B, E, c, and Q, A, F, E, c) joining at Q; c, c are iron hooks, to which are appended leaden weights for the purpose of keeping the mouth of the bell always parallel to the sufface of the water. By these weights alone, however, the bell would not sink; another is therefore added, represented at L, which can by essaed and lowered at heleasure by means of

sides of the ball. As the bell descends, this h sides of the bell. As one bell ascentifi, and season-weight hange down a considerable way below the mouth of the bell. In case the edge of the bell is caught by any obstacle, the balance-weight is imme-diately lowered down, so that it may rest upon the bottom; by this means the bell is lightened, so that bottom: by this means the bell is lightened, so that all danger from oversetting is removed. By an ingenious contrivance it was possible to raise this bell, with all the weights appended, to the surface, or to stop at any particular depth; and thus they would still be safe even if the rope designed for raising the bell were broken. For this purpose the bell was divided into two compartments, each of which was made as tight as possible. Just above the second bottom (E, F) are small slits in the sides of the bell, through which the water, entering as the bell descends, displaces the air originally contained in the compartment, which goes out at the orilles H. When this is done, the divers turn a handle which stops the cock, so that if any more air enters the compartment A E FB, it could no longer be discharged through the orilles H as before. When this compartment is full of water, the bell sinks; but when a considerable oridee H as before. When this compartment is full of water, the bell sinks; but when a considerable quantity of air is admitted, it rises. If, therefore, the divers desire to rise, they turn the small cook I, by which a communication is opened between the upper which a communication is opened, between the upper and lower compartments of the machine; the conse-quence of this is that a quantity of air immediately enters the upper compartment, forces out a quantity of water contained in it, and thus renders the bell lighter by the whole weight of the water which is thus displaced. N represents an air-cask with its tackle, and C I' the flexible pipe through which the sir is admitted to the bell. It is a small cock by which the mitted to the bell. It is a small cock by which the hot air is discharged as often as it becomes trouble-some. One of the most ingenious of the many machines devised to answer the same purpose as the diving-bell was that invented by Mr. Rowe. At Ig. 2, Plate X Li I., is given a view of this machine. It was a trunk or hollow vessel of copper or brass, of sufficient strength to resist the pressure of deep waters. It was designed to contain the body of a man, supposed to enter therein feet foremost, at A A, bent at the bearing of his knees at B. At A, a, and on the other side, were holes for his arms to pass through, and a glass to see through at b; d represents a sleeve made of soft leather, and featened to the body of the machine at a; A A represents a cover to fit the head of the machine, fastened down with screws, so as to prevent leakage in any depth of water; D represents a plate of lead to act as a weight to sink the machine, as well as to form a balance thereto; g is the rope by which the apparatus is let down and hauled up from the bottom; h is called the life-line, with a knot at t, so that the handle at f may always remain at a due distance for the diver to take hold of, in order to signal those above. At E and F are two brass screws, the caps of which are onened as soon as the diver rises and a glass to see through at a; d represents a sleeve the caps of which are opened as soon as the diver rises the caps of which are opened as soon as the diver rises to the water's surface, to supply him with freah air; H H is a rope, to which the diver fastens anything to be brought up. Klingert's diving-machine is shown fully equipped according to this method. It was constructed of strong tin plate in the form of a cylinder, and was placed over the head and body of the diver, leaving the legs and arms free. Fig. 4, Plate XLII., exhibits a sentional drawing of Triewald's diving-bell, which machine (A B) since with leaden which the CDD. which machine (AB) sinks with leaden weights (DD), suspended from the bottom of it. It was made of copper throughout the inside; three strong convex lenses, only two of which (G, G) are seen, defended by copper lids (H, H), illuminated this machine. The iron plate E served the diver to stand upon when at work. This is suspended by chains (F, F) at such a distance from the bottom of the bell, that when the diver stood upright, his head was just above the water in the bell, where he had the advantage of air fitter. ropes (Q, B, E, c, and Q, A, F, B, c) joining at  $Q_1$  for respiration than when he was higher up in the hell; c, c are iron hooks, to which are appended leaden when the purpose of keeping the mouth of the wights for the purpose of keeping the mouth of the always parallel to the sufface of the water. By these weights alone, however, the bell would not sink. This was affected by means of a partial copper table (b c). A most efficient and safe apparatus to can be raised and lowered at pleasure by means of a submarine operations to be conducted has been rope passing over a pulley (a), and fastened to the

has spent many years in conducting works under water. His invention consists of a diving-helmet, which is attached to a waterproof dress. A most useful adjunct is the submarine lamp, to be carried in the hand of the diver, which is also the invention of Mr. Heinke. With respect to the helmet,—upon the breastplate and in front of the diver is placed a safety breastplate and in front of the diver is placed a safety-valve, so as to be easy of sceess to the man, who can at any moment close it wholly or partially; by which means the egrees of the air fed from above can be regulated. If the diver closes this valve completely, his waterproof dress is at once inflated, and his buoyancy becomes so greet, that without an effort he rises to the surface like a cork, in a much more expeditious manner than he could climb up by the ladder, or even be drawn up by those stationed above: should any injury happen to his dress or the glass eyepiaces of his helmet be broken, the opening thus formed can be instantaneously turned into an egress-hole, and the air be driven out by this into an egress-hole, and the air be driven out by this exit, to the total exclusion of the water. This appaexit, to the total excussion of the water. This apparatus was exclusively used in the submarine works in the Westminster Bridge, when an instance of the value of the invention was given. It happened that one of the divers struck one of his glasses against a spike, and had be not closed the valve, the water would introduce that contracted and doubtless the diverse would instantly have entered, and doubtless the diver would have been drowned; but as it was, he turned the valve, instantly have antered, and doubliess the diver would have been drowned; but as it was, he turned the valve, and experienced no inconvenience: his clothes were not even wetted by the accident. At Plate XLIII., figs. 1, 2, 3, we give engravings showing a section and elevation of one of Heinke's belinets, as also a sectional view of the valve. A writer in the Mechanic's Magazine thus describes them:—"Fig. 1 shows a front elevation of the helmet itself. It will be seen from this that the openings are also provided (as an extra safety-guard) with segmental plates, so that by turning either disc round by means of the buttons which project from the circumference, the openings can be closed instantaneously. The regulating or safety valve is seen in front of the helmet, just below the joint indicated by the letter A, which joint enables the whole top of the helmet to be taken off at pleasure. Fig. 2 shows a section through the head-piece, exhibiting the pipe at the back through which the sir is fed down the valve for safety, in the event of the bursting of a feed-pipe. From the orifice will be seen the tubes extending over From the orifice will be seen the tubes extending over the upper internal surface of the helmet, for leading the stream of air over the glasses; and again below, and marked by the letter B, will be seen the safety-valve before mentioned, which can be opened or shut at pleasure by the diver. This valve is shown in section on a larger scale in fig. 3. It will there be seen that an ordinary valve, which is held in place upon its seat by means of a spiral spring, is covered with a cup perforated in the top so as to allow of the escape of such air as passes; but so fitted as to turn upon the outside of the valve-box or seat at pleasure. This is provided with a long slotted hole, which runs some distance around its circumference, and the lower part of the valve-seat or box is provided with a similar slot. From this description it will be apparent that the cup can be turned so as either to let the two holes be in one, and thus open to allow of the escape of the air, or the upper internal surface of the helmet, for leading From this description it will be apparent that the cup can be turned so as either to let the two holes be in one, and thus open to allow of the escape of the air, or be closed, should it be desired. By this simple contrivance the diver can regulate the egress of the air, and so the extent of the supply, to the greatest nicety. We must now pass on to the latest of Mr. Heinke's improvements,—his lamp. Figs. 4 and 5 show a side elevation and longitudinal section of this show as delevation and longitudina

this means the bottom surface of the sea can be examined without removing the lamp from its upright position. The lamp is also provided with two eide lenses I, I; or three can be used if required. The upper cup is fitted with an internal cone, which is connected with a pipe leading to the surface of the water for the escape of the products of combustion. This lamp gives a brilliant light, and the air supplied, percolating through the lower ring, enables it to burn steadily, a matter of considerable importance." By means of this valuable invention a diver may conduct his operations at the bottom of the sea in comparative his operations at the bottom of the sea in comparative safety. The new form of diving bell, which has re-ceived the name of "the Nautilus," has been success-fully used in the construction of the Victoria docks and in some works on the Seine. The Nautilus machine is entirely independent of suspension; its move-ments are entirely dependent on the will of those within it, and without reference to those who may be stationed without. A reference to fig. 1 will show that the form of the Nautilus is a perfectly enclosed one; hence, its displacement of water being greater than its own weight, it must float to the surface. The entrance to the machine is through a man-hole at the top. The interior is divided into chambers, which are connected at or near the bottom of a pipe  $(a \ a, \text{fig. 2})$ , which opens by a tap (b) outwards to the external surrounding water. An opening in the bottom of the machine, of variable dimensions, is closed by a door or doors susceptible of being opened or closed at pleasure. The chambers (W, W, fig. 2) are likewise connected at top by a smaller pipe (c c), which opening is affixed a flexible pipe with smaller of the machine, and to which opening is affixed a flexible pipe with coils of wire spirally enclosed. This pipe (T) has also branches communicating with the larger or working chamber. The Nautilus is supplied with air through chamber. The Nauthlus is supplied with air through the flexible pips a, fig. 2, by means of the arrangement depicted in the engraving, fig. 3. A powerful sir-condensing pump furnishes a receiver in connection with the flexible pipe a. The modus operandi studescribed in the last edition of Ure's Dict. of Arts, Mamfactures, and Mines:—"The operator with his assistants enters the machine through the top, which is then closed. To descend, the watercock (b) is opened, and the external water floweints the obsumbers W. W. at the same time a cock on a vine opening W, W; at the same time a cock on a pipe opening from the chambers outward, is opened, in order that, from the chambers outward, is opened, in order that, the air escaping, an uninterrupted flow of water may take place into the chambers. The weight of water entering the chambers causes a destruction of the buoyancy of the machine, and the Nautilius gradually sinks. As soon as it is fairly under water, in order that the descent may be quiet and without shock, the watercock b is closed. The receiver at the surface being previously charged by the air-pump to a density somewhat greater than that of the water at the depth proposed to attain, one of the branch-cocks on the pipe c c, connecting the chambers at top, is opened, and the air rushes into the working-chamber, gradually condensing, until a density equal to the density of the water without is attained; this is indicated by proper air and water gauges. These gauges marking equal points, showing the equilibrium of forces with-out and within, the cover to the bottom (z) is removed



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## Divining-Rod

DIVINING-Rop, div-i'-king (Lat. divine, I divine), a hazel twig cut in the form of a y, by the aid of which certain persons, called dowsers, pretend to be able to discover water or mineral veins. The rod is held in a peculiar manner, and the dowser walks backward and forwards over the ground to be tried. As soon as he crosses or appreaches a metallic vein or aqueous spring, the twig turns towards it with a slow rotatory motion. The superstition has not yet died out, and dowsers are common in Devon and Cornwall. DIVINITY. (See TEMPLOGY.)

DIVINITY. (See THROLGGY.)
DIVINITY. (See THROLGGY.)
DIVINITY, divise-s-bit-e-fe, the property possessed by all bodies of being acparable into parts. The question as to whether matter is or is not infinitely divisible, was formerly much agitated among philosophers. According to the nature of the atomic theory, the question is not of importance to science; but, from investigation made, there seems to be no limit to the divisibility of the most solid bodies. The diffusion of colours through the atmosphere shows the minute division of material particles; and the tinging of large quantities of fluid with minute portions of colouring matter is an instance of the same. In the gilding of buttons, five grains of gold, which is applied as an amalgam with mercury, are allowed to each gross. In this way a coating is left which must amount to the urine of 13,000 feet, covered throughout its entire length with gold. In the theory of numbers, the term divisibility indicates the capability of any number being divided by another without remainder.

DIVISION, div-iz'-zhun (Lat. dividere, to divide).—In Mil., an army which is under a general officer, known as the commander-in-chief, is always divided into two or more divisions, each under the command of a general officer. Each division is again subdivided into brigades, and each brigade is composed of about four regiments or battalions. A division consists of all arms of the service,—cavalry, infantry, and artillery.
DIVISION, in Practical Mus., implies a course of notes running into each other in such a manner as to form one connected been of sounds. in Yocal Mus.

DIVISION, in Practical Mus., implies a course of notes running into each other in such a manner as to form one connected chain of sounds; in Vocal Mus. it is applied to a single syllable. The singing or playing a passage of this kind is called running a division. With theoretical musicians it signifies the divisions of

the intervals of the octave.

Division, one of the principal rules of arithmetic. By this operation can be determined how often one quantity is contained in another. There are three numbers employed in division: the first is called the divisor, the second the dividend, and the third the quotient. The dividend is the number to be divided; and the quotient. The dividend is the number to be divided; and the quotient, the result. Both divisor and quotient are factors of the dividend. Division may, therefore, be defined as the operation of finding the second factor of a given quantily when the first is given. It is divided into two classes,—arithmetical division and algebraical division. In arithmetical division, when the numbers are expressed in the scale of tens, the following is the mode of working:—On the left-hand side of the dividend, is written the divisor, separating them by a line. Beginning with the highest order of units of the dividend, the lower orders are passed over until the fewest number of figures is found that will contain the divisor; it is next determined how many times the divisor is contained in these figures, and the number is written on the other side of the dividend, beginning from the left, for the first figure of the quotient. The divisor is contained in these figures of the dividend used, and subtracted from them, and the next figure of the dividend is brought down to the remainder. The operation is contained that if all the figures of the dividend are used; the final result is the quotient. The operation is contained in the result forms the second figure of the quotient. The operation is contained in the result forms the second figure of the quotient. The operation is contained in the result forms the second figure of the quotient. The operation is contained in the result forms the second figure of the quotient. The operation is contained in the result forms the second figure of the quotient. The operation is contained in the result forms the second figure of the quotient. The operation

### Division

first reduced to simple fractions, if one or both are mixed fractions; the terms of the divisor are then inverted, and the dividend multiplied by the resulting fraction. The product is the fractional quotient, which is reduced to its lowest terms, or sometimes to a whole number, by the rules for the transformation of fractions. As an example:—Divide

 $5_2^*$  by  $2_1^*$ ;  $5_2^* = 1^*$  and  $2_1^* = 1^*$ ; hence the quotient is equal to

 $\frac{43 \times 7}{8 \times 15} = \frac{901}{120}$ 

which cannot be reduced to lower terms. In the division of decimal fractions, the dividend and divisor are written down as whole numbers, as many 0's being added to the dividend as may be necessary. The diviadded to the dividend as may be necessary. sion is performed as in whole numbers, continuing the process to any desired extent, or till a remainder is found equal to 0. A number of decimal places, equal to the number of decimal places in which the dividend arounds the dividend to exceeds the divisor, is then marked off the right hand of the quotient. If there are not enough in the of the quotient. quotient, 0's are prefixed till the requisite number is obtained: the result is the quotient. When the numbers are expressed in any of the varying commercial scales, as pounds, shillings, and pence, two cases may arise; first, when the dividend is expressed in the varying scale, and the divisor in the scale of tens; and second when the dividend and divisor are expressed in varying scales. When the divisor is expressed in the scale of tens, the quotient is in the same scale as the dividend. The following is the rule adopted — Divide the number of units of the highest order in the dividend by the divisor; the quotient will be the number of units of the same order in the quotient sought, Multiply the remainder by the number of units of the next lower order which make one of this order, and to the product add the number of units of the next lower the product add the number of thinks of the next lower order in the given number; divide this sum by the divisor, and the quotient will be the number of units of this orderin the quotient sought. This operation is continued till the lowest order of the scale is reached, and the result is the quotient sought. Thus, let it be required to divide £25. Ss.6d. by 3, the operation is as follows :-

The operation may, however, be much simplified in practice. When both dividend and divisor are expressed in varying scales, it is necessary that both should be reduced to the same unit, and the quotient is consequently expressed in the scale of tens. As an instance, divide £25. 10a. 9d. by 18s. 11d. If both are reduced to pence, they stand £25. 10a. 9d. = 6,120d.; and 18s. 11d. = 227d.; whence,

$$\frac{6129}{227}$$
 = 27, the quotient required.

number of times the divisor is contained in the result forms the second figure of the quotient. The operation is continued till all the figures of the dividend. The operation is continued till all the figures of the dividend are seed; the final result is the quotient sought. If the final remainder is 0, the division is said to be exact, or the dividend contains the divisor an exact number of the dividend and dividend division is also performed in varying scales, either in terms, ordinary fractional units, or in the varying scales of commerce. If the numbers to the divisor. The result is the quotient sought. If the signs of the divisor are alike, the sign be divided are fractions, dividend and divisor are conditions. In vulgar fractions, dividend and divisor are conditions of algebraical division includes

### Division

Divisor

the division of a polynomial by a monomial. In this case each term of the polynomial is divided separately by the divisor. The algebraic sum of the separate results is the quotient. The third division is the division of polynomials. Both dividend and divisor are arranged with reference to the same leading letter. The first term on the left of the dividend is then divided by the first term on the left of the divisor, and the quotient forms the first term of the quotient. The divisor is then multiplied by the term of the quotient found, and the product subtracted from the dividend for the first remainder. The first remainder is then divided by the first term of the divisor for the second term of the quotient. The divisor is multiplied by this term of the quotient, and the product subtracted from the first remainder to make the second remainder. The operaremainder to make the second remainder. The opera-tion is continued till a remainder is found whose first term is not exactly divisible by the first term of the divisor. The operation of the division of polynomials may sometimes be shortened by various methods. Among these may be mentioned synthetic division, which is applicable when the dividend and divisor are homogeneous, and contain only two letters. In the division of radicals, the process depends upon reducing the radicals to equivalent ones of the same degree. A number may also be divided by another by subtracting the logarithm of the divisor from the logarithm of the dividend: the number corresponding to the remainder in the logarithmic table is the quotient required.

Division, in Log., is the separating a thing into several parts or ideas. Logicians distinguish three kinds of division:—1. When the genus or kind is divided by its species or differences; 2. when a thing is divided into several classes by opposite accidents; and 3. when the accidents themselves are divided according to the subjects in which they inhere. The laws of division are,—1. That it be full and adequate,—that is, that the members of it entirely exhaust the whole thing divided; 2. that the members of the division be opposite; 3. that one member of the division be not contained in the other, so that the other may be affirmed of it; 4. the division should not be into too many or too general parts; and 5. the members, unless the subject require it, should not be too

unequal.

DIVISION OF LABOUR, in Pol. Ec., is applied to that necessary division of occupations which is a consequence of man's living in society. In that rude state of society m which there is no division of labour, every man endeavours to supply by his own industry his wants as they occur. "When he is hungry, he goes to the forest to hunt; when his coat is worn out, he clothes himself with the skin of the first large animal he kills; and when his hut begins to go to ruin, he repairs it as well as he can with the trees and the turf that are nearest to it." But as men came to live in society, they found But as men came to live in society, they found that one person could produce more by confining his attention to only a few objects than by carrying on a great many. Their wants, too, gradually increased; and as the means of supplying these could only be obtained through labour, they were naturally led to seek the greatest amount of production from the least seek the greatest amount of production from the least expenditure of labour. Hence the principle of division of labour is the very foundation of any social system, and must have existed from very early times; but it remained for political economy to discover its nature, uses, and results. Adam Smith was the first to point out definitely the great importance of this principle. "The greatest improvement," he says, "in the productive powers of labour, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed or applied, seem to have been the effects of skill, dexterity, and judgment with which it is anywhere directed or applied, seem to have been the effects of the division of labour." He instances the trade of a pin-maker, in which, he says, "one man draws out the wire, another straights it, a third cuts it, a forth points it, a fifth grinds it at the top for receiving the head. To make the head requires two or three distinct operations; to put it on is a peculiar business; to whiten the pins is another; it is even a trade by itself to put them into the paper; and the important business of making a pin is in this manner divided into about eighteen distinct operations." In a small mannfactory, he says, whore only ten persons were engaged. factory, he says, whore only ten persons were engaged, they could make upwards of \$6,000 pins a day, or \$,800 each. Such has been the progress of improve-

ment since his day, that each person can now produce more than double that number. The great increase of the quantity of work produced in consequence of the division of labour is owing, he says, "to three different circumstances: first, to the increase of dexterity in every particular workman; secondly to the saving of the time which is commonly lost in passing from one species of work to another; and lastly, to the invention of a great number of machines, which facilitate and abridge labour, and enable one man to do the work of of a great number of machines, which facilitate and abridge labour, and enable one man to do the work of many." As it is the power of exchanging that leads to the division of labour, so the amount of labour, and consequently the extent of division, must always be limited by the extent of the market. If there were no means of exchanging, men would be obliged to provide everything that they require for themselves. Hence it is, that in populous cities trades are subdivided to a nuch greater extent then in villages or country parts. much greater extent than in villages or country parts; and hence, too, the advantages to be derived from the division of labour can only be reaped in their full extent where there is a great power of exchanging or an extensive market. Another important consequence of the division of labour, and one which Adam Smith, though he has alluded to it, has not prominently stated, is the power possessed by every country of availing itself to a certain extent of its natural or acquired advantages, which is called the territorial division of labour. Nature seems to have intended to unite, by mutual dependence, all the countries of the world into mutual dependence, all the countries of the world into one commercial family. For this purpose, different districts or countries have different products and capacities; so that some are more particularly adapted for carrying on some branches of labour, and others for others; and the full advantages of which can only be reaped by free intercourse between the different nations. The commerce of one country with another The commerce of one country with another nations. is merely an extension of that division of labour by which so many benefits are conferred on the human race. By means of nutual intercourse, mankind are enabled to distribute their labour as best fits the genius of each particular country and people; and the indus-try of the whole is thus rendered incomparably more productive. There is unother feature of this question which it is necessary to glauce at, and that is, the effect of this minute subdivision of labour upon the workmen themselves. Some hold that it reduces men to the character of mere organized machines, and affords them no scope for mental development. This, however, we do not believe to be the case. Man's mental condition is principally dependent upon the circumstances by which he is surrounded and the persons with whom he associates. Rarely does his occupation, especially if it be of a manual kind, exert great influence upon it. In rural districts, where employ-ments are less divided than in large cities, we do not find that the people in the former case display more intelligence than the latter, but the reverse; the frequent intercourse among their fellows, and the great variety of objects that are constantly exciting the attention of the city man, giving him a greatly superior mental training to the other. But we believe a division of labour to be good for man, because it is inseparably connected with civilization; for, if the one is beneficial, so of necessity must be the other.

DIVISION OF TIME.—The length of sounds in Mus. is regulated by dividing the time occupied in the performance of any given melody or harmony into regular formance of any given melody or harmony into regular portions called measures. In order to illustrate this more clearly, we will take a straight line and divide it into equal portions,—the straight line to represent the time of the melody, and each division to constitute a measure or bar. The time must be kept equal by motions of the hand or foot. Presuming the true time of a crotebet to be known, we will suppose the bar to be subdivided into four crotehets (as in common time), when the half of the measure will of course be two crotehets; therefore the hand or foot being raised, we crotchets; therefore, the hand or foot being raised, we put it down for the first note, raise it with the third, and lower it again to commence the next bar. Time is to music what rhythm is to poetry, and cannot be too widdle observed.

to music was rayellar and rigidly observed.
Divison, dic-1-zor, one of the factors of the dividend,—the factor by which the dividend is divided.
Divisors of a number are those numbers by which it is exactly divisible. Thus, 1, 2, 3, 4, 6, and 12 are

### Divi-divi

divisors of 12, because 12 hay be divided by each of them without a remainder.

them without a remainder.

Divi-divi. (See Clearings.)

Divonce, di-core (Lat. dicordium, from diverto, I turn away or separate), denotes a separation by law of husband and wife; and is either a divorce a vinesto matriagen; (from the bond of marriage), or a messe of there (from bed and beard), the marriage in the former case being dissolved, but not so in the latter, the par case being dissolved, but not so in the latter, the par-ties being only debarred from living together. Accord-ing to the law of Moses, "when a man hath taken a wife and married her, and it come to pass that she find no favour in his eyes because he hath found some un-cleanness in her; then let him write her a bill of divorce-ment, and give it in her hand, and send her out of his house."—(Dieut, xxiv. 1.) After ninety days the wife might marry again; but after she had contracted a second marriage, though she should be again divorced. second marriage, though she should be again divorced second marrage, mought not take her again to be his wife. The like lax notions on the subject of marriage appear to have prevailed generally in the East at that early period; and even at the present day, as among the Arabs, a lustband can divorce his wife on the slightest occasion; Burckhardt mentioning that he had seen Arabs, not more than forty-five years of age, who were known to have had more than fifty wives. The Mahommount to nave not more than may nives. The Manon-medan law allows of a separation by mutual consent, giving the wife the right of retaining her marriage por-tion unless she agrees to relinquish a part of it as the price of the separation. They are permitted to sepa-rate and reunite twice; but, after the third divorce, he cannot again receive her until she has been married and directed by another. Among the Histograph and divorced by another. Among the Hindoos and Chinese, the notions are still more lax on this subject, and a husband may divorce his wife upon the slightest grounds, or even without assigning any reason. Among the causes that are considered to justify separation are loquaciousness or quarrelsomeness on the part of the wife. The laws of the several Grecian states regarding divorce differed greatly from each other: in some it was permitted on slight grounds; in others the laws were stringent regarding it. At Athens divorce was permitted on slight causes, but not without giving a bill containing the reasons for it, to be approved, if objected to, by the chief archon. At Sparts, divorces seem to have been very rare. By the early laws of Rome, the husband was not allowed to divorce his wife without just cause; as for adultery, drunkennness, counterfeiting his keys, or poisoning his children. Other causes were afterwards added, and at length divorces took place on very frivolous pretexts, and the women enjoyed the same liberty as the men. Hence Augustus introduced a law enacting additional ceremonies in obtaining a divorce, and requiring the presence of seven witnesses, before whom the marriage contract should be torn. By the Theodosian code, among the causes for which a busband could divorce his wife, were, adultery; the being a witch or a murderess; commit-ting sacrilege; violating sepulchres, or buying or sell-ing one free-born to slavery; favouring thieves and robbers; frequenting sights or theatres, or feeding with strangers against the wishes of her husband; the being privy with those that plot against the state, or dealing falsely or offering blows. If the wife could prove the husband guilty of any of these crimes, she prove one nususand gainty of any of these extines, and also was at liberty to leave him; but could not marry again until after the expiry of one year, whereas the lusband might marry again immediately. Voluntary divorces were abolished by one of the novels of Jastinian, but were afterwards revived by another smoot under the emperor Justin, and the practice; and may also order him to pay the costs amounted to have continued in the Eastern empire down to the 9th or 10th century, when it was flually sundaid by the influence of Christianity. The Scripture doctrine on this subject is enunciated by our flavour, when he says, "Have ye notreed that he who less the provision for the maintenance them at the beginning made them make and female; and said, for this cause shall a man leave father and mother, and shall cleave to his wife, and they twain shall be one flesh." "What, therefore, God hath joined togother, let not man put assuder." "Moses, because of the hardness of your hearts, suffered you to put away your wives; but from the beginning it was not so; and I say usto you, Whosever shall put away his wife exceptit He for fornication, and lso was at liberty to leave him; but could not marry

## Divorce

shall marry another, committeth adultery; and whose marrieth her who is put away doth commit adultery."
—(Matt. xiz. 4—9.) Our Saviour's declaration naturally
became the foundation of the law of divorce in all Christian countries; and after marriage was raised to the dignity of a sacrament by Pope Innocent III., in 1215, the ecclesiastical courts claimed the sole jurisdiction over it. The papel canon law regarded the bond of marriage as indissoluble, but allowed a divorce a measa et thore for five causes; viz., adultery, impotency, cruelty, infidelity, and ingressus religionis. The Church, however, assumed to itself a power to grant dispensations for absolute divorces. The principle of the canon law, not admitting of an absolute dissolution of the marriage contract for any cause whatever, governed the ecclesi-satical law of this country. A divorce was only a judicial separation a mensa et there, not sllowing either of the parties to marry again during the lifetime of the other. An individual, however, if able to incur the expense, might, after a sentence of divorce a mensa et thore, pronounced by the ecclesiastical court, by obtaining an act of parliament, procure a suspension of the law, and, by legislative interference, obtain a directivity of his marries. dissolution of his marriage. There were certain causes, however, which were regarded as nullifying marriage and justifying a divorce a vinculo matrimonii; as, vious marriage still subsisting, or affinity within the prescribed degree,—the sentence in such a case being declaratory only that the marriage was originally null and void. The law of England granted judicial separation only on the grounds of adultery or cruelty; and the effect of it was to place the woman in the same position as a femme sole, enabling her to hold and deal with property free from the control of her husband; and in the case of the man, relieving him from all obligation to support his wife. By act 20 & 21 Vict. c. 85, an entire change was effected in the law of divorce in England. and a court instituted with exclusive jurisdiction in matters matrimonial, and with authority, in certain cases, to decree the dissolution of a marriage. The entire jurisdiction, therefore, previously exercised by the ecclesiastical courts in matters of divorce, was transferred to this court under the name of the Court for Divorce and Matrimonial Causes (see next article); and sentence of judicial separation (having the same effect as a divorce a mensa of thoro) may be obtained effect as a divorce a mense of thorough may be obtained, either by the husband or wife on the ground of adultery, or cruelty, or desertion without cause for two years and upwards. This court has also the power of dissolving a marriage on a petition preserved by the husband, setting forth that his wife bad been guilty of adultery, or on a petition by a wife on the ground that her hus-band had been guilty of incestuous adultery, or of adultery with cruelty, or adultery with desertion for two years or upwards. It is the duty of the court not to satisfy itself as to the facts alleged, but also whether or not the petitioner has been in any manner accessory to or conniving at the adultery, or has con-doned the same; and shall also inquire into any counter charge which may be made against the petitioner. any of these cases, or if there is reason to believe that the petition is presented or prosecuted in colinsion with either of the respondents, then the court shall dismiss the said petition. The court may also, if it sees fit, order the bushand to secure to the wife such gross or order the husband to secure to the wite such gross or annual sum of money for any term not exceeding her own life, as it may deem reasonable in the circum-stances. It can also allow damages, if asked for, against the adulterer, and may siso order him to pay the costs of the proceedings. It has also the power to declare in what manner such damages are to be paid or ap-plied, and to direct that the whole, or any part thereof, shall be settled for the benefit of the children, if any,

the children of the marriage, or either of them. Either party may appeal from a decision of the judge ordinary to the full court, and either party dissatisfied with the to the full court, and either party dissatisfied with the decision of the full court on any petition for the dissolution of a marriage may, within three months after the pronouncing thereof, appeal therefrom to the House of Lords, it then sitting, or within fourteen days after its next meeting. Every decree for a divorce is thus a decree nist, and not absolute till after the expiration of not less than three months, within which time it shall be lawful for any person to show cause why such decree should not be made final. After the decree has become final, it shall be lawful for the respective parties thereto overthe again as if the prior marriage had been disto marry again, as if the prior marriage had been dis-solved by death; but it is provided that "no clergyman in holy orders of the united church of England and Ireland shall be compelled to solemnize the marriage of any person whose former marriage may have been dis-solved on the ground of his or her adultary, or shall be liable to any suit, pounlty, or censure, for solemnizing, or refusing to solemnize, the marriage of any such per-The law of Scotland on this subject differs materially from that of England. According to the former, if the husband should either abandon his family, or turn his wife out of doors, or by barbarous treatment endanger her life, or render her condition quite uncomfortable, the judge will, on proper proof, authorize a separation a mensa et thoro, and award a separate alimony to her, suitable to her husband's fortune, to take place from the time of the separation, and to continue till there shall be either a reconciliation between the parties or a sentence of divorce. Actions of dithe parties or a sentence of divorce. Actions of di-vorce were formerly brought before the Supreme Commissary court of Edinburgh; but by act of parliament in 1830, they were removed to the jurisdiction of the court of Session; and questions of fact connected with such cases may, at the discretion of the court, be tried by jury. The grounds of divorce are two: adultery, and wilful desertion, the latter of which must have continued for four years. The pursuer must also swear that the action is not carried on by collusion. The offcuding parties cannot intermarry. The effect of a decree of divorce is, that the offending party forfeits all benefit which might accrue to him or her from the marriage. In France, before the revolution of 1782, marriage was, in accordance with the principles of the canon law, held to be indissoluble; but after that event very lax notions prevailed on this subject, and divorces were permitted on very slight grounds. The Code Napoléon greatly restricted this liberty, but allowed a divorce to either party on the ground of adultery, outrageous ill-usage, and some other causes. In Holland, divorce a vinculo matrimonii is obtainable on the ground of adultery or desertion. In the different states of America the laws are by no means uniform on states of America the isws are by no means uniform on this subject. In several of them no divorce is granted but by special act of the legislature; but generally, divorce a vincula may be granted by courts of justice for adultery. In most of the states, in addition to adultery, intolerable ill-usage or wiful desertion (in some for seven, in others for three years), will form grounds for a divorce a ninculo matrimonii.

DIVORCE AND MATRIMONIAL COURT is a court instituted by act 20 & 21 Vict. c. 85, for trying matrimonial causes, and granting decrees of divorce, which had been formerly under the jurisdiction of the ecclesissical courts. The judges of this court are, the lord charellor, the lord charellor, the lord cherjustice of the court of Queen's Bench, the lord chief justice of the court of Common Pleas, the lord chief baron of the court of Exchequer, the senior puisne judge for the time of the three lastmentioned courts, and the judge of her Majesty's court of Probate, the last of whom to be the judge ordinary. By 23 & 24 Vict. c. 144, the powers of the judge ordinary were much extended, so that he may now alone pronounce a decree of divorce, a power which was at first reposed in the whole court. DIVORCE.)

DIVORCE.)

Do, do, the name of the first note of the natural major diatonic scale. It has been long since substituted for that of ut, which was employed by Guido, the latter monosylbable being rejected as too hard and rough.

DOURTH, do-se'-ts (Gr. dokein, to seem), an heratical sect that aprung up very shortly after the foundation of the Christian religion. As their name implies, they

disbelieved in the incarnation of Christ; asserting that he acted and suffered in appearance only. It is believed by some divines that several portions of St. John's Gospel were especially directed against the doctrines held by the Docetae.

Docu, doc (Tent. docke, probably from dekken, to inclose), an inclosed space or artificial basin in the bank of a river or side of a harbour, contrived for the reception of ships. There are two kinds of docks,—wet and dry docks. A wet dock may either have gates to retain the water in it, so that ships may remain in it afloat, or be left open for the tide to flow in and out. A wet dock without gates is generally called a basin, the term is, however, sometimes applied to a wet dock the term is, however, sometimes applied to a wet dock with or without gates. A dry dock either becomes dry by the ebbing of the tide when the gates are left open, or by shutting the gates at low water and pumping out whatever water may be left at that time. Docks of this kind are employed for repairing and examining ships. Wet docks are used for the loading and unloading of vessels, and contrived generally for the purpose of keeping them always aflost. The first wet dock made for commercial purposes in this kingdom was formed in 1708, at Liverpool. At nearly all the most important ports and harbours in Britain now there are several extensive and commodious wet docks. Wet docks are usually surrounded by quay now there are several extensive and commodious wet docks. Wet docks are usually surrounded by quay or wharf walls of solid masonry or brick-work, and are entered by means of a lock, having two gates, usually in two folding leaves each: this arrangement, in many places, enables vessels to enter or go out a considerable time before or after high water. Dock gates, till late years, were opened and shut by means of chains worked by hand, either by capstans or winders; hydraulic machinery is, however, now much used. The principal docks in the world are those of London, Liverpool, and Birkenhead. In London, the Commercial dock, situated at Rotherhithe, has an area of mearly 50 acres, four-fifths of which are water: it is principally used in the corn and timber trade. The West-India docks extend across the Isle of Dogs, and consist of two portions,—the im-Isle of Dogs, and consist of two portions,—the import dock and the export dock; they are both 680 yards in length, and between 130 and 170 yards in width. The East-India docks are situated at Blackwall, below the entrance to the West-India docks; the area of extent is 30 acres, and they are divided into the loading and unloading docks. The London docks, at Wapping, were finished in 1805; they cover a space of 28 acres, and have extensive warehouses for wine and tobacco. St. Katherine's docks, situated between the London docks and the Tower, were finished in 1828; their area is 24 acres, and they are divided into two portions, capable of receiving vessels of 800 tons burportions, capable of receiving vessels of own consultations, capable of receiving vessels of own each cheer state dense only 11 acres of the space are water, the rest being taken up with large warehouses and extensive quays. The Victoria docks are situated on the Plainet own marshes, on the north side of the Thames, inmediately below the East and West India docks; they comprise a half-tide basin of 16 acres, an inner dock of 74 acres, and a portion (12 acres) of the canal intended to intersect the eastern lands of the company. Some very large warehouses are attached to these docks, used chiefly for the storing of tobacco. In the following table will be found a nearly correct statement of the number and areas of the docks in Great Britain, including those locks or entrance-basins provided with gates, at a number of the principal ports :-

and the state of the state of the state of	No.	. •	Areain Acres
London	28		
Liverpool			
Birkenhead, belonging to the Liver-			
pool corporation	4		142
Bristol	4		79
Hull, exclusive of timber-ponds	7		461
Great Grimsby	2		51
Hartlepool	1		20
West Hartlepool, inclusive of tim-			
ber-ponds	9		32
River West	2	*****	41
River Tyne	4		107
Leith	3		151
Dundee, partly unformed	4		
Aberdeen	1		85

z 2

For further information concerning the docks of Great Britain see McCalloch's "Commercial Dictionary." Docks are generally the property of large companies and as their management is costly, they require to be supported by those vessels using them; this is done by levying rates, powers being granted by the acts of parliament authorizing the construction of the various docks. Sometimes dock dues are levied on vessels in bulk according to tonnage, and sometimes according to the nature or value of the goods.—Ref. Chambers' Encyclopædia.

DOCK, the common name for some species of Rumex

(which see).

Doek, the inclosed space, usually surrounded with an iron railing or checause de friee, in which a prisoner

is placed during his trial.

DOCK WARRANTS, orders for the removal of goods stored or warehoused in the several docks. The orders are granted by the proper persons appointed at docks in favour of any one for whom the importer applies The rules laid down by the various dock companies closely resemble each other, and are very strictly attended to. Unless the rules are compiled with goods will not be delivered up. Warrants can be obtained for a whole or part of a cargo; and a warrant can also be divided into smaller warrants, and these may be assigned; a warrant may also be assigned by a holder. If a warrant is lost, a fresh warrant is not granted till the first warrant is advertised; and before it is granted the holder is obliged to enter into an agreement with the company to indemnify them in case of any future

1068. DOCKET, DOCQUET, or DOQUET, dok'-et (Welsh lociaw), is a brief summary, or abridged entry of any document or instrument on a small piece of paper or parchment. It is chiefly used in law; decrees in chancery, and other legal instruments, being thus docketed for purposes of reference. Attestations or declarations annexed to written instruments are also called dockets, especially such as are done by a notary. A docket is

also a ticket or direction tied to goods.

DOCKYARDS, yards or magazines situated near large harbours, for the purpose of containing all kinds of naval stores, timber, &c., together with all the materials requisite for the building and repairing of ships. Before the reign of Henry VIII, there were neither arsenals nor dockyards belonging to the crown; but to that monarch belongs the credit of having first founded a regular navy, by the establishment of dock-yards, and the formation of a board consisting of certain commissioners. The first dockyard erected in his reign was that of Woolwich. Those of Portsmouth, Deptford, Chatham, and Sheerness followed. Plymouth, and afterwards Pembroke, are more recently formed dockyards. All of these establishments have slips in which new ships are built, sheds and dry docks for repairing vessels, and all the requisites for rigging and fitting them out for sea. Bost-building and mastmaking are also carried on; and in some cases blocks, ropes, and sails are made and anchors forged. A brief description of several of the royal dockyards may give a general idea of their usefulness. Portsmouth dock-yard is considered the great naval arsenal of England, and the head-quarters of the British navy. It is by far the largest of the royal dockyards; and its central station with regard to the opposite coast of France, its safe and extensive harbour, and splendid anchor age at Spithead, all combine to give it prominence. The wharf-wall of the dockyard on the western side of the harbour is 3,900 feet in length; the mean depth may be 2,000 feet, and it incloses an area of more than 100 acres. Within the yard are several large basins with dry docks, double docks for frigates, building slips, &c., attached to them. On the north-east side is a row of storehouses, 500 feet in length; and the south-west side the rigging-house and sail-loft, 400 feet long. There are two hemp-houses and two sea-storehouses, extending 800 feet; while the rope-house, tarring-house, and other buildings connected with the ropery, are on the same large scale. Besides with the ropery, are on the same arge scate. Desides these, there are saw-mills, a gigantic smithery, an iron-mill, a copper-mill, a copper-refinery, in which all the old copper taken from saips; bottoms is melted are relied; and all the bolts, gudgeons, and other articles of copper used in the navy, are cast there. Connected 676

with the dockyard is a naval college, established in 1729, and a naval architectural school, the professor of which has the charge and keeps the rate of all the chronometers belonging to the navy which may not be in use. Woolwich dockyard presents a frontage of in use. Woolwich dockyard presents a froutage of 3,680 feet to the river, to which may be added 180 feet more timber-grove. The breadth is very irregular, but is estimated at between 250 and 900 feet. It has two docks with entrance from the river, and one dock with an entrance from a large basin. There are also with an entrance from a large basin. There are also a three large and two smaller building-slips, besides a boat-pond. Woolwich dockyard is more looked upon as a building-yard than as a store; but it is very com-plete in all the usual appendages of artificers workshops, storehouses, offices, &c. One of the four divisions of marines are stationed at Woolwich, where their barracks are situated. Deptford dockyard had a front wall facing the Thames, about 1 200 fact is least, and had with an entrance from a large basin. are aroused. Deputity docayar, and a rone wan facing the Thames, about 1,700 feet in length, and had an area of about 30 acres. It had three large slips, two smaller ones, and three dry docks. Its principal use was in repairing vessels. Through its proximity to London, however, it became the general magazine of stores and necessaries for the fleet. The principal stores consisted of small cordage, canvas, and ships sails, beds, hair for beds, hummocks, slops and marine clothing; anchors under the weight of about seventyfive hundred, -all above that size being made in the queen's dockyards. In 1870 this dockyard was closed and sold by the Government. It is now being converted into a water-side cattle-market. Plymouth possesses one of the finest harbours in the world, able possesses one of the intest narrows in the word, above to contain in perfect safety at their moorings more than a hundred sail of the line. The dockyard, however, has only one basin; but it is not only a good building and repairing yard, but a good refitting yard. All the dockyards are under the control of the Admiratty; and each is governed by a set of officers, who are responsible to that department. In several dockyards there are arrangements connected with the storing of guns and ammunition. In the estimates for

storing of guins and ammunition. In the estimates for 1869-70 the total cost for dockyards was £1,086,001; in 1870-71, £378,352.

DOCKYARD BATTALIONS.—In the year 1847 the workmen of the various dockyards were enrolled into a corps for the defence of the yards, and a certain number of them were trained to the use of the large guns; so that each of the battalions has artillery atguns; so that each of the battahous has artillery attached to it. Each corps is formed of clerks, artisans, and labourers. The colonel is a naval officer, and commissions are given to the others. This valuable body of men is regularly drilled, the men receiving remuneration for time lost in drilling. Sergeauts and corporals of marines usually superintend the drilling. The uniform consists of blue frock-coats and trowsers, uniform consists of blue froct-coats and trowsers, and a helmet. At first the enlistment in the deckyard battalions was voluntary, but now it is compulsory. The service, however, is very popular, and the list is well filled. When first enrolled, in 1847, the battalions numbered 9,000 men; and an item appeared in the estimates of £20,000 for their training and exercise.

Docros, dok-ter (Lat. doctor, from doceo, I teach), properly signifies a teacher or instructor, one so skilled in his particular art or science as to be able to communicate it to others. It is generally believed to have been first adopted as a distinctive title in the 12th century, and to have originated with the university of Bologue. The university of Paris followed immediately after, and, in 1145, conferred the degree of doctor in divinity on Peter Lombard. In England the degree of doctor was not introduced into the universities till the reign of John or Henry III. In modern times the title of doctor forms generally the highest degree in the faculties of theology, law, and medicine. In Germany, the title of doctor in philosophy has been substituted for the older title of master, which is still retained in this country. The universities of Oxford and Cambridge also confer the degree of doctor in music. As to the conditions and qualifications necessary to obtain this degree, see the accounts of the different universities in other parts of this work.

Doctor IN MURIC, a musician upon whom the demunicate it to others. It is generally believed to have

Dorron universities in other parts of this work.

Dorron in Murat, a musician upon whom the degree of doctor has been conferred by some university.

The name of the first professor to whom this title was granted not being clearly known, the date of its origin in England cannot be clearly demonstrated. According

### Doctors' Commons

to Anthony Wood, it was first instituted in the reign to Anthony Wood, it was first instituted in the reign of Henry II.; while Spelman fixes its foundation in that of John. By the qualifications formerly required of a candidate for either a doctor's or a bachelor's degree, it is clearly shown that music was considered a purely speculative science. No importance was attributed to skill in composition; the ability of reading and expounding Boethius was received as a much the contributed to the the first that the same first that the first that the same first that the first. higher criterion of scientific acquisition than the finest specimen of inventive harmony and melody. By the more modern statutes, however, higher qualifications are rendered necessary; the candidate being required by them to submit for the inspection of the musical professor a composition in eight vocal parts, with instrumental accompaniments.

Doctoss Common. or Collegs of Civilians, is a college, or "common-house," founded by Dr. Harvey, dean of the Arches, about the beginning of the reign of Queen Riuzbeth, for the professors of civil law in London, and is situated near St. Paul's Churchyard. The original building was burned down in the great fire of 1666; but it was afterwards rebuilt in 1672. Besides being the residence of the doctors of the civil law, who all used to live here, as to diet and ledging, in a collegiate manner, "commoning together," it was also the official residence of the judges of the court of Arches of Canterbury, of the Admiralty, and of the Prerogative court, who held their courts here. The only courts that still continue to exercise their The only courts that still continue to exercise their functions here are the court of Arches, the court of Admiralty, the Archdeacon's court, and the court of Faculty. In 1768 the members of this society obtained a royal charter, and were incorporated under the name of "the College of Doctors of Law exercent in the Ecclesiastical and Admiralty courts." The college of the court of the president of the days of the Arches for the Ecclesiastical and Admiralty courts." The college consists of a president (the dean of the Arches for the time being), and of those doctors of law who, having regularly taken that degree in either of the universities of Oxford or Cambridge, and having been admitted advocates, in pursuance of the rescript of the arch-bishop of Canterbury, shall have been elected fellows of the college in the manner prescribed by the charter. Hence no one can be admitted a member, or allowed to practise as an advocate in the courts at Doctors' Commons, who has not first taken the degree of doctor of laws in one of the English universities. Proctors in these courts discharge duties similar to those of solicitors and attorneys in other courts. In order to be admitted a proctor to practise in the court of Arches, it is necessary to have served a clerkship of seven years under articles with one of the senior proctors, who must be of five years' standing, and who is prohibited from taking a second clerk until the first shall have accorded for shall have served five years. The proctors appear in court in black stuff gowns, the advocates wearing wigs, bands, and black silk gowns, exchanged on certain days for scarlet cloth gowns, which, in the case of graduates of Oxford, are bound round with taffeta,—of Cambridge, trimmed with white minever.

Doctrinaire, dok-trin-aire' (fr.), denotes properly a man who is the supporter of a particular doctrine, or who is a man of doctrines. In general, it is used in a had sense, as applied to those who hold pedantic or un-practical views. In this sense it was applied in France, during the Restoration, by the reactionary court party, to a faction of the parliamentary opposition, who wished to carry out rational and scientific doctrines in politics against all arbitrary measures. This party went out from the salons of the due de Broglie, and had, as its leader in the chamber, Royer Collard, being supported in the press and before the public by Guizot. Their watchword was a constitution on the basis of the charter of Louis XVIII. After the revolution of 1830, Guizot, Brogie, and others of this party, became ministers and supporters of the government, and their principles came to be very much the same as those of the then

## Dodo

influence the heart and life. "Thus, the idea of God's sovereignty excites submission; his power and justice promote fear; his holiness, humility and purity; his goodness, a ground of hope; his love excites joy; the obscurity of his providence requires patience; his faithfulness, confidence, &c."

DOGUMENT, dokument (Tat document)

faithfulness, confidence, &c."

Document, dok'-u-ment (Lat. documentum, from doce, I teach, as teaching or showing something), in Law, is applied to any written muniment produced in proof of any feet sesewited.

Dodecacon, do-dek'-d-gon (Gr. dodeka, twelve; gonia, an angle), in Geom., a polygon which has twelve angles and twelve sides. When the angles and the sides are each of them equal, the dodecagon is a regular one and may then he insertibed in or incumercially sides are each of them equal, the dodecagon is a regular one, and may then be inscribed in or circumscribed by the circle, the sum of its interior angles equalling twenty right angles. If the side of a dodecagon be 1, its area will=3×(2+√3), or 11·196 nearly.—In Fort., the term is applied to a place surrounded by twelve bastions. (See REGULAR FIGURE.)

DODRAHIDBON, do-de-kui-he'-dron (Gr. dodeka, twelve; edra, a base), in Geom., one of the five regular solids of Plato, being contained under a surface com-posed of twelve equal and regular polygons or bases. (See REGULAR BODY.)

Dono, do'-do, a gau, of birds said to be now extinct, but of whose existence within the last three centuries there is abundant evidence. When, in 1598, turies there is additional evidence. When, in Addition the island of Mauritius was discovered, the bird in question was so plentiful that the sailors ate the flesh to satiety, as it was easily killed, and its flesh, especially the breast, much relished. It is described as being considerably larger than a swan, weighing sometimes fifty pounds, with a very bulky and heavy form. The bill was long and strong, depressed at the base, with a separate and much arched spical portion, which was so sharp and strongly hooked at the tip that the dodo has been considered by some naturalists as



approaching the predacious birds. The nostrils were placed on the sides of the depressed portion of the bill, which was covered by a naked skin; the face was similarly clothed. The feet, which were very short and stout, bore a considerable resemblance to those of the pigeon. The wings were also very short, and quite incapable of raising the bird in the air, even had they been furnished with the ordinary stiff quil-lifeathers; but, in place of these, they bore a few soft decomposed plumes like those of the ostrich and the teal, and were adorned with a tut of similar but smaller feathers. approaching the predscious birds. The nostrils were piumes like those of the ostrich and the teal, and were adorned with a tuft of similar but smaller feathers. This rudimentary condition of the wings led to the dodo's, being placed among the cursorial birds by many writers. The general colour of the dodo was a blackish grey, but the plumes of the wings were of a light ash-colour. In Tradescant's catalogue ("Museum Religible ash-colour of Religible ash-colour as Calletting Religible research light ash-colour. In Tradescant's catalogue ("Mussum Doctrina, doh'-trin (Lat. doctrina, from doceo, I Tradescantisnam; or a Collection of Rarticise preserved at South Lambeth," by John Tradescant; London, cither as a matter of faith or practice; and hence the 1856), we find, among the "whole birds, doda, from the team has come to be applied to a variety of opinion; that have been adopted and inculcated in religion, philosophy, &c. The doctrines of the Bible are the first brate that this was a dodo there can be no doubt; for we have the testimony of an eye-witness whose ornithological competency cannot be doubted, in the affirmation of religion, and ought to logical competency cannot be doubted, in the affirmation.

dodo, and immediately beneath his translation of Bontius, has the following words:—"We have seen Bontins, has the following words:—"We have seen this bird dried, or its skin stuffed, in Tradescant's cabinet." Le Strange, in his observations on Sir Thomas Browne's "Vulgar Errors," speaks of a dodo exhibited (probably in a caravan) in the streets of Loudon:—"About 1638, as I walked Loudon streets, I am the picture of a street for leave out the streets. I saw the picture of a strange fowl hong out upon a cloth, and went in to see it. It was kept in a chamber, and was a great fowle, somewhat bigger than the lurgest turkey-cock, and so legged and footed, but stouter and thicker, and of a more erect shape; coloured before like the breast of a young cock tesan (pheasant), and on the backe of dunn or deare colour. The keeper called it a dodo, and in the ends of a chimney in the chamber there lay an heap of large pebble-stones, whereof he gave it many in our sight, some as bigg as nutmegs; and the keeper told us shee eats them, con-ducing to digestion; and though I remember not how farre the keeper was questioned therein, yet I am confident that afterwards she cast them all agayne." Tradescant's stuffed specimen passed to the Ashmolean Tradescant's studed specimen passed to the Annuciean Museum at Oxford; but, being allowed to fall to decay, it was, by order of the curators, destroyed in 1755. Luckily, however, the head and one of the feet escaped destruction, and these, together with one other foot, safely stored in the British Museum, comprise the sole known remains of a creature commonly eaten within the last three hundred years.

DOE, JOHN, jon do, in Law, was, previous to the passing of the Common Law Procedure Act (1852), a fictitious personage, who was usually employed as plain-tiff in actions of ejectment against an equally fictitious defendant, Richard Roe. The claimant John Doe served the tenant in possession of the land with a declaration the tenant in possession of the land with a decaration in ejectment against Richard Roc. Subjoined to this declaration was a notice to appear, addressed to the tenant in possession by name, in the form of a letter from Roc, informing him that he, Roc, was sued as a casual ejector only, and had no title to the pre-mises and would make no defence and therefore adas a casual ejector only, and had no title to the premises and would make no defence, and therefore advising him to appear in court and defend his own title, otherwise he, Roe, would suffer judgment to be had against him, and he would thus be turned out of possession. If the tenant in possession did not, in due time, take the proper steps to be admitted defendant in the place of Roe, then upon judgment being given against Roe, the real tenant would be turned out of possession by the sheriff.—Ref. Stephen's Commentaries on the Law of England.

on the Law of England. Dog, dog (Canis familiaris).—To use the oft-quoted words of a great naturalist, "The dog exhibits the most words of a great naturaist. "The dog extinits he most singular, the most complete, and the most useful conquest that man has made. The whole species is become our property; each individual is entirely devoted to his master, adopts his manners, distinguishes and defends his property, and remains attached to him even unto death; and all this springs not from necessity—not from restraint, but simply from gratitude and a true friendship."—(Cuvier.) In all ages the origin of the domestic dog has been a question, and one most difficult of solution, with the most learned naturalists. Some are of opinion that the breed is derived from the wolf; others maintain that it is a familiarized jackal; all agree that no trace of it is to raminarized packal; all agree that no trace of it is to be found in a primitive state of nature. Wild dogs still exist: India furnishes them. There thousands exist in a completely independent state, and without exhibiting any wish to share the dwellings of man, Close observation of these animals, however, throws little light on the subject; and after all it would appear that they are naught else than abandoned canine vaganced. bonds; and in their prowlings about the skirts of the villages they exhibit a fearlessness of human beings that, since it does not spring from ferocity or defiance,

since have resumed some of the characters of the wolf." Mr. Bell, whose opinion on the subject is of high value, says, "In order to come to any rational conclusion on says, 'In order to come or any restonant contents on this head, it will be necessary to escertain to what type the animal approaches most nearly after having for many successive generations existed in a wild state, removed from the influence of domestication and of association with mankind. Now we find that there are several distinct instances of the existence of dogs in such a state of wildness as to have lost even that common character of domestication,—variety of colour and marking. Of these, two very remarkable ones are the dhole of India and the dingo of Australia; there is, besides, a half-reclaimed race among the Indians of North America, and another, also partially tamed, in South America, which deserve attention; and it is found that these races, in different degrees, and in a greater degree as they are more wild, exhibit the lank and gaunt form, the length of limb, the long and alender muzzle, and the great comparative strength which characterize the wolf; and that the tail of the Australian dog, which may be considered as the most remote from a state of domestication, assumes the slight bushy form of that animal. We have here, then, a considerable approximation to a well-known wild animal of the same genus in races which, though doubtless descended from domestic ancestors, have



DALMATIAN DOG.

gradually assumed the wild condition; and it is worthy of especial remark that the anatomy of the wolf, and its osteology in particular, does not differ from that of the dog in general more than the different kind of dogs do from each other. The cranium is absolutely similar, and so are all, or nearly all, the other abscillety similar, and so are all, or nearly all, the other essential parts; and to strengthen still further the probability of their identity, the dog and the wolf will readily breed together, and their progeny is fertile. The obliquity of the position of the eyes in the wolf is one of the characters in which it differs from the dog; and although it is very desirable not to rest too much on the effects of habits or structure it is not perhaps effective the point structure, it is not, perhaps, straining the point to attribute the forward direction of the eyes in the dogs to the constant habit for many successive generations of looking forward to their master, and obeying rations of footing forward to their master, and oveying his voice." The latter part of this argument is, however, of too theoretic and speculative a character to carry weight, or, as some insist, to be worth weighing. With regard to the alleged untamably savage disposition of the wolf, Mr. Bell disposes of the objection by specifying two olf, when his disposes one of which is of a she-wolf that, since it does not spring from ferocity or defined, would seem to betoken a confidence in man never to be found in the roaming wolf or jackal. In certain Bastern cities, again, the canine prowlers are very numerous, and sometimes dangerous to approach, on account of their ferocity. This, however, is small proof of their wolfsh origin. As Colonel Hamilton Smith truly observer, "If domestic dogs were merely wolves modified by the influence of manie wants, surely the curr of Mahamedan states, released domestic care, and small proof of the subspace of the surely to the dog and the wolf, is the sale of their wolfsh origing them to the bars of her truly observer, "If domestic dogs were merely wolves modified by the influence of manie wants, surely the life out of the whole of her precious modified by the captesia care, and only solerated in the capacity of seawengers, would long fact that in both the period of gestation is the same, relating two anecdotes, one of which is of a she-wolf confined in the gardens of the Zoological Society in the Regent's Park. This creature, who had pups was constantly in the habit of bringing them to the bars of her den that they might be caressed by the visitors, till at length through content of first the habit.

sixty-three days. The young of both wolf and dog are born blind, and see at the same, or about the same time, namely, at the expiration of the tenth or twelfth day. A satisfactory classification of the different kinds of dog has not yet been arrived at. What some naturalists regard as types, others regard as mere mongrel races. It is hard to found a principle of arrangement; form does not afford it, neither does the character of the fur; kinds that are totally dissimilar associate as easily as those that are closely allied. One of the best arrange-ments is that made by Colonel Hamilton Smith, wherein the demestic dogs are grouped in six sections:—I. the Wolf-dogs, including the Siberian, Iceland, Esquinaux, Newfoundland, Northe, sheep, great wolf, Great St. Bernard, Pomeranian dog, &c.; 2. Watch and Cattle dogs, including the German boar-hound, Danish dog, matin, dog of the North American Indians, James and, mann, dog of the North American Indians, &c.; 3. the Greyhounds, including the Brinjaree dog, different kinds of greyhound, Irish hound, Inrcher, Egyptian street dog, &c.; 4. the Hounds, including the bloodhound, old Southern hound, staghound, foxhound, harrier, beagle, pointer, setter, spaniel, springer, cocker, Blenheim dog, water-dog, or poodle, &c.; 5. the Cur dogs, including the terrier and its allies; 6. the Mastiffs, including the different kinds of mastiffs, bull-dog, pue-dog, &c.

Instiffs, bull-dog, pug-dog, &c.
Dog-days. (See Canicular Days.)
Dog-fish (Seellinus catalus), the common name of come of the smaller species of shark. The best known is the picked dog-fish, which is found in the European seas, and attains a length of about three feet. It belongs to the family Spinacida, of which one characteristic is the presence of a spine before the two dorsal teristic is the presence of a spine before the two doesnatins. The body is long and tapering; the bend flat; the snout conical; the teeth in both jaws sharp-edged, and formed for cutting. The tail fin is longer than it is troud. The upper parts are slate-grey, the under parts yellowish white. To use its spines ellensively, the dog-flish bends itself into the form of a bow, and by a sudden motion causes them to spring usunder in an opposite direction. It sometimes appears in prodigious numbers: twenty thousand have been taken in a net at one time off the coast of Cornwall. They are said to afford the best food of any of the sharks, and are commonly brought to the markets of sea-side towns. The flesh is often dried. The liver yields oil, and the refuse parts are used as manure. It causes great au-novance to fishermen by cutting the hooks from their fishing-lines.

DOG-STAR. (See LAUNCHING.)
DOG-WATCH, in Mar., are the two reliefs which take
place between four and eight o'clock r.m., each of
which being only two hours on deck. The intention of these watches is to change the turn of the nightwatch every twenty-four hours, so that the party watching from eight till twelve in one night shall watch from midnight till four a.m. on the succeeding one.

Dog-wood Bark. (See Convus.)

Dogz, doje (Ital., from the Lat. dux, a leader), the

title of the chief magistrate in the republics of Genoa and Venice. The dogate, or office and dignity of doge, was elective; the doge of Genoa being elected for two years, and at Venice for life. The office was originated in the latter city in the year 697. When the seven years, and as venice for life. The office was originated in the latter city in the year 497. When the seven tribunes by whom state affairs had been previously administered were found unequal to their posts, the Venetians resolved to replace them by a single chief magistrate, who should hold office for life. The doge was chief of the compail flust incident. was chief of the council, first minister, and personal representative of the republic; but, though invested with almost regal authority, he was not a sovereign. He could convoke assemblies, declare war, or conclude treatics, command the armies of the state, appoint the treatics, command the armies of the state, appoint the military tribunes and the judges, collect citizens, hear appeals, decide disputes between the clergy, award ecclesiastical purishments, invest bishops, and instal them in their churches. Notwithstanding these vast powers, a perusal of the history of Venice will prove, that though the Venetians allowed four centuries to clapse before they fixed the bounds, or controlled the exercise of the power of their chief magistrate, that, after that time, the doge was merely the representative of an authority which was actually reserved to the republic. In fact, he was a state pageant, who lent the

weight of his name to the acts of the senate. He could give addience to ambassadors, but not make any answer to them as from himself on matters of import-All credentials with which the senate furnished ance. All credentials with which the senate infiniteration ministers to foreign courts, though written in his name, were not signed by him, but by a secretary of state, who sealed them with the arms of the republic. Dispatches were directed to him by ambassadors, but he country than agreet in presented of the country. could not open them, except in presence of the councillors; and, although money was struck in his name, it did not bear his stamp or arms. He could not go beyond Venice without permission of the council. His children and brothers were excluded from all the chief offices of state; and so jealously did the republic regard the chief they had themselves elected, that the doge of Venice was, politically speaking, a nonentity. He could not divest himself of his dignity at will; and He could not divest himself of his dignity at will; and at his death, three inquisitors and five correctors examined into his conduct with the most scarching rigour. The personal history of the doges is inseparably incorporated with that of the republic of Venice; and the office, after an existence of eleven hundred years, yielded, with but a slight resistance, to the power of the republic of France.—Ref. Quarterly Review, vol. 31; Edinburgh Review, vol. 46; Daru's Histoire de la République de Venice, 8 vols. 8vo, Paris.

Doggen, doggen; Oly, Ja, as mall ship or fishing.

Dogger, dog'-gar (Du.), a small ship or fishing-vessel, navigated in the German Ocean, and built after the Dutch fashion, with a narrow stern, a main-mast and mizer-mast. It is principally used for fishing on the Dogger Bauk, an extensive sand-bank in the German Ocean, between England and Germany.

DOGGEREL, dog-yer-el (Ang.-Sex.), a term applied to mean, pairry, loose, and irregular rhymes, where the jingle at the end of each line is the only thing preserved in common with verse or poetry. Shakspere, in "As you like it," gives an example of it, where Touchstone says, "I'll rhyme you so eight years together, dinners and suppers, and sleeping-hours excepted. It is the right butter man's rank to market,-

> " If a hart do lock a hind, Let him seek out Rosalind. If the cat will after kind, So, be sure, will Rosalind. Winter garments must be lined, So must slender Rosalind," &c.

DOGGET'S COAT AND BADGE, dog'-gets, a prize contended for at a rowing match upon the Thames on the lat of August every year. Thomas Dogget, an actor at the theatre in Drury Lane, desirous of commemo-rating the accession to the throne of George I. (Aug. 1, 1715), left a bequest of a waterman's coat and badge to be rowed for annually. At the present time several to be rowed for annually. At the present time several prizes are rowed for on the same day. In 1861, after Dogget's coat and badge, the second and third prizes were respectively five-eighths and three-eighths of the interest of £260. 17s. 3d., formerly £200 South-Sen stock, left in the will of Sir William Joliffe, the amounts being respectively £4. 17s. 9d. and £2. 18s. 9d. The prizes for the fourth man was £1. 11s. 6d. and for the fifth and sixth men, each £1. 1s.: the last three prizes were given by the Fishmongers' company. The company are six young waterman whose amount intereshing petitors are aix young watermen whose apprenticeships have expired within the year. The locality chosen for the race is from London Bridge to the Old Swan at Chelsea. The umpire is usually the barge-master of the Fishmongers' company, and the rowers are each placed with graphs. The placed singly in a boat provided with sculls. The match excites great local and general interest, and the skill exercised, and the speed attained by the rowers, are extraordinary.

DOGMA, dog'-ma (Gr., an opinion or notion), originally meant an opinion given out as a positive assertion, not requiring to be supported by any arguments; and hence a settled opinion, a principle, maxim, or tenet, particularly in theology or philosophy. In English, the term is frequently applied in a deprecia-English, the term is frequency appared in deprecia-tory manner to assertions advanced without proof. In a theological sense, it is applied to the doctrines of Christianity advanced not for discussion but for belief; hence dogmatic theology is that branch of divinity that systematically arranges and expounds the various doctrines of Christianity, as distinguished from scho-

lastic theology, which deals with the arguments by which the truth of these doctrines may be supported. which the truth of these doctrines may be supported. The first attempt to furnish a complete and coherent system of Christian dogmas was made by Origen in the 3rd century, in his work "De Principiis." He was followed, in the 4th century, by Augustine, with his work, "De Doctrina Christians." The first, however, to treat this subject systematically was John Damascenus, who flourished in the 8th century. In the middle ages ingenious examinations of the Christian doctrines were made by the schoolmen; but agitating, as they did, subtle questions of little practical importance, they loaded the science with useless refinements. Among the Protestant reformers, Melancthon was the first who wrote a compendium of the Christian doctrine, which is still justly esteemed. The spread of the critical philosophy of Kant gave a fresh stimulus to this branch of theology in Germany, and since that time it has been extensively cultivated in that country. The most recent important work on this subject is that of J. Peter Lange, "Philosophische Dogmatik" (Heidel, 1849-51). Several Roman Catholic theologians in Germany have recently distinguished themselves in this field, some inclining to liberal notions, and others supporting the rules of the Church. It is worthy of remark that Nitsch and Beck have, in recent times, treated Christian dogmatics and morality in doctrines were made by the schoolmen; but agitating, times, treated Christian dogmatics and morality in combination, the custom having been for the last two centuries to discuss them separately .- Ref. Conversations Lexikon

DOGMAS, HISTORY OF, or, the History of Opinions, is a branch of ecclesiastical history which is more cultivated in Germany than here. "The history of cultivated in Germany than here. "The history o dogmas," says Neander, "traces the generic develop ment of Christian doctrine; it shows in what forms the ment of Christian doctrine; it shows in what forms the same Christian truth has been developed as doctrine, and the relation of these forms to one another and to Christianity itself. . . The history of dogmas is distin-guished from the history of Christian truth, as it stands in the original records, which is to be regarded as the peculiar province of New Testament theology, and especially of New Testament dogmatics. . . It is also bounded at another point by the representation of the condition of the Church at the present time, which is the business of statistics. The history of dogmas relates, therefore, to the development of Christian doc-trine in the intermediate period between pure apostolic Christianity and the church of the present day. object is to exhibit in an historical way the origin and the changes of the various Christian systems of belief, showing what opinions were received by the various sects in different ages of Christianity; the sources of the different creeds; by what arguments they were attacked and supported; what degrees of importance were attached to them in different ages; the circumstances by which they were affected; and the modes in which they were combined into systems. It is easy to see how important and interesting a study this is, teaching, as it does, modesty and forbearance in the support of particular opinions, by showing the vast variety of those which have afforded subjects of bitter controversy at particular periods, and have then passed away into oblivion. It shows farther, the process of culture which the human mind has experienced under the influence of Christianity, the conflict of truth with error, and the triumph of the former over the latter. The history of dogmas stands in very close connection with the history of the Church, and was formerly regarded merely as a department of it; but on account of its wide extent and importance, it is now generally treated as a distinct science. In church history, dormas are not noticed till their influence has been

periods then treated separately. Historians, however, differ greatly as to the number and limits of the different periods. The following are those adopted by Hagenbach :- 1. From the close of the Apostolic age to Hagenbach: —1. From the case of the Apologetics; the death of Origen (80–254),—the age of Apologetics; 2. from the death of Origen to John of Damascenus (240–730),—the age of Polemics; 3. from John Damascenus to the Reformation (730–1517),—the age of Systems (scholasticism in its widest sense); 4. from the Reformation to the abolition of the Formula Consensus in reformed Switzerland, and the rise of the Wolfian philosophy in Germany (1517—1720),—the age of Polemico-ecclesiastical Symbolism; 5. from the year 1720 to the present day,—the age of Criticism, of Speculation, and of Antithesis between faith and knowledge, philosophy and Christianity, reason and revelation.—Ref. Hagenbach's History of Doctrines; Neander's Lectures on Dogmas.

DOGMATISTS, dog'-ma-tists, were a sect of ancient physicians, called also Logici, or logicians, from their employing the rules of logic and reason in their pro-fession, as distinguished from the empirics. They treated medicine as a speculative science,—defining, dividing, laying down principles, and drawing conclu-sions. They reduced diseases to certain genera, and these genera to species, and furnished remedies for

them all.

them all.

Dorr, doyt (Du. dayt), a small piece of Dutch copper
money, in value the eighth part of a stiver, or half a
farthing. In Scotland, during the reign of the Stuarts,
the doit was the penny piece, twelve of which were
equal to a penny sterling. Shakspere, in "Coriolanus,"
makes allusion to it as a thing of the least value.

Dolog, or Dol., dol'-chai (Ital.), a term in Mus.,
used to denote that the passage over which it is written
is to be played in a soft, smooth, and delicate manner.

is to be played in a soft, smooth, and delicate manner. In instrumental music, this term is generally applied to those portions of melody which are so peculiarly adapted to the voice that the performer cannot express them better than by taking the vocal tones as his

Dole, dole (Lat. dolus, guile), a term used in Scotland, denoting the amount of conscious guilt or evil intention necessary to make a legal crime. It corresponds with the English term felonious intent. Doli incapax is one who is incapable of dole, or incapable of consent.

Dolertin, dol'-cr-ite, in Min., a mineral composed of felspar and sujike. It is a variety of greenstone.

Doles at Funerals, doles, an ancient custom of making gifts to the poor at funerals, which was in use making gitts to the poor at transrat, which was in use till comparatively modern times. It was continued until long after praying for the dead had been abandoned at the Reformation. The custom probably arose from the opinion that such gifts did give repose to the soul of the deceased. In Nichols's "History of Leicestershire" he thus speaks of the custom in connection with the village of Strathern.—"In 1790 there were 432 inhebitives the number takes by the latterners. inhabitants, the number taken by the last person who carried about bread which was given for dole at a funeral,—a custom formerly common through this part of England, though now fallen much into disuse. The practice was sometimes to bequeath it by will; but whether so specified or not, the ceremony was seldom omitted. On such occasions a small lost was sent to omitted. On such occasions a small lost was sent to every person, without distinction of age or circumstances; and not to receive it was a mark of particular disrespect." The practice of giving doles at funerals was not only common in England, but also in Wales, Scotland, and Ireland. By some the custom is traced back to the sin-offering amongst the ancient Hebrews.

Doll, doll (Welsh delor), a toy, shaped like the figure of an infant, used by children of both serse, but mostly by female children, whose love of dolls not only cultivates their affections, but teaches them to dogmas are not noticed till their influence has been greatly extended, while in the history of dogmas conflicting opinions are traced to their germ; the latter gropes its way to their hidden origin, the former only concerns itself with them as outward embroilments of controversy. The history of dogmas further for the transition from ecclesiastical history apart of the education of girls, whose natural instincts forms the transition from ecclesiastical history and love of nursing are exhibited from their tenderest age. The use of these little effigies dates from the the history of dogmas two methods of arrangement may be followed,—either the order of time, or according to the nature of the events. Each of these methods has its advantages and disadvantages, and generally the two are combined; certain epochs or of the Australian aborigines, the love of the imitation of the cares of maternity is equally implanted. The

## Dollar

majority of the dolls imported into Great Britain come from the Netherlands. The old Dutch or Flemish doll had a well-made face, a gaudy dress, and thin wooden legs. Great improvements have recently taken place in the manufacture of dolls, and large quantities are made in France, on the Bhine, and in Switzerland, as well as in England; and many hundred women are employed in their construction; some of whom carve employed in their construction; some of whom carve the faces, others the figures, others the limbs; another class of operatives paints them, and another prepares and puts on the dresses. In 1861 there were twenty-three master doil-makers in London, one of whom manufactured them entirely of gutta-percha. Wires and machinery have been introduced into the bodies of the dolls, that make them open and shut their eyes, and imitate the sound of the words "papa," and "mamma." Since the accession of the queen, blue eyes have been generally inserted in the heads of dolls in England; but on the continent and expensible in in England; but on the continent, and especially in Spain, black eyes are the favourites. In America, black dolls are made of gutta-percha, expressly for the use of negro children.

negro children.

DOLLAR, dol'-lar (Ger. thaler, Du. daulder), the name of a coin of the states of America, whose value in the scale of coins adopted is equal to 100 cents, 10 dimes, or ,; of an eagle. The American dollar, which was taken from the old Spanish dollar, or pisatre, was formerly only of silver; but since 1849, a considerable issue of gold dollars has taken place. The American dollar is estimated in exchange at 3s. 2d. sterling. The Prussian dollar, or thaler, is worth 3s. sterling: in other

dollar is estimated in exchange at 4s. 2d. sterling. The Prussian dollar, or thaler, is worth 3s. sterling; in other parts of Germany the value of the dollar varies.

DOLLY-SHOP, dol'-le, the name applied in London to a shop where rags, old articles, and refuse, are bought, and over the door of which is usually suspended a large black doll. Dolly-shops are often kept as cloaks for an illegal trade. A small sum is advanced upon articles, which the seller has the option of repurchasing a few days after at a higher price; and thus a large a few days after at a higher price; and thus a large profit is derived from a system of unlicensed pawn-broking.

DOLMEN, dol'-men, the name given by French archæologists to the monumental records crected over Celtic nurial-places in Great Britain and France, which are called connects in Great Britain and France, which are called connects in this country. (See Curnic Architecture.) The word is supposed to be the Celtic term for a stone table. The neighbourhood of Saumur, on the Loire, in the department of the Maine and Loire, is rich in Druidical remains, and one of the most respectable department that the source of the most respectable department. markable dolmens that are known is to be seen there. It is called the Pierre converte, and consists of a rude structure of four broad thick stones, covering an area of about sixty-five feet in length by fifteen in breadth, and supported on ten unlewn blocks about six feet

high.

DOLOMITE, dol'-o-mits (from Dolomieu, a French geologist), in Min., a crystalline variety of magnesian limestone, differing from the ordinary varieties, which are compact and amorphous. The crystalline structure is generally supposed to result from igneous influence a Dolumin, dol'gin (delphims).—This fish bears a great resemblance to the porpoise, but has a much longer and sharper smout. The teeth in both jaws are nearly conical, though some of the species lose those of the upper jaw at an early age. They are very vo-



DOLPHIN.

racious, and are said to prey not only on fishes, medusæ. &c., but also on the wounded and feeble of their dusg. &C., Dut uses on the wounded and feeble of their own species. They live, however, in herds, which often delight the voyager in the ocean solitude by the gambols which they perform around his ship. "They may be discovered," says a celebrated naturalist, "at a great distance, as they are continually leaping from the great distance, as they are constituently coupling at one the surface of the sea, an action which, as it seems to have no obvious object, is probably the mere exuberance of animal mirth. When a shoal is seen thus frolicking at

## Domesday Book

the distance of a mile or two, in a few moments, having caught sight of the ship, down they come trooping with the velocity of the wind. When arrived, they display their agility in a thousand graceful motions,—now leap-ing with curved bodies many feet in the air, then darking through a wave with incredible velocity, leaving a slender wake of whitening foam under the water; now the thin back fin only is exposed, cutting the surface like a knife; then the broad and muscular tail is elerated as the animal plunges perpendicularly down into the depth, or dives beneath the keel to explore the oppo-site side." It is said that in these gambols the dolphin has been known to leap out of the water to such a height as to fall on the deck of a ship.

height as to tail on the deut of a sing.

Dom. (See Don.)

Dom.noc. (See Doomnoon.)

Dome, dome (Gr. doma, Lat. domum, Ital. duomo, a house; but, in the last-named language, applied to cathedrals and churches, as the house of God), in Arch. thedrals and churches, as the house of God), in Arch., a word which expresses any covering placed over a building and taking the form of a hemisphere or spherical vault, whether round or polygonal, at the base. A distinction should properly be made between the terms dome and cupola,—the former applying to the exterior, or convexity of the covering, and the latter to its interior surface, or concavity; but they are generally used as synonymous expressions. In building a dome of masonry, its thickness should be the greatest at the base, which is the weakest part, and gradually diminish towards its crown or centre. The lower courses of masonry should also be strengthened by hooping or framing, particularly if the diameter of by hooping or framing, particularly if the diameter of the base be considerable. The principles on which the equilibrium of a dome is maintained are similar to those on which the equilibrium of arches depends. (See EQUILIBRUM OF ARCHES.) They are put toge-ther on centerings of elaborate construction; but these serve rather as a scaffold for the workman than as a support for the materials of which the dome is made, until the crown is inserted. The use of the dome was not resorted to by the Egyptians, Assyrians, and Greeks; but the Romans, who were the first to use the arch to any great extent, also erected circular vaulted roofs or domes over many of the temples of their heathen gods; among which may be named those of Bacchus, Apollo, Minerva, and Diana, and the mag-nificent Pantheon at Rome. They also covered the chambers of some of their splendid baths with roofs built in this form; as in the baths of Caracalla and Diodetian. In Byzantine architecture, the dome was a peculiar feature in all cathedrals and churches built after that style, and amongst these the dome of St. Store that style, and amongst these the dome of St. Sophis, at Constantinople, may be especially noticed. (See BYZANTIES ARCHITECTURE.) The majority of the Italian churches built during the middle ages are also surmounted by domes. The great dome of St. Peter's at Rome was designed and partly built under the superintendence of Michael-Angelo. Among the most remarkable dense of more modern construction most remarkable domes of more modern construction may be mentioned those of the Invalides and the Pantheon at Paris, and those of St. Paul's, by Sir Christopher Wren, the reading-room of the British Museum, and the Exhibition building of 1862, in London. The following are the dimensions of some that have been already mentioned, with one or two additions, giving the height in feet from the base to the centre, and the diameter of the base, including the thickness of the walling or materials between the outer and inner sur-

NAME	Height.	מ	iameter	٠.
Pantheon, Rome	. 143			•
Buths of Caracalla, Rome	116		112	
Baths of Diocletian, Rome	. 83		74	
St. Sophia, Constantinople	201		115	
S. Maria del Fiore, Florence	310		139	
St. Peter's, Rome	. 330		139	,
Invalides, Paris	. 173		80	
Pantheon, Paris	. 190		67	
St. Paul's, London	. 215		112	
British Museum, London	. 106	• • • • • •		
Exhibition Building, 1862, London	1 100		160	
- Def Tonousnon's Handbook of	Amabitan		T2 - 1.2	

-Ref. Fergusson's Handbook of Architecture; Robison's Mechanical Philosophy; English Cyclopadia-Arts and Sciences.

the most ancient and valuable records of England, framed by order of William the Conqueros, to serve as the register from which judgment was to be given upon the value, tenure, and services of lands therein described. According to some historians, the curve was the class of the conditions of the con begun in 1080 or 1083; according to others, at the close of 1085. The book itself records its completion in 1086. The work appears to have been known by the other names of Rotulus Wintoniae (Roll of Winchester), Liber de Wintonia (Book of Winchester, in cousequence of its being at one period preserved in that city), the Liber Censualis Anglia (Rate-book of England), Scriptum Thessuri Regis (Record of the King's Treasury). The origin and object of the record are best described by the author of the "Saxon Chronicle," a contemporary work. He states, that in the nine-teenth year of the Conqueror's reign an invasion was apprehended from Denmark, and the military consti-tution of the Saxons being then laid aside, and no other introduced in its stead, the kingdom was wholly defenceless, which occasioned the king to bring over a large army of Normans and Britons, who were quartered upon every landholder, and greatly oppressed the people. But the danger having passed away, the king held a council, to inquire into the state of the nation; the immediate consequence of which was the compila-tion of the "Domesday Book," or Great Survey, which was finished in the succeeding year, at which period the king, attended by all his nobility, held a court at Sarum, where all the principal landholders submitted their lands to the yoke of military tenure, became the king's vassals, and did homege and fealty to his person. The formation of the record took place thus : persons called the king's justiciaries visited the greater part of the kingdom and obtained the required particulars, on oath, from the sheriffs, lords of manor, parish priests, reeves of hundreds, bailiffs, and villeins of each vill. The record contained a list of the bishops, churches, religious houses, great men, king's manors, king's tenants in capite, and under-tenants; the particu-lars of the name of each place, its holder, its extent, the extent of wood, meadow, and pasture, the ponds and mills, the quantity of live stock, the value of the whole, the homages of each manor, the number of villeins, cotarii, servii, and freemen, and how much each freeman or socman had. Three estimates of the estates were made; viz., as they were in the time of Edward the Confessor; as they in the time of Laward the Contessor; as they were bestowed by William, and as they were at the time of the survey. Moreover, the juriors were required to state whether any advance could be made in the value. The returns of the justiciaries were sent to Winchester, and being there digested, were entered in two volumes, which were carried about with the king and great seal, or deposited in a chapel or vault of the cathedral, called domus Det. From this last circumstance the name Domesday is thought to be derived; while others ascribe it to a parallel between the de-cisions of the book and those of the day of doom. The first volume, called the "Great Domesday, of 382 folio pages, closely written on vellum, and conor 382 folio pages, closely written on veilum, and contains the survey of thirty-one counties. The second, cr "Little Domesday," is a quarto volume of 450 pages, and comprises the returns from Essex, Suffolk, and Norfolk. It contains also a list of "invasions," or lands possessed without royal authority. Neither Northumberland, Cumberland, Westmoreland, nor Durham, appears in the record; for which various reasons are accorded. Other counties are described either whells. assigned. Other counties are described, either wholly or in part, under adjacent divisions. No account is given of either London or Winehester. As a census of the population, the Domesday Rook is of a constant. the population, the Domesday Book is of no value; but with regard to the ancient tenure of lands its authority is supreme. It mentions only 1,400 tenants in capite. and 8,000 under-tenants, and names a total population of 292,242. The book is now preserved in the chapter-house at Westminster. A fac-simile of it was published house at Westminster. A fac-simile of it was published in 1783 by order of the government. It was ten years in passing through the press. In 1816 the commissioners of public records published two supplementary volumes, with a valuable introduction by Sir Henry Ellis. The first volume was taken up with the general introduction; the second volume contained four similar records as the Demeaday; viz., the Econ Domesday, and the the Inquisitio Eliensis, the Winton Domesday, and

the Boldon Book. These last records were valuable, as tending to supply what was deficient in the older and more famous Domesday-book. It is under contemplation to publish a fac-simile edition of the record.

—Ref. A General Introduction to Domesday-book, by Sir Henry Ellis: England under the Norman Occupa-tion, by Mr. J. F. Morgan.

DOMESTIC ARCHITECTURE, do-mes'-tik (Lat. domestious) .- The domestic architecture of every nation is eatly influenced by the degree of civilization to which it has attained, the climate and situation of the countries and quatoms of try, the national and social manners and customs of the people, and the materials for building which can be most readily procured. In any case, the external appearance and architectural design of any dwellingspectance an architectural design of any aventury, house, whether it be a palace or a cottage, should be adupted to its local position, being mainly governed by the surrounding scenery, the materials that may be at hand, and sometimes by the style of the houses that may be in juxtaposition with it; while the internal arrangements must be controlled in a great measure by the circumstances, habits, and position in life of the family for whose occupation it is intended. But in dwelling-houses of an ordinary class, however desira-ble architectural display and ornamentation may be when judiciously used, it is necessary that the comfort and convenience of the interior should be regarded before the external appearance, particularly when the builder is limited in his outlay; and the money which is too often wasted on the decoration of the outside should be spent in making the sleeping apartments a foot or two higher, and the attics less confined in space. The chief points to which attention should be paid in choosing a site for a house and erecting the building have been mentioned elsewhere. (See BUILDING.) To enter into details on a subject that occupies so great a range, and involves so many points that are worthy of consideration, would be manifestly impossi-ble; and it would be equally fulle to attempt to point out any particular style of building, as regards the exterior or frontage, or any method of arranging the interior, when so many matters have to be thought of that directly refer to the locality in which the building is to be erected, and the purposes which that building may be intended to serve. It will be sufficient, therefore, to direct the reader to those works which will give him an insight into the form of English houses since 1100 to the present time, at different periods of our history; and the most suitable hints for the erection and design of houses, whether for private residences or for business purposes, either in town or country. Fig. 1, Plate XL., is the elevation of a baywindow on the ground-floor, in the Domestic Gothic style. Fig. 2 of the same plate is a front elevation of

principal door to a house in the same style.

DOMICILE, dom'e-sile (Lat. domicilium, from domus, a house), in Law, is the place where a person has his home. What constitutes a man's domicile in a legal sense is a question that has given rise to many difficul-ties, and is marked by many subtile distinctions. In general, a man's domicile is "where he has placed his hearth and centred his fortunes." The domicile of the parents is that of the child; and if a child be illegiumate, it follows the domicile of its mother. A married woman follows the domicile of her husband, and a widow retains the domicile of her late husband till she acquires another. A married man's domicile is generally taken to be where the residence of his family is; and in general the place where a man lives is to be taken as his domicile, unless there be evidence to the contrary. Every person of full age who removes from one place to another with the intention of making the latter his permanent residence, constitutes it his domi-cile; but it is held that the former domicile is not lost till the new one is acquired animo et facto. It is an established principle of the English law that domicile of origin must prevail until the party has not only acquired snother, but has manifested and carried into execution an intention of abandoning his former domi-

#### Dominican Friars

proprietor may have taken place. A will, to be valid, must be executed in conformity to the law of the country where the testator was domiciled; and the realidity of a marriage depends upon its being in conformity with the law of the country in which it took place, provided the parties were bond fide domiciled

DOMINICAN FUIARS, dom-in'-c-kan, an order of friars first instituted by Dominic de Guzman, at Toulouse, in 1215. About the year before he had, together with Diego de Azebes, endeavoured to convert the Albigeness in the south of France by preaching. Feeling that the immorality of the clergy and the ignorance of the population were great aids to heresy, he instituted the order of the Dominicans for the purpose of preaching and converting. The order was confirmed by Innocent III. and Honorius III., in 1216. Before that time, however, Dominic had found that preaching had little effect upon the Albigenees; and, at his instigation, the pope proclaimed a crusade against the "heretics." barons of France were summoned to join, and horrible slaughter was committed on these unfortunate people. Dominic himself is not said to have been a harsh or cruel man, but merely led blindly away by bigotry and religious passion. The members of his bigotry and religious passion. The members of his new order wore a white garment similar to that worn by the Carthusians, with a black cloak and a pointed black cap. Five years after their institution they took Diack cap. Five years after their institution they fook the vow of poverty, and in the following year Dominic died. He was canonized by Gregory IX. in 1233. Another Dominican order was established in 1224, called the Knights of Christ. Its object was to suppress heresy by force of arms. The title of the order was afterwards changed to that of the Penitents of St. Dominic. rights and privileges. The original order increased rapidly in numbers and influence. Within six years Within six years after their institution they had spread into England, led by Gilbert du Fresney, and founded a monastery at Oxord. They also made their way into Scotland, where they were well received by Alexander II. In England they were always called the Black friars, and many traces of them are to be observed in nearly every town. In France they were called Jacobins, from the fact that they first located themselves in the Rue St. Jacques,—in the Latin, Jacobus. They the Rue St. Jacques,—in the Latin, Jacobus. They produced several famons scholars; Albertus Magnus, Thomas Aquinas, and Raymund de Pennaforte, being amongst the number. Their great rivals were the Franciscans. At the present day, the order of Dominican sonly flourishes in Italy, France, Hungury, Switzerland, and America. Dominican uns have also existed contemporaneously with the friars. There are several of their convents on the continent,

Domino, dom'e-no, a long robe of black silk furnished with a hood removable at plensure, and used as a dis-guise by persons of both sexes, chiefly at masquerades. The name domino was doubtless derived from the habit worn by the priests upon their heads and shoulders during winter; from whence sprung the association with a word frequently occurring in the liturgy of the

Roman Catholic church.

DOMINORS, a game generally played with twentyeight flat oblong pieces of ivory or bone, each divided by a line into two parts, bearing numbers marked by points. The game is won by the player who plays out all his tablets or dominoes first, or, if that is impossible, the player who has the least number of points on the dominoes left in hand. The game of dominoes is sup-posed to be very ancient; it has been traced back to Greek, Hebrew, and Chinese origin. At the beginning of the 18th century it was introduced into France from

of the 18th century it was introduced into France from Italy, and, after becoming very popular there, it spread into Germany and generally over the continent.

Don, don (from the Lat. dominus, lord), a title of honour in Spain and Portugal. In the latter country no person can assume the title of don without permission from the king. This mark of distinction and nobility was first conferred upon Pelayo, in the beginning of the 8th century. It is frequently found in the works of Chaucer, under the old English form of the work don.

of the word, dan.

Donari's Comer, do-na'-le, a brilliant comet discovered at Florence by an Italian astronomer, named

#### Donatists

be nearly 230,000,000 of miles distant from the earth. It became visible to the naked eye in the beginning of the September following, reaching its perihelion about the 30th of that month. It reached the point in its orbit nearest to the earth on Oct. 10, when the diameter of its head appeared to be about 100,000 miles, and that of the nucleus 800 miles. When it first became visible without the aid of a telescope, its tail appeared to be 14,000,000 of miles in length, gradually increased to 51,000,000 on Oct. 10, the tail seemed to cover an arc of 40°; but as it went away from the earth, the length of this part of the comet diminished with greater apparent rapidity than

it had previously increased.

DONATION, do-nui-shun (Lat. donatio, from done, I give), is the act of giving or bestowing; also, a gift. A donation, to be valid in law, supposes a capacity both in the done to give and in the done to receive. It distinguishes between a donation into the done. the donor to give and in the donee to receive. It dis-tinguishes between a donatio inter vivos and donatio mortis causa; in the former case a gift, to be valid and binding, must either be accompanied by the solemnity of a deed, or by that of delivery of possession; and when so perfected it is not in the donor's power to retract it, though a mere gift, unless it be prejudicial to creditors, or the donor were under some legal inca-pacity, as infancy, coverture, or the like. A donatio mortis causa is when a person in his last sickness, apprehending his dissolution near, delivers, or causes to be delivered, to another the possession of any personal goods to keep in case of his decease. The gift being made only in contemplation of death, implies that if the donor lives, it shall revert to himself, and consequently it partakes of the nature of a legncy. If the donor dies, it needs not the assent of the executors, but it is of no avail against creditors in case of a deficiency of assets. To be effectual, it must be accompanied by a delivery of the chattels; or if it be in action, and not in possession, the delivery of the instrument by which it is secured. As it takes effect from the delivery, it is not a testamentary act, and does not come within the jurisdiction of the ecclesiastical courts, nor require probate or administration.

DONATISTS, do'-na-tists, in Eccl. Hist. was the name of a powerful and influential Christian sect that arose of a powerful and industrial Cursulan sees unas arose in North Africa in the early part of the 4th century. They were the followers of Donatus, a bishop of Nunnidia, who opposed the election of Cecilianus to the bishopric of Carthage in 311, on the ground of his being a traditor, or having delivered up the sacred books to the nagara and that thousand is alaction, we books to the pagans, and that thereby his election was void, and all who adhered to him heretics. He quitted vois, and an who adhered to him heretics. He quitted the Roman church, and founded a distinct sect, re-garded all others as heretics, and not to be received into their body without a second baptism; conse-quently they denied the infallibility of the Roman church. They were condemned in a council held as Roma two years of their assumptions and the Rome two years after their separation, and the year following by another at Arles. Constantine the Great, in 316, deprived them of their churches, and sent their seditious bishops into banishment; but, notwithstanding these severities, their doctrines spread very rapidly, and in 330 they are said to have numbered 172 bishops in the Christian provinces of Northern Africa. Driven in the Christian provinces of Northern Africa. Driven fanatical by the oppression of the civil power, they not only denied the right of the state to interfere in matters ecclesiastical, but bands of Donatist ascelies attacked the imperial troops, and for thirteen years continued to devastate Mauritania and Numidia. Martyrdom was eagerly sought by them, and they willingly gave themselves up to be executed. Neither the eloquence of Augustine nor the severities of the emperor. Honoxing that any marked effect upon the emperor Honorius had any marked effect upon this body, and they continued to flourish during the 5th and greater part of the 6th century. Towards the end of the 6th century, however, many of them were induced to return to the Catholic church, and in the following century they became extinct. The Donatists, like the Novatisns, went upon the principle that the essence of a true church, according to Epiesians v. 27, consisted in the purity and holiness of each of its members individually, and not merely in its Apostolico-Catholic foundation and teaching: hence they held. DONATT'S COMET, do-nat-fe, a brilliant comet dis-covered at Florence by an Italian astronomer, named was itself polluted by communion with them, and con-Donati, early in June, 1839, when it was supposed to sequently ceased to be a true Christian church. They

### Donative

therefore excommunicated all known and gross offenders, only receiving them again upon being re-bap-tized: and they also held that the efficacy of the sacraments depended upon the personal worthiness of

the administrator.

the administrator.

DONATIVE, don'-d-fiv (Lat. donatives), is generally a donation, gift, or gratuity. In the canon law it is applied to a benefice given by the patron to a priest without presentation to the ordinary, and without is attitution and induction. No license from the bishop is necessary to perfect the donee's title to the possession of the donative; it receives its full effect from the single act and sole authority of the donor. Donatives are further exempt from episcopal jurisdiction, and are wisited by commissioners appointed by the patron. Donatives are created whenever the king, or any subject by his license, doth found a church or chapel, and ordain that it shall be merely in the gift or disposal of ordain that it shall be merely in the gift or disposal of the patron, subject to his visitation only, and not to that of the ordinary, and vested absolutely in the clerk by the patron's deed of donation, without presentation, institution, or induction. According to some, this was anciently the only way of conferring ecolesiastical be-neffices in England, the institution by a bishop not being earlier than the time of Becket; according to others, the claim of the bishops to institution is as old as the first planting of Christianity in the island. The law now is, that if the true patron once waives his privileze now is, that if the true patron once waives his privilege of donation, and presents to the bishop, and the clerk is admitted and instituted, the advowson ceases ever

is admitted and instituted, the advowson ceases ever after to be donative.

Donis Conditionalists. (See Entail.)

Donion, or Dongeon, don'-jon (Fr. donjon), in Medimval Arch., the name given to the keep or principal part of a castle. (See Castle.) Prisoners were generally confined in the basement story of the donjon, and from this circumstance, the word, which is now written dungeon, has been taken to express any dark and dreary prison cell, but more particularly one which is partially or entirely below the surface of the ground.

and areary prison cell, out more particularly one which is partially or entirely below the surface of the ground. Dow Juan, don ju'-ān, a legendary or mythical character, prevalent in southern Europe, and intended as a representative cubodiment of sensuality and want of faith. It stands in contrast to Göthe's Faust, which represents rather a crafty and subtle rationalism tending towards the same ends. The rationalism tending towards the same ends. The legend of Don Juan represents the hero as a profligate man, who gives himself up entirely to his own selfish pleasures, especially to that of love. The legends are numerous, but bear a close resemblance to one another. The principal events are as follows. The scene is laid at Seville, and Don Juan is represented as belonging to a high and celebrated family. His chief object is the seduction of the daughter of a governor at Seville. Finding that the father opposes his designs, he stabs him in a duel. Afterwards, forcing his way into the family tomb of the murdered man, he orders a feast to be laid out, and sneeringly invites the marble statue which had been raised to his victim to join him at the banquet. The statue does appear, and, seizing Don banquet. The statue does appear, and, seizing Don Juan, both of them sink together into hell. This negend, which has been much used, was first employed in an operatic form by Vincenzo Righini, in "Il Con-vitato di Pietra." Mozart's "Don Juan" was written

witato di Pietra." Mozart's "Don Juan" was wruten eleven years afterwards, and since that time (1787) the legend has been a general favourite.

DONTH, REGIUM. (See REGIUM DONUM.)

DOOM BOOK, DOM BOC, Or DOME BOOK, doom'-buk, is the name given to the code of laws compiled by Alfred the Great. The general opinion has long been than the code of the laws but, according that Alfred was the framer of these laws; but, seconding to Dr. Pauli, in his life of that monarch, "he ing to Dr. Pauli, in his life of that monarch, "he created no new laws; his aim was simply to restore, to removate, to improve." In every part of his dominions he met with existing laws which required revision, alteration, or arrangement, and to this duty Alfred addressed himself, assisted by the advice and co-operation of the wisest and best men of the time. He had before him the Kentish collection of Rhelbert, the carvillation of the Wast Sayno laws by his own ancestor. compilation of the West Saxon laws by his own ancestor and the law-book of the great Offs, which was used derois. "Ina's collection was the only one rein Mercia. ceived entire into the Codex, which was chiefly applicable to the condition of the West Saxons. A few articles were admitted here and there from the Kentish

### DOORWAY

and Mercian laws; but research into this matter is not possible, as Offa's book is lost."—(Pauli.) Every-where throughout this code is the character of Alfred's own mind shown much more than that of the age in which he lived. It cannot be denied that there is a tendency towards despotism manifested in these laws, and also that they incline too much to the old Levitand also that they incline too much to the old Levitical law; but nevertheless it is evident that he strove to administer law and justice with equity, and to temper the old Jewish economy by the addition of the grand Christian doctrine, that "a man should love his neighbour as himself." He begins with extracts from the Bible:—"And the Lord spake all these words; saying, I am the Lord thy God," &c.; then follow the Ten Commandments, part of the Mosaic law, followed by passages from the New Testament, including the golden rule of Christian morality. He strove not only to represe grime but to check every species of impogomes rue of christian morality. He acrove not only to repress crime, but to check every species of immo-rality among all classes of his subjects; and his efforts to educate the morals of his powerful but still uncul-tivated people, in accordance with the doctrines of the Bible, are indeed beautiful and excellent.

Doomstar, or Deemstar, doomster, the name of an officer formerly attached to the High Court of Justiciary in Scotland. He pronounced the sentence or doom of condemned persons. The office has been abolished for many years. When a trial had conor doom of condemned persons. The office has been abolished for many years. When a trial had concluded, the doomster was brought forward face to face with the wretched criminal. In the "Heart of Midlothian" and "Old Mortality" this dread official is described with all Sir Walter Scott's graphic power. Deemsters, in the islands of Jersey and Man, are judges of a particular kind.

Doon, dore (Sax. dure, Tenton. deur), the movable panel by which the doorway or entrance to any building anartment descriptor are the face. The movable of the same and t

panel by which the doorway or entrance to any building, apartment, closet, or court, is closed. The most common kind of door consists of boards joined together and nailed to transverse slips of wood. Such doors as these are called "ledge-doors." They are hung on staples, and fastened by a latch: they are principally used for workshops, out-houses, offices, and walled gardens. The ordinary house-door is fastened to one side of the doorway by hinges (see HINGE), on which it swings. It is secured by a box-lock, fixed to the inner side, or by a mortise-lock, which is buried in the lockrail, and worked by handles projecting on either side. rail, and worked by handles projecting on either side. These doors are made of panels fixed in a solid frame-These doors are made of panels fixed in a solid framework, and finished by mouldings of different kinds, which surround the panel. The horizontal pieces of the frame are called "rails," and the vertical pieces "styles." Doors are technically described by the number of panels they contain and the kind of moulding with which they are finished. When they move on hinges, like the ordinary doors of apartments, they are termed "swing-doors" Large double doors used to separate any long room are called "falling-doors". termed "swing-doors" Large double doors used to separate any long room are called "folding-doors." A jib-door is a door in a wall, which cannot well be detected when closed. A rolling or sliding door is one which travels on rollers, or in a groove, parallel and close to the wall in which is the sperture that it is intended to close. A smaller door which closes an opening cut in the entrance-door of a court-yard or large building, is called a "wicket-door." A trap-door is a door cut in called a "wicket-door." A trap-door is a door out in the floor to give access to cellars, or open parts under the roof of a house. Doors of large public buildings are sometimes made of brass, and even of stone or marble.

DODMAY, dore'-way, an aperture in the wall of any building, or the partitions, to allow of ingress and egress to and from the building itself and the various spartments that are within it. In ordinary buildings a strong framework of wood, to which the door is hung, is fastened to bond-timbers inserted in the sides of the is tastened to bond-timbers inserted in the sides of the opening. The vertical pieces or sides of the framework are called the "jambs," and the transverse piece at the top "the lintel." A piece of wood called the "cill" is sometimes put transversely between the feet, or lower ends of the jambs, to give strength and stiffness to the framework. For entrance-doors the cill is generally of stone. The framework is finished round the adder that the contract of the edge that is nearest the wall of the room or passage by a moulding. Doorways vary according to the size and importance of the building or apartment to which they give access, but the dimensions of an ordinary door-

## Dorado

way are about 7 feet by 3 feet. The treatment of the doorway forms a striking characteristic feature in the various styles of architecture. In Egyptian and Assyrian architecture the doorways are surmounted with square lintels. The openings, particularly in the former, were wider at the bottom than at the top, and surrounded by a flat moulding enriched with sculpture. The lintel was generally very deep, and surmounted with a projecting cornico, and colossal figures were usually placed on either side of the opening. The door-ways in Grecian architecture were rectangular in form; they were surrounded by mouldings, and sometimes surmounted with a cornice supported on brackets. In early Roman architecture the form of the doorway was the same; but at a later period the semicircular arched heading was introduced, which subsequently became the characteristic feature of the Byzantine and Romanesque styles. In Arabian and Gothic architecture the head of the doorway assumed a pointed form, and in the latter the opening was surrounded by a great variety of bold and deep mouldings, and richly orna-mented. The decoration employed became more and more elaborate in the transition from the Norman style to the Perpendicular English, through the Early English and Decorated English periods, being, perhaps, most graceful and natural in the style last named. In the Perpendicular English style of architecture, the doorway, although it was still pointed, was surmounted by a square moulding or label, which is peculiar to buildings in this style and of the Tudor period, when the flat four-centred arched heading was introduced.

DORADO, do-ra'-do (Fr. dorade, Sp. dorado, gilt, from dorar, to gild), in Astron., a constellation in the southern hemisphere, otherwise known as the Swordish, and so named by the German astronomer Bayer. It lies in a direct line between the constellations Argo and Eridanus. Its largest star is of the third magnitude.

Dorcas Society, dor'-kds, a term applied to an association of ladies who unite together to obtain subscriptions in order to bestow clothing and other aids to families in distress and want. The name is also given to societies got up for the purpose of giving work to distressed needlewomen. The name owes its origin to a verse in the Acts of the Apostles. "And all the widows stood by him weeping, and showing the

conts and garments which Dorcas made, while she was

with them."—Acts ix. 39.

DORIC DIALECT, dor'-ik, was one of the four dialects of the ancient Greek language, being that spoken by the inhabitants of Doris. It was characterized by a certain roughness and harshness, and was much less polished than either the Ionic or Attic. Pindar, Theoccitus, and Bion wrote in this dialect.

Dorss, dor-is, a genus of naked marine mollusca, sometimes known as sea-lemons. The body is oval, the abdomen flat; the back flat in some, and elevated in others; the mouth a small proboscis, with two small proboscis, with two small proboscis. tentacula; the vent situated in the back, and surrounded by a circle of branched or plumed gills. As is obvious from the structure of the digestive organs, the species must exist on the softest food. They are plentiful on the coasts of Britain, where they may be found crawling on rocks, sea-weed, &c.

DORMANT, dor'-mint (Fr., sleeping), in Her., an animal is said to be dormant when it has its head resting upon its fore-paws, in contradistinction to couchant,

ing upon its fore-paws, in contradistinction to conchant, where the head of the animal is held erect.

DOBMART VITALITY. (See VITALITY.)

DOBMER, dor-mer, the name given to a window put in a small projection like a gable rising vertically from the roof of a house, and used to light attice or sleeping apartments in the roof, instead of a skylight, which is in the plane of the roof. There are sometimes three, and even four rows of dormer windows in the steep roofs of large public edifices built in France, Belgium, Holland, and Germany, between the com-mencement of the 15th and the close of the 17th century.

Domitory, dor-me-tor-s (Lat. dormirs, Fr. dormir, to sleep), a sleeping-chamber, but especially applied to large apartments in a moreastery or school calculated to hold agrent number of beds. To insure privacy and solitude, either side of the dormitory in religious houses was often divided into a number of small cells. Dort, Synod of

DORNOUSE, dor'mous firm Lat. dormio, I sleep, and mouse), a gen. of rodent quadrupeds, which is generally regarded as forming a connecting link between the Murida (rats, mice, &c.) and the Sciurida (squirrels, &c.). The chief characters by which the dormice are distinguished from the squirrels are derived from the structure of the skull, teeth, and intestine. The form of the skull resembles that of the mice, in being suddenly narrowed in the frontal region. There are four molar teeth on each side in each jaw; the upper jaw not possessing the anterior rudimentary fifth molar characteristic of the squirrels. The intestine is destitute of a cocoum,—an organ which is of very large size in all the other rodentia. The dormice have no check-pouches. The ears resemble those of mice. The body is about the size of that of the common mouse, but much plumper; the eyes large, black, and prominent; the tail between two and three inches in length, and more hairy at the top than elsewhere. With the exception of the throat, which is elsewhere. With the exception of the throat, which is white, the dormonse is of a tawny-red colour. They are found only in the temperate parts of the Old World, especially in Europe and Africa. In Asia they appear to be confined to the neighbourhood of the Caucasus. Only a single species, the common dormouse (Myozus aveldanarius), is found in Britain. It is extracted accelerated and decide the cardon of the caucast of the extremely gentle and easily tuned, and feeds on beech-mast, acorns, hazel-nuts, &c. "It takes its food hold-ing it in its hands, and sitting on its haunches like a squirrel (so do the rats), and often suspending itself by its hind feet, in which position it feeds as easily and its hind feet, in which position it feeds as easily and comfortably as in the most ordinary position. Towards the winter it becomes exceedingly fat, and, having laid up a store of food, retires to its little nest, and coiling itself up into a ball, with the tail over the head and back, becomes completely torpid. A mild day calls it into transient life; it then takes a fresh supply of food, and relaxes into its former slumber; and, finally awakening in the spring, by which time it has lost much of its fat, it enters upon its usual habits, and the enjoyment of the conjuval and natural affections. The much of its lat, it sheets upon its usual markets. The conjoyment of the conjugal and paternal affections. The young are generally born blind; but in a few days the eyes are opened, and in a short time they are enabled to seek their food independently of their parents' care. I have reason to believe, in some cases at least, the dormouse has a second brood early in the autumn, as 1 have received from one locality in the month of September an adult one about half grown, evidently of the spring brood, and three very young ones, not more than a fortnight or three weeks old."—(Bell's Brilish Quadrupeds.) There are two other beside the common dormouse; viz., the fat dormouse (Myozus Nitela). The former is a large species, as big as a rat, and with a tail like a squirrel. It is a native of France and the south of Europe. The garden dormouse is smaller than the fat dormouse, and, breeding in gardens, is very destructive to wall and other fruit. It is a native of the temperate parts of Enrope and Asia.

Dossar, dor'sail (Lat. dorsalis, from dorsum, the back), denotes something appertaining to the back, and in Anat. it forms part of the name of ligaments,

In Aust. Torms part of the name of agaments, arteries, &c., belonging to that region.

DORSTENIA, dor-ste'-ne-3 (in honour of Theodore Dorsten, a German botanist), in Bot., a gen. of plants belonging to the nat. ord. Moracea. The rhizomes and roots of several species have been supposed to be antidotes to the bites of venomous reptiles: those of D. con'rayerca and braziliensis have been employed in medicine for their stimulant, tonic, and disphoretic properties.

DORT, SYNOD OF, dort, a famous assembly convened in 1618 at Dort, or Dordrecht, on the Rhine, convoked by the authority of the States-general. Eminent divines from England, Scotland, Bremen, Hessia, Switzerland, the Palatinate, and the United Provinces, attended it to decide the controversy between the Arminians and the Calvinists. The Arminian party desired to begin the debate by a condemnation of the Calvinistic tenet of reprobation; but it was decreed that as they them. selves were accused of departure from the faith, before they could condemn others they must justify them-selves. To this order of procedure they would not yield submission. They were banished, and the synod condemned, in order, the Arminian tenets. The Ar-

Dory

minians, or, as they were sometimes called, the Remonstrant party, suffered civil prescription and cruel persecutions. Grotius was sentenced to perpetual impersonuous, and Oldenbarnevelt was executed. Fries-land, Groningen, Zealand, Guelderland, and Utrecht, would not accept all the decisions of the synod; and its authority was not fully recognized in Holland or England. (See Arminians and Calvinian.)

DOER, or JOHN DOER, dor'e, a native of the Mediterranean, Northern, and Atlantic seas. Torbay, on the western British coast, is a celebrated locality for this fish. Its name John Dory is probably derived form its French appellation, jaune (yellow) doree (gitt). It is naually about eighteen inches in length, though Pennant mentions one that weighed twelve pounds. The general surface of the body is smooth and destitute of scales, but spiny scales or bony shields guard the dorsal and ventral edges. The anterior portions of the dorsal and oval fins are spiny, and very listing the accurated from the simpless portions. It is distinctly separated from the spineless portions. It is an extremely voracious fish, preying on small fishes and their spawn, as well as on the various kinds of crustaces and marine insects. It has an oval black spot on each side, and on this account shares with the spot of each side, and this account states with the haddock the honourable repute of being the fish from whose mouth the tribute-money was taken by St. Peter, the impression of whose thumb and foreinger remained to record the event. Other species of the clory very similar to the European are found in the acas of other parts of the world. It is the type of the fam. Zeidæ. The scientific name of the British spefam. Zeidæ. The scies is Zeus Faber.

Dose, dose (Gr. dosis, from didomi, I give), is employed to denote a proper quantity of anything to be given or administered at one time, and is generally applied to medicines. As the quantity of any medicine proper to be administered to an individual must necessarily depend upon his age and strength, these have to be taken into account in determining in any case the proper dose. A certain quantity, known as a full dose, is usually fixed upon as being suitable for a male from is usually fixed upon as being suitable for a male from 25 to 40 years of age, diminishing proportionally for persons above or below that age. Thus, when the age is between 1 and 2 months, \( \frac{1}{2} \), to \( \frac{1}{2} \), of a full dose is aufficient; at 8 months, \( \frac{1}{2} \); 12 months, \( \frac{1}{2} \); 2 years, \( \frac{1}{2} \); 8 years, \( \frac{1}{2} \); 8 years, \( \frac{1}{2} \); 8 years, \( \frac{1}{2} \); 65 years, \( \frac{1}{2} \); 80 years, \( \frac{1}{2} \); 65 years, \( \frac{1}{2} \); 8 years and upwards, \( \frac{1}{2} \). Hesides age, there are frequently other eigenvalues to be taken into account: as the conwards, 3. Desacts age, there are required out-circumstances to be taken into account; as the con-stitution, habits, &c., of the individual; and usually abent one-fourth less should be given to an adult female than an adult male. Neither will the above rule apply to all medicines; for some naturally act more powerfully on children than adults, or vice versal.

more powerfully on children than adults, or vice versal.

Dor, dot (derivation doubtful), in Mus., a point placed after a note to increase its duration one half. Formerly the dot was called the point of perfection; because a note, when dotted, attained its greatest length, or, in other words, was perfected. Dotted motes are also termed notes of prolation.

Dorren Notes, dot'-ted, notes which are increased in length by the addition of dots placed after them. A dot placed after a note renders it half as long again. Thus, inasmuch as a semilorer is as long as two minims. A dot placed after a dotted semilorer is as long as two minims.

so is a dotted semibreve equal to three minims. A double dot placed after a note increases it to threefourths its original value: thus, a double-dotted semibreve would be equal to three minims and a half. Rests may also be increased by the addition of dots: thus, a dotted semibreve rest is as long as a semibreve and a minim rest. A double-dotted rest is lengthened in the same manuer as the sound of a double-dotted note. Double dots are rarely affixed to semibreves or minims. When dots are placed at the sides of double bars, they indicate that the portions on the dotted sides are to be repeated. They are sometimes attached to single bars for precisely the same purpose.

DOTTERE, dot-fur-el (Charadria moriellas), a species of plover inhabiting the northern parts of Europe and Asia. They delight in the high elevations. On the Helvelyn, in Cumberland, 3,055 feet above the level of the sea, they abound in vast numbers, as they do, likewise, on some of the highest mountains of Scotland. They are migratory, and appear in Britain on their northern migration, in spring, and on their 686 Doubt

southern migration, in the autumn. The length of the dotterel is about ten inches. Its plumage in summer is brown on the upper part; the cheeks, throat, and a band above the eyes, white; breast rusty red, with a white gorget on the upper part of it; a conspicuous black patch on the middle of the belly, and a few of the tail-feathers tipped with white. It is tolerably well known in the London market, and its flesh is much esteemed.

DOUAY BIBLE. (See BIBLE.)

DOUBLE BAR, dubt. (Sr. double and barre), in Mus., a term applied to two straight parallel lines drawn close togother perpendicularly through the staff, for the purpose of dividing the various strains of a movement.

DOUBLE BASS, CONTRA BASS, or VIOLING.—The deepest and most powerful-toned instrument employed in concerted music. It so enriches and austains the masses of harmony, as to be indispensable in the orchestra. It has three thick catgut strings, which orchestra. It has three thick catgut strings, which are tuned by fourths, and generally plays from the same book or part as the violoncello, though it is sometimes found necessary to write a distinct part for it. Notwithstanding that all music for the double bass, in common with that for the violoncello, is written in the bass clef, the real pitch of the former instrument is an

DOUBLE COUNTERFOLKT.—When, in two-part composition, the parts are so composed that the upper one may be inverted an octave lower, so as to become the under part, whilst the other retains its place unaltered, it is called a double counterpoint in the octave.

Double Decomposition, in Chem., the interchange of scids and bases which takes place when certain salts are mixed together. Thus, sulphate of potast, on being mixed with nitrate of barvta, is not only decomposed itself, but causes decomposition in the baryta giving rise to sulphate of baryta and nitrate of potash. Double decomposition is resorted to in innumerable instances for the formation of salts, both in the labora-

tory and the manufactory.

DOUBLE ENDING.—When, at the end of a strain, two or more dots, a double bar, and several notes are placed, with a figure 1 over the first and a figure 2 over the second part, it is thus called. It signifies that certain measures are to be repeated, and the part under figure 1 to be sung or played the first time, and that under figure 2 the second. Should the parts 1 and 2 be connected by a tie, both are to be repeated the second time.

DOUBLE FLAT, in Mus., a character compounded of two flats, signifying that the note before which it is placed is to be sung or played two semitones lower

than its natural pitch.

DOUBLE SHARP, a character in Mus., designated by a cross, thus X, used to raise any note an interval of two tones. Neither double flats nor double sharps are ever placed at the head of a staff indicating the signature, but are only occasionally introduced in the course of a composition; for which reason no general staff signature is given to keys requiring more than seven

DOUBLE-SHOTTING .- When ships engage at close quarters, the guns are sometimes loaded with two and

quarters, the guns are sometimes loaded with two and even three balls, when they are said to be double and treble-shotted. By increasing the weight of metal to be discharged from the gun, its destructive power is considerably augmented at any short range. DOUBLE STARS. (See STAR.)

DOUBLE STARS. (See STAR.)

DOUBLE-TONGUING, a peculiar mode of tonguing employed by flantists, which produces a more brilliant and spirited effect, combined with a greater facility of articulation, than the ordinary method. Double-tonguing is effected by the action of the tongue against the roof of the mouth; this action being caused by the roof of the mouth; this action being caused by articulating the word tootle very distinctly, and at the same time accommodating such articulation with the corresponding notes.

DOUBLING THE CUBE. (See DUPLICATION OF THE CUBE.)

DOUBLOON, dub-loom' (Fr. doublon), a Spanish and Portuguese coin, the double of a pistole.

Dount, dowt (Lat. dubito, I doubt), is that state of mind in which we hesitate as to two contradictory conclusions, having no preponderance of evidence in

favour of either. Philosophers distinguish two kinds of doubt,—provisional and definitive. Provisional doubt is a voluntary suspension of our judgment for a doubt is a voluntary suspension of our judgment of a time, in order to come to a more clear and sure con-clusion. Definitive doubt is scepticism. We doubt through blindness, or passion, or malice; through fancy, or from a wish to doubt; but we doubt also from prudence and from mistrust, from wisdom and from prudence and from mistrust, from wisdom and through penetration of mind. A preliminary doubt is the fundamental condition of philosophy. We begin, in order that we may not end with doubt. This was first established as a rule in philosophic inquiry by Descartes, who tells us that he began by doubting everything, discharging his mind of all preconceived ideas, and admitting none as clear and true until he had anticated them for pricorous commission. had subjected them to a rigorous examination.

blet"

DOUBLET, dub'-let (Ang. Nor.), a tightly-fitting coat or jacket, closely resem-bling the jerkin. Itreached a little below the waist-belt; and the sleeves, al-

though generally fastened

on to the body of the garment, were sometimes detached, and tied on at the shoulder. The name "dou-

dress are frequent in the old dramatists; thus Shir-ley, in his "Bird in a Cage" (A.D. 1633), says,— "Every morning does this fellow put himself upon the racke with putting on his apparel, and manfully endures his taylor when

is derived from the fact, that it was usually wadded, or doubled, for purposes of defence. allusions to this article of



DOUBLET.

he screws and wrests his body into the fashion of his doublet."—Ref. Fairholv's Costume in England. DOUCHB. (See HYDROPATHY.)

Dove, duo (Sar dana, Du. duif), a term some-times extended, as the name pigeon also is, to the whole family of Columbida. "No distinction between the terms dove and pigeon is sanctioned either by constant scientific or general popular use. Audubon attempts to make a distinction, giving the name pigeon to



RINGDOVE.

those species of which many nests are built close to gether on the same trees, and dove to those which are gener on the same rees, and dove to those when are solitary in their nidification; but this distinction is quite unsuitable to the European species and contrary to British usage. (See PIOEON.) DOVE, SYMBOL OF THE.—The Holy Ghost having

descended upon Christ at his baptism in the form of a dove, that bird is generally employed as a symbol of the Spirit in religious art. It is also used as an emblam of peace, when it bears an olive-branch in its mouth, doubtless referring to the return of the dove to the ark. When used as an emblem of purity by the ancient painters, it was usually represented white, ancient painters, it was usually represented white, with red claws and beak, and sometimes with a golden aimbur round the head. Dying saints and martyrs of the British Association, is the one which was used 687

are frequently represented with a dove flying from their mouths; in these cases it is a symbol of the soul purified by suffering. In some stained windows, the seven gifts of the Holy Spirit are symbolized by a dove, seven gins of the Hoy spirit are symbologically wavelength, which proceed seven rays, terminating in seven stars. When used as a symbol of the Church of Christ, the dove is represented with six wings,—two at the head, two at the shoulders, and two at the feet. The figure of a dove is often to be seen in English characters at the present day one the operator of forts.

churches at the present day over the covers of fonts.

Doverant, in Carpentry and Joining, the name given
to a peculiar method of connecting two pieces of timber together. The end of one piece is cut into one or more projections, resembling the fan-like form of a bird's tail, which are fitted into a hollow or hollows of eracity the same shape cut out of the end of another pieceto receive them. It is used for joining flat boards, and in scarfing beams together, as well as for joining timbers end to end or at right angles to each other, and the ends of the sides of boxes and drawers.

Downgen, dow-d-jer (Fr. douarriere), denotes, properly, a widow with a dower, but commonly the title is only applied to the widows of persons of high rank, and

only applied to the wholes of persons of high rank, and is used to distinguish them from the wives of their husbands' heirs, who have the same name and title.

Dower, dow'-er (Welsh, dawd), that portion of a husband's lands, tenements, &c., to which a wife is entitled for her life upon the death of her husband.

Dower, dow'-re (Lat. dos, a gits), though often confounded with dower, has quite a different meaning, being the marriage portion brought by a wife to her husband.

husband. Doxology, doks-ol'-o-je (Gr. doxa, glory, and logos, a discourse), denotes a form of praise, or giving glory to God; as in the concluding paragraph of the Lord Z Prayer,—"Thine is the kingdom, and the power, and the glory, for ever;" or the Hymn of the Angels (Luke ii. 14),—"Glory to God in the highest, and on earth peace, good will to all men." Two hymns used in the early Christian church were known as the greater and leaser doxology. The greater develops was simply and lesser doxology. The greater doxology was simply an expansion to the angelic hymn, and is now generally known by that name; it is sung in the Roman Catholic church at the celebration of the Lord's Supper and at matins. The lesser doxology is the ordinary doxology, "Glory be to the Father, and to the Son," &c., repeated at the end of each psain in the service of the Church of England.

DRACEMA, draits not from Gr. drakaina, a female dragou, the inspissated juice becoming a powder like dragou's blood), in Bot., a gen. of plants belonging to the ust. ord. Likacea. The most remarkable species is D. Draco, the dragon-tree of Teneriffe, which drains a drain of the most remarkable species is D. Draco, the dragon-tree of Teneriffe, which drains a drain of the dragon tree of the most remarkable species is D. Draco, the dragon-tree of the dragonwhich attains a great size, and, unlike the majority of monocotyledonous trees, has forked branches. This plant yields a red resin, resembling dragon's blood, but it is not known in commerce. D. terminalis, the tiplant, a native of the Sandwich Islands, has sturched.

panni, a native of the Sandwich Issaud, as suredy roots, which are baked and eaten by the islanders; it juice is used for making a fermented beverage, and its leaves are employed as fodder for cattle.

DRACHE, DRACHEMA, or DRAM, drüm (Gr. drachme), a silver coin of ancient Greece, used as the unit of the money system. Since the year 1833 the anti of the money system of modern Greece has also been called draches, and is early to the table. money system of modern Greece has also been called drachma, and is equal to about \$3d\$. Amongst the sucients the value of the drachma was nearly equal to a French franc, or \$3d\$ in English money. It differed according to the value of specie, but was always calculated as the 100th part of the mina, which was generally worth about £4 sterling. There were also coins valued at two, three, and four \_rachmas. As a weight the drachma was considered also equal to the 100th part of a mina, or about \$\frac{1}{2}\text{ or quite to the 100th part of a mina, or about \$\frac{1}{2}\text{ or quite to the 100th part of a mina, or about \$\frac{1}{2}\text{ or quite to the 273} grains troy, and the apothecaries', which is equivalent to \$273\$ grains troy and the apothecaries', which is equivalent to \$60\$ grains troy. Dacco, drai-ko (Gr. drakon, Lat draco, a dragon), a constellation in the northern hemisphere, between Ursa Minor, Cepheus, Cygnus, and Hercules. The largest star in this constellation is of the second magnitude. This star, known as 7 Draconis, and numbered

### Draft

by Bradley when he discovered the aberration of light, to determine the coefficient of aberration of the fixed

DRAFT, OF DRAUGHT, draft (from Sax. draffas, to draw), is an order from one person to another, directing the payment of money either to the drawer or to a third party. The term is also applied to the first or rough copy of a legal or formal document. When this draft is corrected and finally adjusted, it serves as the material for a fair copy. Proof-sheets and MSS, may be called the drafts of printed works. In Mil., the

be called the drafts of printed works. In Mil., the selecting and detaching of soldiers from a company, regiment, &c., to form other companies, or to proceed upon certain duties, is termed drafting.

DRAG, drdg (Ang.-Sax.), a mechanical arrangement, by which the speed of a vehicle can be decreased by stopping or slackening the rotation of one or more of stopping or alackening the rotation of one or more of the wheels. The original drag was a very primitive arrangement, and was generally called the shoe or skid; it consisted of a hollow piece of iron, not unlike a shoe in shape, which fitted the tire of one of the hind wheels. It was attached to the bottom of the carriage by a chain, and when applied was put under one of the hind wheels; by this means, acting as a sort of wedge, it prevented the wheel from going round, and thus retarded the velocity of the vehicle. The invention of the patent drag was a great improvement upon tion of the patent drag was a great improvement upon this clumsy mechanism. By means of the patent drag a sort of skid is pressed against one of the sides of a a sort or skid is pressed against one of the sides of a wheel, effecting all the stoppage required, with the advantage that the whole can be regulated by the driver, without stopping or getting down, by means of a handle connected with a series of rods and levers. In the case of the shoe-drag, the stoppage of the carriage every time it was put on or taken off was absolutely received. lutely necessary. The use of the drag is to keep the vehicle from pressing too hard upon the horses when going down hill at their ordinary puce. Powerful drags, which not in a similar manner to that described, are used for stopping or decreasing the speed of rail-

drags, which not in a similar manner to that described, are used for stopping, or decreasing the apeed of railway trains: they are called breaks.

Dragoman, drag-o-man (Turk: trukeman), the term applied, in Turkey, to all interpreters or foreign guides. The diplomatic dragomen, however, are very important personages, and serve as a means of communication between the officers of the Ottoman government and the ambassadors of other European nations. They are allowed several important privileges, not the least of which is, that they and their families are not considered to be under Turkish law, but under the jurisdiction of the country by whose embassy they are employed. As the laws of Turkey are very severe and summarily carried out, this privilege is much valued. The diplomatic dragomen are seldom pure natives, but mostly Italians, descended from Geneese or Venetian merchants. The occupation of the ordinary Turkish law, the dragoman is exactly similar to that of the French commissionnaire and the Italian cicerone. Dragomen of this description are provided at many of the hotels in Constantinople, and other cities throughout Turkey.

Dragon, drag-on (Gr. drakon, Fr. dragon), a term

DEAGON, drag'-on (Gr. drakon, Fr. dragon), a term



applied in modern Nat. Hist. to certain kinds of in fine summer weather huwking about over the surface saurian teptiles. Some of these (the genus Drace of of ponds and rivers in search of insect prey. Their

## Dragon-fiv

Linnæus) are furnished with a broad membranous lobe on each side. This is supported by the six first false ribs, which are extended straight outwards from the vertebral column. By the movement of these bones, the reptile is enabled to stretch its broad lateral memthe reptile is enabled to stretch its broad lateral mem-brane, which thus forms a sort of parachute, to sup-port it in its long leaps from branch to branch. They, however, are quite destitute of any power to strike the sir; so that their flight is nothing but a floating through space. As a rule, the species is harmless; there is, however, one, inhabiting the marshy plains of Guiann, and called the flying dragon, that bites severely if it should be handled. This creature has a long com-

should be handled. This creature has a long compressed tail, the back and tail created, and the tongue forked, like that of a serpent: it sometimes attains a length of six feet. "Both its flesh and eggs are eaten.

Dagon, in Myth. Hist.—In nearly every country, and at all times, there have been legends concerning the existence of a huge monster, which went about devouring and devastating all before it. This monster, which we have the concerning and devastating all before it. This monster, a concerning the supposed to be a suppo or dragon as it is generally called, is supposed to be or dragon as it is generally called, is supposed to be the symbolical representative of arrogant power and cruelty, whose sole object is to oppose order and pro-gress. Although it is probable, as Brand save, that "the dragon is one of those shapes which fear has created to itself," nevertheless, from the generality of the legends concerning this winged saurian, it is pos-sible that the existence of some species of the pterodactyl, in very remote times, may have originated the dastyl, in very remote times, may have originated the superstition. However this may have been, it is certain that this mythical animal, in all ages, has been looked upon as a minister of evil, the destruction of which was considered one of the grandest objects of human energy. The task was usually allotted to gods and herces. Apollo killed the Python, and Perseus slew the dragon, and saved Andromeda. Hercules, as the ideal of physical power, is also represented as a dragon-slayer. From poetry the legend of the dragon passed into art, and the Greeks and the Romans bore it as an emblem on their shields and helmets. In the Nib'tunega Lied, in later times, Slegfried is repre-Nibriumen Lied, in later times, Siegfried is represented as killing a dragon; and in the epic of Beowolf, the two contests of the hero, first with the monster Grendel, and afterwards with the dragon, form the principal incidents of the poem. Among the Scandinaviaus, Thor was described as a dragon-slayer. Among the Teutonic tribes the practice of bearing the dragon as an emblem on their shields and banuers was common, and they introduced the practice very carly into England. Among the Celts the dragon was con-sidered the emblem of sovereignty, and as such was borne on the helmet of the monarch. In the Middle Ages, in religious paintings, the dragon was looked upon as the representative of sin. Saints and martyrs are frequently depicted trampling a dragon under foot. It is also used with this signification in the figure of St. George and the Dragon. Sometimes it has been used as a symbol of heresy. A body of men in Hun-gary, who enrolled themselves in order to crush John Huss and his followers, called themselves Knights of the Order of the Dragon. The figure of the dragon is much used in heraldry; and when an animal, such as a lion or tiger, is represented with its own head but with a dragon's wings and tail, it is said to be dragonné. Fiery dragons were meteors of which there are many old records. The fear of the spectators bestowed the forms of dragons on the phenomena which they

DEAGONET (Callionymus), a fish of the Gobioida fam., inhabiting the Mediterranean and Northern seas. They are remarkable for having the gill-opening reduced to a small hole on each side of the nape, and the wentral fins placed under the threat, separate and larger than the pectorals. The eyes are placed on the top of the head, looking upwards; the skin smooth and scaleless. The colours of the fish are yellow, blue, scaless. The colours of the fish are yellow, blue, and white, making a beautiful appearance. There are three or four species; but that known with us as the genmeous dragonet (Callionymus), and, by the Scotch, gowdie, is by far the most beautiful. All the species are about twelve inches long.

Dragon-fly (Libellula), a Linawan gen. of near-pterous insects, common in England, and to be seen in fine summer weather hawking about over the surface

vulgar English name is "horse-stinger," which is no less inappropriate than ugly, as the insect possesses no means of analying either horses or any other of the larger animals. They rival the butterflies in their lives and like the larger hand. means of annoying either horses or any other of the larger animals. They rival the butterflies in their hues, and, like them, love to bask in the sunshine. They are, however, not nearly so harmless in their mode of living, sud, instead of the nectar of flowers, prey on insects. They have strong horny mandibles and maxille, covered by the labrum and labium; their tarsi are three-pointed; their wings are equal; the posterior extremity of the abdomen is furnished with hooks or peculiar appendages. Their ferocity is so ungovernable, that when taken and imprisoned, they have been known to devour their own bodies. The have been known to devour their own bodies. great dragon-fly (Alshna grandis) is about four inches long, and the largest of the British species. It has been seen to dart upon a large cabbage butterfly, and to bite off the wings and devour the entire body in less than a minute. In the larva state, the Libellulide than a minute. In the larva state, the Libellulides live entirely in the water, engaged in unceasing strife with other insects, for whose capture and destruction it possesses ample means, through a singular contri-vance of its lower lip. This consists of two principal pieces, one of which is articulated to the head, whilst the second is attached to its extremity. At the spex of this second piece, two jaw-like organs are articulated. In repose this lip is folded beneath the head, but can be immediately extended to a considerable distance in front of the head, so as to seize any minute insects or small fishes that may pass before it. The respiration of the large of some of these insects is singularly contrived. They are provided with the means of drawing water into their bodies to supply air for respiration, and expél it again by the same oriflee at the extremity of the abdomen, with such force, that they thus propel themselves through the water, whilst their large terms of the The hostest the extremities. they thus proper themselves through the water, whilst their legs are at rest. The hooks at the extremity of the abdomen of the dragon-fly render the creature essential service at the period of transformation. Crawling out of the water, it attaches itself by these hooks to a stick or rush, and struggles out of the pupa-At first its body is quite soft and moist, and the wings folded up into a small compass. In a few hours, however, the wings are capable of expansion, and the body assumes a proper consistency. Dragon-flies abound most in warm climates, but are met with in very northern regions.

DRAGON-TREE. (See DRACENA.)

DRAGON'S BLOOD. (See CALAMUS, PTRROCARAUS.) DRAGOON, drug-oon' (Fr. dragon, from Lat. draco, DRAGOON, drag-oon' (Fr. dragon, from Lat. draco, a serpent with wings and claws, supposed to be able to emit flames from the mouth), a mounted soldier, so called from the weapon with which the horsemen raised about 1600, by the Mareschal de Brissac, were armed; be-cause the muzzle was shaped like the extended jaws of a dragon. It is the common term for a cavalry soldier in the British service. (See CAVALEY.)

DRAIN, drain (Sax. drehnigean), the name applied

to any channel constructed underground for the pur pose of carrying off surplus water and refuse mat-ter from houses, fields, &c. When drains are open and are merely channels out along the surface of the ground, or by the sides of streets and roads, they are called ditches and gutters; when they are of great size, for the purpose of carrying off the refuse of a town, they are called sewers. Drains that lie underground may be formed of pipes of clay or carthenware, or of low walls of brick or stone, raised on a bottom formed of broad flat stones, and covered in with the same. These are, however, more liable to become choked by the roots of trees and shrubs growing into them than those which are formed of pipes. Circular drains of brickwork are called barrel drains.

DEAINING, or DRAFNAGE, the art by which surplus water may be carried off from swampy districts and stiff clay soil, as well as other land in which the excess stiff clay soil, as well as outer than an unity of water is prejudicial to vegetation. It may be applied to low districts containing thousands of acres, or to sincle fields of comparatively small extent. In the

be cut in the direction of the slope of the field, which is the direction in which it is pleughed from top to bottom. The trenches for drains are out with spades of different widths, the upper part of the trench being taken out with the widest, and a very narrow one, and the terminal termin called a bottoming-tool, being used to form the bottom of the trench, so that the vertical section of a trench cut for the formation of a drain exactly resembles that cut for the formation of a drain exactly resembles that of a flower-pot. The bottom of each trench was at first filled with rough stones only, about 2 or 3 inches in diameter, and a thick layer of soil was thrown over them; but subsequently, drain-tiles and pipes were used without the addition of any stones above them, as the drains were found to be less liable to obstruction. tion when the whole of the trench above the pipes was filled in with earth. The tile-and-shoe drain was introduced when the practice of filling the trench with atones was first abandoned: this consisted of a flut tile, or shoe, which was laid at the bottom of the trench, and on which another tile, arched in form, was placed, which was of the same length as the shoe was placen, when was of the same length as the shoe on which it stood. But these have been superseded by the cylindrical drain-pipes, which are made in all sizes, from 12 to 24 inches in length and from 1 to 6 inches in diameter. Pipes about 2 inches in diameter are commonly used for small drains, and the larger sizes, from 4 to 6 inches in diameter, for sub-main drains. In loose or peaty soils the pipes should be connected by collars, but this is not required in ordi-nary soils. The depth and width of the trench at the nary soils. The depth and width of the trench at the bottom of which the drain is to be placed must also be regulated, in a great measure, by the nature of the soil; but it should in no case be less than 2 feet or more than 6 feet below the surface. When the drains are than 6 feet below the surface. When the drains are about 3 feet deep, and less than this, they should be placed about 25 or 30 feet apart; but when they are deeper than 3 feet, they should be placed apart, at distances varying from 50 to 70 feet. It has been calculated that the cost of drainage per acre varies from £2. 10s. to £5. The cost of pipes per thousand is as follows:—1 inch in diameter, \$s. 6d.; 1\frac{1}{2}, 6s.; 1\frac{1}{4}, 6s.; 1\fr is obtained, which readily absorbs moisture in time of drought; heavier crops are obtained, which ripen earlier, as the seed can be sown sooner on drained than on undrained soil; mosses, rushes, and coarse sour grass are entirely removed in course of time, and the air is no longer tainted with the exhalations that rise from marshy land; the soil also can be worked sooner after a heavy fall of rain than it could have been when it was in an undrained state. The drainage of exten-sive districts comes within the province of the civil sive districts comes within the province of the civil engineer. Among the principal tracts of country that have been reclaimed and made available for pasturage and tillage by draining, may be mentioned, the Bog of Allen, in Ireland; Chat Moss, in Lancashire; and the Pontine marshes, near Rome. Immense works of this nature have been carried out in Holland, and in the fen districts of Cambridgeshire and Lincolnshire, near the Wash, which are drained by what is called the the Wash, which are drained by what is called the "Bedford Level," under the control of the Bedford Level corporation. In the cases that have just been mentioned, the surface of the land reclaimed lies below the level of the sea, and the water that is continually collecting from rain and other causes is discharged through self-acting floodgates, or has to be lifted, by wheels or Archimedean screws, over the embankments that have been constructed to prevent the encrocliments of the water. These wheels and pumps are worked by steam power, and, in Holland, sometimes by means of windmills. Constant care and watchfulness is required to see that the embankments, sluices, floodgates, &., are always in perfect order and repair. On May 4th, 1862, the Middle Level sluice, through which the waters of the Middle Level drain are discharged, that waters of the Middle Level drain are discharged, that runs through the fens for eleven miles, suddenly blew up, as it is called, having been undermined by the waters of the German Ocean. The since had evinced unmistakable signs of decay for a considerable period. When it first burst, about 10,000 acres of fertile ground, rich and smiling with the accumulated industry of years, were submerged in a few hours, and the sluice, that had been erected at a cost of 240,000, was reneared activation was a power of the submerged of the submerged to the submerged of the su to low districts containing thousands of acres, or to up, as it is called, naving been undermitted to the single fields of comparatively small extent. In the waters of the German Ocean. The sluice had evinced latter case it is chiefly applied to render stiff and tenacious clay soils friable, fertile, and uroductive; and, indeed, it is now found that no land of this description can possibly be brought into proper cultivation years, were submerged in a few hours, and the sluice, without having recourse to this system for its ambiout that had been erected at a cost of £40,000, was rentation. It is considered better that all drains should on, destroying crops and cattle, and damaging homesteads and farm-buildings, until thousands of acres, in addition to what had been covered by the first rush of the sea through the broken sluice, were hidden under water. The efforts of the most skilful engineers were powerless for many weeks to put a stop to the work of destruction that was going on in the Marshland fens; and it was not until the end of the following month that the ingress of the waters was checked. This disaster was followed by the destruction of the Marshland Smeeth sluice, a drain entering the Ouse about 300 yards to the north of the Middle Level sluice, on the evening of Oct. 4th. This happened in consequence of the extra pressure on the embankment and works, owing to the discharge of a quantity of water from the land that had been submerged in May, through this and an adjoining drain, called the Marshland sower. The rush of water had undermined and scoursed away the earth behind the flank walls of the sluice, although every precaution had been taken to strengthen the embankment on either side. In consequence of the destruction of the sluice, which gave signs of breaking up only ten minutes before the catastrophe happened, a great part of the country which had been reclaimed and brought into cultivation since the bursting of the Middle Level banks in May, was again flooded, and the struggle to force back the encreaching waters of the North Sea had to be commenced anew.

Drain-trap.—When a drain has been constructed, it is desirable to prevent the escape of any mephitic gas from the drain itself, generated by the decomposition of its contents, as well as the entrance of sand and any solid matter into the water-course, which would form an accumulation and choke the drain. To obviate this a small square pit is made at the head of the drain, the bettom of which is below the level of the mouth of the pipe. The pit is covered by a graing or perforated plate, to the centre of which an iron cup is attached, which fits over the top of the pipe, and has its lip below the surface of the water in the pit. The water between the mouth of the pipe and the surrounding wall of the cup acts as a barrier to prevent the escape of any foul air from the pipe. This is the common bell-trap, which is liable to get out of order in consequence of the ease with which he loose grating and cup may be removed. The most efficient drain-trap that can be used, which has received the approbation of architects, builders, and medical men, is the new patent sink-trap, invented by Messrs. Tye & Andrew, Brixton Road, Londou. It effectually prevents the escape of all noxious vapour, and when the trap is once fixed, the grating cannot be removed, which prevents the entrance of any solid substance into the drain. Besides the fixed grating, other points of importance which render the trap infinitely superior to all others, are the column of water which it opposes to the escape of any vapour that may be generated in the drain; and the serve boss, which allows a forcing-pump to be attached to the trap, which will remove any other communicating with it from a stable or elsewhere, and thus obviate the unpleasant alternative of opening the drain, to the detriment of the pavement, turf, beds, or garden walks under which it passes, whenever a stoppage may occur.

Drama, drai-ma (from the Gr. drama, action), a poem or piece composed for the stage; a composition in dialogue, in which the action is recited and represented, and not related. The love of imitation is inherent in human nature; and the first evidence of intellect given by a child is his assumption of the manner and bearing of some other person. As with individuals, so with nations; and almost every socient and modern civilized people have cultivated dramatic representation in some form. The Hindoos and the Chinese have a rich store of theatrical works; and in China the love of dramatic exhibition is a perfect rage. According to Aristotle, the Attic drama arose from the recitations of the leaders of the Dilbyrambus. The origin of the Greeian drama is said to have been the origies of shepherds and pessants in their solemnization of the rices of Bacchus, when the secrifice of a goat was followed by dances and a sort of masquerade, in which they personsted fauns and satyrs. In place of

masks, they stained their faces with the less of wine; and to the music which formed the principal part of this wild festivity, was added the recitation of an indi-vidual performer, who entertained the audience by his own single and unsided exertions. Thespis was the first to shape a regular entertainment out of these rude first to shape a regular entertainment out of these rude materials, in which effort he is said to have been assisted by one Susarion. The actors were separated from the audieuce, and placed upon a cart, or elevated platform made of boards laid upon trestles. The date of this first improvement was about 440 or 450 years before the Christian era. Eschylus was the first who converted monologue and soliloquy into action and dislower. He introduced upon the boards more and dialogue. He introduced upon the boards more than one actor at the same time, and relieved the declamation of the Thespian orator by the musical performance of a chorus: he also introduced scenery. A theatre, first of wood, afterwards of stone, accommodated a number of regular and attentive specta-tors; and the principal actors dressed in personal tors; and the principal actors dressed in personal diagniess suitable to the characters personated. They also were masks painted to represent the personal whom they performed. The mouths of these masks were shaped like the end of a trumpet, which, though it aided the actor's voice in filling the enormous area of the theatre, must have had a ludicrous appearance. The cothurnus, or buskin, added to the contract is highly the geograph distance between the actor's height; the enormous distance between the eyes of the auditors and the actors considerably lessening the apparent absurdities of the mask and buskin. Great trouble and expense were bestowed upon costume. When a Grecian actor personated a hero or a god, he concealed his face, increased his height, and wore a dress and mask exactly resembling the popular idea of the personage to be portrayed. The theatres were of enormous size, and built in the shape of a horse-shoe. The audience were placed on seats ele-vated one above another in gradation. The stage, which was on a level with the lowest row of seats, was placed at the flat end of the building. The space in the centre of the theatre, called in the present day the pit, was called the orchestra, and was occasionally occupied by the chorus. Æschylus having regulated Sophocles, Euripides, and other dramatiets, improved Sophoeles, Euripiaces, and other carmatices, improved an amusement to which the art-loving Greeks became passionately attached. During the performance of a play written by Hegemon, news was brought of the total defeat of the Grecian army before Syracuse. Among the auditors were relations of those who had fallen, and hardly one spectator had not, in addition to a patriotic grief, to mourn the loss of a friend or relative. They did not quit the theatre, but, spreading their mantles before their faces, ordered the representation to proceed, and, thus veiled, remained till its conclusior. The admission to these ancient theatres was at first one drackma; but Pericles caused the price to be lowered to two oboli. In their personations, the Grecian actors aimed at gravity of movement and declamatory grace, rather than the rapidity and vivacity of passion. They held a high rank in the republic, and popularity carried with it a rich recompense. The old Grecian comedy will be best described as the exact opposite and antithesis to their tragedy; for as in tragedy, doities, Titans, and departed heroes declaimed in sublime sentences, so, in comedy, the whole plan of a piece often turned upon these same sublime per-sonages, who were brought upon the stage for the mere purpose of ridicule. In fact, the Grecian comedy was a burlesque in the most modern sense of the word, in which Bacchus was represented as a coward, and Her-cules as a glutton. Aristophanes, the author of this kind of entertainment best known to us, was not the originator of the Grecian comedy: he had many predecessors, Magnes, Cratinus, Crates, Eupolis, and others. After ridiculing the Olympian deities, a species of mythological irreverence which the Athenians heartily enjoyed, he made the stage a vehicle for attack on public men, and, among others, Socrates and Cleon, a demagogue of great influence. Decrees were passed to protect the citizens against scurrilous dramatic libels, and finally comedy was prescribed. An actor named Anaxander was punished capitally for parodying a line of Euripides so as to convert it into an attack upon the government. He was starved to death,—a fate that has since, not uncommonly, fallen to

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the lot of both actors and dramatists. Aristophanes, who found that personality and invective were no longer tolerated, barbad the arrow of his wit at the accidents and absurdities of domestic life, in which walk of satire he was successfully followed by Menander and others. This new mine of satire was called by the aucients the New Comedy; and it was about this time that dramatic representations began to be divided by intervals of cessation, or acts, the use of the chorus being discontinued with the old comedy. If the dramas of Plautus and Terence do not present any great variety of character, it must be remembered that in works professing to be a picture of actual manners, comic writers could not, in a country where women led a life of seclusion, write for representation any female characters but those of mothers, maid-servants, and courtesans: thus the plot of a piece often turned upon the passion of a lover for a young woman, who was not brought upon the stage once during the play. Despite these disadvantages, the new comedy of the Greeks often conveyed a knowledge of deep truths and subtle feeling. In closing these brief remarks upon the Greek stage, it must be mentioned that the apostle Paul has

quoted from the Grecian drama.

The Romans had a sort of rude histrionic representation of their own. Their oldest spoken plays were ation of their own. Their oldest spoken plays were borrowed from the Osei, the indigenous inhabitants of Italy, and were called Fabula Ataliana. The performance consisted of satirical couplets, which were declaimed during the intervals of the games, and characters of fabulous antiquity were usually person-According to Livy, 361 years before the birth of Christ, during the rage of a great pestilence, in order to propitiate the deities, the Romans introduced a regular dramatic entertainment. Their plays, how-ever, notwithstanding the assumption of the mask and buskin as a regular profession, were rude in structure, until Livius Andronicus, who was by birth a Grecian, led the way to improvement by transplanting his native stage to Rome. The works of the Roman tragic authors, with the exception of those of Seneca, have not reached our time, though, singularly enough, we are compelled to judge of the new school of Greek comedy through the medium of Latin translations; indeed the Romans had two species of comedy,-the Palliata, in which the scene and dress were Grecian, and the Togata, in which they were Roman. It is presumed that as Roseius Gallus is mentioned by Cicero as wearing a mask upon the stage, in order to concesi an obliquity of vision, that other actors of his day played with their faces uncovered. The Romans, to quote the words of St. Augustine, "accounted the art of stage-playing infamous, and ordained that stageplayers should not only want the honour of other citizens, but also be disfranchised and thrust out of their tribe." This feeling was doubtless engendered by the fact of the Romans confounding the dramatic art with the games of the circus and amplitheatre, in which gladiators and slaves performed. Notwithstanding a denunciatory edict of the prætor, many actors rose to great wealth and high esteem in Rome. Roseius was the friend of Piso, Sylla, and Cicero; and Paris, who was afterwards put to death by Domition out of jealousy, exercised an arbitrary authority over dra-matic authors. Critics formed a code of laws for the guidance and regulation of the poet, of which Aristotle and Horace expressed their approval. The ancient and Horace expressed their approval. The ancient dramatic art expired with pagan Rome, and in its first age Christianity was inimical to the theatre. Any person connected with the dramatic art was not allowed baptism. The connection of the ancient theatre with heathen superstition, and the profligacy of some of the entertainments exhibited, offended the primitive church. With the extinction of literature and art, every trace of dramatic composition or preforments. every trace of dramatic composition or performance was for many conturies lost. The modern drama, like was for many conturies lost. The modern drama, like the ancient, had its foundation in religion, with this difference, that in place of the worship of Bacchus, difference, that in place of the worship of Bacenus, miracle-plays and mysteries were produced. The first speaking sacred drama is said to have been "Della Passione di nostro Signor Giesu Christi," by Giuliano Dati, bishop of San Leo, in 1455; and it was in Italy, the country in which the tragic art expired, that it revived in a different and purer form; but considerable uncertainty exists on this point; for the French claim

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the performance of a pastoral entitled "Un Jen" as early as the 13th century. The Chester Mysteries, the earliest plays acted publicly in England, were performed from 1268 to 1276. The meaning attached to the word "inystery" may be gleaned from the quotation of two of the verses of the prodamation or prologue to the famous Chester Mysteries or Whitaun Plays. The "moonke" mentioned is one Done Rondail, of Chester abbey, the deviser of the Mysteries:

This moonke, moonke-like in Scriptures well seene, In storyes travelled with the best sorte; In pagentes set fourin, apparently to all eyne, The Olde and Newe Testament with livelye comforte; Intermynglinge therewith, onely to make sporte, Some things not warranted by any writt, Which, to glad the hearers, he woulde men to take with

Now, you worshippfull Tanners, that of custome olde

The fall of Lucifer did set out,

Some writers awarrante your matter; therefore be boulde,

Lustily to playe the same to all the rowtte; And yf any thereof stande in any doubte, Your author his author hath, your shewe let bee, Good speech, fyne players, with apparill comelye.

Rude parodies of sacred history being inconsistent with the purity of the Christian religion, the Mysteries were succeeded by the Moralities, a sort of performance that bore considerable resemblance to the Old Comedy of the ancients, as they were founded upon allegorical subjects, almost always bore allusion to the events of the day, and abounded with strong and biting satire. Upon the revival of letters, Latin plays were composed by the learned in avowed imitation of the productions of anoient Greece and Rome; but the general public, to whom the classic drama was as a scaled book, showed a strong partiality to a new sort of representation, a union, or, rather, compound, of tragedy and comedy, which was called History or Historical drama. These generally told the exploits of a king from his manhood to his death, with such points of history as were the most marked and striking of his reign. These dramatic chronicles were so popular in England that hardly a single subject upon which Shakepere wrote had not been appropriated by his predecessors; the majority of his historical plays were therefore altered by his in the propulse.

majority of his historical plays were therefore altered by him from the plan of old dramatic chronicles.

The Romatic drama, which followed the historical, was founded upon legends, poems, and popular fictitions narratives. In Spain, the land of chivalry and romance, Lopez de Vega and Calderon, disregarding or despising the restrictions of the classic drama, inaugurated a new school. Their heroes, the exact reverse of the passionate sensual demigods of the ancient drama, were virtuous, self-sacrificing, brave, true, and loyal. Action and bustle took the plane of tedious elaboration of sentiment and thought; the passion of love was sublimated into a high, generous, and romantic feeling; and the introduction of a clown, who made extemporaneous jests both to actors and to audience, gave great pleasure to spectators, who were unwilling that the actors should entirely ignore their presence, and liked a chorus, though comprehended in one person, to explain and criti-isse the action of a play during its progress. In England the romantic drama was welcomed with ardour. In Italy the taste for the ancient and classical school of drama was so rooted that romantic dramas, histories, and tragi-comedies, could not long hold a place, but were succeeded by tragedies written upon the classic models.

The Halian comedy produced characters that never varied, some of whom are supposed to have descended directly from the Mimi of the Fubula Atellana. This ancient origin is claimed for Harlequin and Panchinello, an English Punch, both of whom are buffoons, cowards, wags, and josters, like the Sannio of the Romans. Pantalone was a Venetian merchant; Dottore, a Relognese physician; Spaviente, a Neapolitan oraggadocic; Pullivenella, a wag of Apula; Giangurgolo and Coviello, two clowns of Calabria; Gelsomina, a Roman beau; Beltrame, a Milanese simpleton;

Brighella, a Ferrarese pimp; and As levchino, a blun-dering servant of Bergano. Thus each personage, clad in a peculiar dress, and furnished with a peculiar mask, was intended as a characteristic representative mask, was intended as a characteristic representative of some particular Italian district or town. To further this local personation, each actor spoke the dislect of the place he represented. Besides these, and a few other such personages, of which, at least, four were introduced into each play, there were the amorosco or innameratas,—that is, men and women who played serious parts; and also Sneraldina, Colombias, Spilletta, and other females, who acted the servettas and waiting-maids. These last wore no masks, and all spoke Tuscan or Roman. The pieces played by them were called Commedia dell' Arie. Goldoni adopted Harlequin and the rest of his mimic troop; but, instead of trusting to the extempore wit of the actors, wrote for them plots and dislogues.

France has boasted that when the classic drama was

France has boasted that when the classic drama was basished from every other stage in Europe, it found a home in Paris; and yet her drama, like those of other nations, was, during the 16th and a great part of the 17th century, horrowed from Spain. As the English owe the excellence of their stage to Shakespere, so France is equally indebted to Corneille. Cardinal Richelieu placed himself at the head of five dramatic authors, all of whom are forgotten, with the exception authors, all of whom are torgotten, win the exception of Corneille. It was at this period that the classical fetters of the three unities were imposed upon French dramatic poets. "The unities of action, time, and place must be observed." Corneille adds, "Personne n'en doute." The French are not only proud of their pretensions to classicality and their regard for the unities, but are enabled to boast with justice that they have discarded tragi-comedy,—that is, such pieces as comprehend two distinct plots,—one of a serious, the other of a humorous sort, each totally unconnected with the other. Corneille and Racine were, according to Sir Walter Scott, the Homer and the Virgil of the French drama. Even Voltaire himself was content to imitate these two great models, although he endea-voured to make a Turk talk like a Turk, and a savage like a savage, instead of in the brilliant metaphor and stitled sentiment of the buskined heroes of his predecessors. Molière, the founder of French comedy, followed the path marked out by Menander, and has closely expired some pieces from the Latin stage. Few satirists have attacked vice and folly so successfully; satirists have attacked vice and folly so successfully; and it should be remembered, when considering his marvellous power, that, while the English stage was fostered by a people, the French stage was merely the appanage of a court. Thus the sphere of the satirist was limited to the palace and its immediate surroundings. Schlegel observes,—"The object of French comedy is not life, but society,—that perpetual negotiation between-conflicting vanities, which never ends in a sincere treaty of nearest the embroidered dress. tistion between conflicting vanities, which never ends in a sincere treaty of peace; the embroidered dress, the hat under the arm, and the sword by the side, essentially belong to them; and the whole of the characterization is limited to the folly of the men and the coquetry of the women." This comedy of maners rather than of nature was overturned by the "Figaro" of Beaumarchais,—a production in which incident, intrigue, characters in high and low life, lively dialogue, and political satire, were so craftly intermingled, the whole being flavoured with a strong tone of hierationness, that it was received by the

tone of licentiousness, that it was received by the Parisian public with an almost frantic enthusiasm, The English drams was founded upon the Spatish model. "Forrex and Porrex," the first regular English targedy, was acted hefore Queen Elizabeth upon the 18th of January, 1861, by the gentlemen of the Inner Temple. A version of the same piece was acted in one of the minor London theatres in 1854, but without success. "Gammer Gurton's Needle," which without success. "Gammer Gurton's Needle," which was said to be the work of John Still, master of arts, and afterwards bishop of Bath and Wells, was first performed in Christ's College, Cambridge, in 1675. The jest of the piece turns on the loss and recovery of the needle with which Cammer Gurton repaired the breeches of her man Hodge. The popular characters are, the Stardy Beggar, the Country Vicar, the Clown, and the Strew. Thus we see that, at the very commencement, English comedy was founded on scharacters of middle and humble life,

and, unlike the Freuch, was not dependent upon the frivolities and fashions of lords, ladies, and courtiers. It is to be remarked, that as our first tragedy had no intermixture of tragedy. The influence of the plays of Shakapere upon poetry, the drama, and the world at large, is too universally recognized to need comment in a work of this description, even if the space prescribed to us were unlimited. It is enough to say that his transcendant genius and matchless power created a model, which never has, and perhaps never will be equalled. His historical plays throw a light upon his country's history; his tragedies are schnowledged masterpieces by the highest critics of every civilized nation; and his romantic dramas and counciles, though not faultless, abound with the errors of a genius innation; and his romand crames and considerate, though not faultiess, abound with the errors of a genus incapable of self-control, and too powerful to submit to the trammels imposed upon the dramatist by the pedantry of inferior minds. The tragedies of Jonson pedantry of interior minds. The tragence of Johan are distinguished for a sublime expression of moral sentiment. In comedy he occasionally followed the older Grecian school, as in the "Tale of a Tub," where, older Grecian school, sein the "Tale ot sea up, where, in order to ridicule his enemy, Inigo Jones, be trod in the path of Aristophanes. In the "Steple of News" and "Cynthia's Revels" he introduced allegorical characters, and personified abstract passions. In tracing the history of the English drams, we perceive the im-mense influence over his successors, of the plays of Shakapere. Massinger, a man of considerable general, endeavoured to unite the romance of Shakapere to the realistic humour of Jonson; and though he has to the realistic humour of Jonson; and though ne has to an extent succeeded, his love passages are infinitely less interesting and his villanies more revolting than are those of his two models. Beaumont and Fletcher, both men of remarkable talents, grafted upon Shak-spere's method of composition the boundless licenso of the Spanish school. Sometimes almost discarding probability, violating character, and therefore weakening, if not destroying, the interest of the plot, they compensate for these faults and irregularities by admirable for these lands and fregularities by admirable descriptive passages, elegant wit, passionate and tender dialogue, and rich humour. The plays of Shirley, of Ford, of Webster, and Decker, although now forgotten by the mere playgoer, and holding no place upon the boards of the theatre of the present day, abound with admirable passages and detached scenes of singular merit; and it is, doubtless, to the fact of the rude apology for scenery, and the eye of the spectator being entirely ungratified in the English playhouses of the 16th and 17th centuries, that we are indebted for that brillient band of distinguished poets known as the Elder Dramatists. Audiences crowded to the theatre, not to gaze on splendid scenery, but to listen to the literary production of the author and to the declamatory graces of the player. The great and ori-ginal school, founded by Shakspere and Jonson, and followed by Massinger, Besumont and Fletcher, and others, closed with the outbreak of the civil war in 1642. A proclamation shut up the theatres and dispersed the A procismation statt up the theatree and dispersed Lio players, almost all of whom took up arms for King Charles, in whose service many of them perished. One Robinson, an actor at the Blackfriers theatre, was killed by Harrison, the regicide, in cold blood, Har-sison declaiming the text from Scripture, "Cursed be he who doeth the Lord's work negligently." The woon uccamming the text from Scripture, "Cursed be be who doeth the Lord's work negligently." The most ancient English playhouses were, according to Malone, the Curtain, in Shoreditch, and the Theatre. In the time of Shakspere there were no less than nine theatres open,—three private houses, one in Blackfriare, the Cockpit or Phasnix, in Drury Lane, and one in Salisbury Court. The six public theatres were the Globe, the Swan, the Rose, and the Hope, on the Bank side; the Red Bull, and the Fortane. In the winter of 1648, the players at the Cockpit, while acting the "Bloody Brothers," were surprised by a party of soldiers in the middle of the play, and extrict to prison in their playhouse dresses. On Feb. 11, 1647, an act of parliament was passed that all stage-galleries, seats, and boxes should be pulled down, by warrant of two justices of the peace; that all actors of plays for the time to come, being convicted, should be publicly whipped; and all spectators of plays should, for each offence, pay five shillings. The Restoration may be said to have inducted the second period of the English drams. Charles II., who is his exile imbibed French

## Dramatis Persons

tastes, brought with him to England a relian for the heastles of the Franch stage. Director, Howard, and the authors of the day, forcered this taste, and herois plays were appleaded by holf the count and city. The heroig play, were appleaded by holf the count and city. The heroig play, were a ferred, and invested in the logues, drama, and processions. The heroes and heroines were all of one exactly virtuous pattern; about was entirely refined, and love of the most impossible purity. At the same lime, councy described felineation of character and contraction on plot, and endeavoured to chine only in dialogue. The atmosphere of alicentious court infested the stage; and authors strove by a succession of simari jesis and loose epigrams to amuse the wift of the town rather than to point a moral or wing a saticinal graph. The duke of Buckingham's famous saticinal graph. The duke of art, and tragedy and commend graphs of the famous hand graphs of art, and tragedy and commend graphs of the saticinal graphs of the stage is one that display of passionate tenderness winced in the Fernelc characters of Otway, and, despite some rant and fustian, of Lee. The 18th century asserted in genteel comedy, an entertainment that crashited the forbles of the higher classes; comedy of intrigue, in which plots and surprises succeed each of buckers, and English opera. (See Orexa.) To Garrick the stage is indebted for a revival of the plays of Shakapster; and to Sheridan for a description of comedy, that, to the polish and wit of the authors of the Congreve the Congress and Farquiar school, added humorous and distracteristic dialogue. George Colman the elder and George Colman the younger both contributed ad-mirable comedies to the rich repertory of the drama; mirable comedes to the non repertory of the drams, and Maturin, Lord Byron, Coleridge, and Joanus Baillie, were the authors of the tragedies produced in the early part of the present century. The two Kembies and Mira, Siddons, Edmund Kean, Charles Young, and Miss O'Neil, were of the same ers, one of the most brilliant of which the English stage can boast. The last attempt to maintain a high school of tragic art was made by Mr. Macready, at Drury Lane, in 1842. The events of the last fifty years are not matters of history, therefore we shall not dwell upon them. At present, English literature would seem to have aban-dened the drams, for our stage is almost entirely oc-cupied by translations from the French. The public have contracted a taste for the morbid, the spectral, and the horrible, united to illusions of the eye and mechanical contrivance. The causes for this decline are many; but it cannot be supposed that at a time are many; but it cannot be supposed that at a time when theafres are more successful speculations in a commercial point of view than ever, a taste so low can be long sustained. The actors deplore the exercise of the various arts that now prove so attractive; and there can be no doubt that, although many managers of theatres may realize large fortunes, the degradation of the art of acting will be the natural result of the unhealthy excitements that now pander to a depraced popular tests.—Ref. Art. Drama, by Sir Walter Scott, in Engyslopadia Britannica.

Dramatis Prasson. d'am'd-tis per-so'-ne (Lat.).

DRAMATIS PRESONE, dram'-ā-tis per-eo'-ne (Lat.), the various personages introduced in the course of a drama, or the actors representing the characters in

drams, or the actors representing the characters is of a greater quantity of goods than what would have brighter executed in plaster or marble is attended with influently, and requires considerable skill on the part of the artist and modeller. It must be allowed, that the costame of the present day is peculiarly mented for representation in the above materials; but, in many cases, additional effect is given to the figure, and its fittly disposed to suit the circumstances under which sterry is conveyed to us in a more striking manner, by the addition of a little drapery thrown around the nude forcit, the folds of which are carefully arranged and exitified granted, entitling the owner to receive the drawback. No drawback is given on damaged or decayed goods. Dawmarnen, draw-brig (Ang.-Sax.), a movable and skilfelly disposed to suit the circumstances under which the figure is represented. Thus, a short gare ment girt round the waist of a running figere, showing the content of the fore part of the thigh sad knee, and streaming out behind, gives additional force to be desired to the carp of the dich in front of the sort of the thigh sad knee, and streaming out behind, gives additional force to the same of part of the dich in front of the sort of the time and on the same of currantees.

## Drawbridge

ever drapery is used, it should be so contrived that it may give expression to the form of the figure, and aid is explaining the story that the sculpter wishes to convey to us in connection with his work. Many will remember the sconderful and exquisite manner in which the light drapery was treated that was thrown over the bead of the "Veiled Figure," by Month, that was arhibited in the Austrian court in the Great Brhibition of [ARI] tion of 1851.

DEASTICS, dels'-tiles (Gr. drostices, active, brisk, from drue, I affect), is a term generally applied to such medicines as are very violent in their action, particularly as purgatives; such as croton oil, jalap, &c.

DEAUGHT, draft (Ang. Sax.), a technical term used in Mar. to express the depth of water in which a chip can float; thus, if a vessel requires twelve feet of water to enable her to float, she is said to draw twelve feet, no order that her draught may be assily known; it is norder that her draught may be easily known, it is marked on the stem and stern-post.

DRAUGHT (Lat. kaustus) is a liquid form of medicine

intended to be taken at once, or at a draught; whence

DRAUGHTS, a game played by two persons on a board similar to that used in playing chess. Each player has a set of twelve pieces, which cousist of small round flat disks, made of wood or ivory; one set is black and the other white. The pieces must all be placed on the same colour, in alternate fours in the first three rows, before each player. The pieces must only more one square at a time, diagonally and forwards. If an opponent's piece stands in the way, there is no retreat,—the player must either advance or take his adversary's piece. A piece can only be taken, however, when there is a vacant square directly behind it; the attack-ing piece is lifted over and placed on this vacant square, while the piece leaped over is removed from the board. The object of the game is either to take all the adversary's pieces, or to hem them in so that he cannot play. The game increases in interest towards the clos sary's first line become king, that is, their power is doubled, and they can move backward or forward to all parts of the board. The game of draughts does not

all parts of the board. The game of draughts does not require so much science as chess, but is a favourite recreation with a great number of people. In Prance the game is called les Dames, probably on account of its having been always very popular with ladies.

DRAUGHTSMAN, drufts'-man (Ang.-Sax.), one who is skilled in the use of the pencil. A mechanical draughtsman is one who is skilled in making drawings of machinery, diagrams, maps, and plans, in which the use of mathematical instruments is involved.

DEAWDACE, draw'-bak (Ang.-Sex.), in Com., is a term used to signify the sum paid back by government upon certain classes of goods exported, on which duty has already been paid. The object of this is, obviously, to enable the exporter to compete in the foreign mar-ket on an equal footing with those of other nations. ket on an equal footing with those of other nations. If the amount of drawback exceeds the sum paids as duty, then it partakes of the nature of a bounty (which see). The general principle of drawbacks is not objectionable, though they may be so in particular cases. "To allow," says Adam Smith; "the merchant to draw back, upon exportation, either the whole or a part of whatever excise or inland duty is imposed upon domestic industry, can never occasion the exportation of a greater quantity of goods than what, would have been exported had no duty been imposed." Such encouragements "tend not to overcure that balance

## Drawing

by means of a untilless. Buckles this field of balders, which is sometime towards blinks brings, there are two other sures, eaties, thereing an owner-balders, and rolling bredges. The thereing brilling moves in an host-amen plane on a plane, which shapes one and of it for the pair on which it wister the other end takes the forms of an are at a tireles, hand works on small reliers, that the other and the form of an are at a tireles, and forwards by a wheel which store the forms of the party of the same purpose, and is moved indiversely, and forwards by a wheel which store is a factor of a bridge of some length over a space in the quarte of a bridge of some length over

which works he areas, and lorward by a wheel which works he areas, the lorder of some length over a total triver, to udmet of the passage of matted vessels. Battwine, draw-lay (Ang Bax), the art of deliminating objects in outline on a flat surface, without militaries of the word, which, in a more extended sense, is also taken to eightly any finished work of art, with all the necessary effects of light and shade executed in penol; cravon, Indian ink, sepia water suplays, and in penal; cravon, Indian ink, sepia water suplays, and in the necessary officis of light and shade executed in penol; cravon, Indian ink, sepia water suplays, and in penal; cravon, Indian ink, sepia water suplays, and in penal; cravon, Indian ink, sepia water suplays, and its penal; cravon, Indian ink, sepia water suplays, and its penalcian outline that the productions of an artist are chefly marked. A work that is faulty in diswing, however excellent the manipulation may be, is of hills worth, and is unsatisfactory to the eye Glood drawing is characte used by power, freedom, grace, and accuracy, and these qualities can only be acquired by study and constant practice. Sketching, or landsoups-drawing, is perhaps less difficult than any other brameh of the art, because its imperiections can be here readily detected; but it is a far more difficult task to delineate the human figure, and, by a few bold strekes, to produce outlines whoh present such expression, combined with treedom of treatment, as those from the product of Flaxman Retsach and Julius Schnorr The stadest who would excel in the representation of the figure, the construction of the aleleton the functions and positions of the muscles, and the varied

おいればずる 人名の佐藤清学をもちらとうと





Fig 2

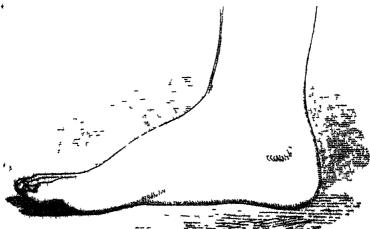


Fig. 4,

gertain this of perspective. The apparatus re-policy is against consists of a frawing-board made prises of field or makegany, clamped at the edges poises of field or makegany, clamped at the edges to present it from warping; some pencils, india-ber, a Tagmare, and a box of simple mathematical ratherits. The manus may be demanded and the nhauts. The paper may be damped and pasted is edges of the drawing board, and then allowed of when it will be found to present a beautifully to dry when it will be found to present a beautifully surface, and eyen surface, or it may be fastened to it with small pide that have broad flat heads and are known as drawing-pine. After practising at the form-ation, of dementary figures, such as straight lines, encrose, suchangies, triangles, circles, and ellipses or ovals. There are no better examples for study than the leaves of various plants. When these can be skutched with various and freadom, drawings may be made with restinces and freedom, drawings may be made from vasce, cups, articles of furniture, and simple plaster casts. From this the learner should proceed se study of perspective, and give roundness to his and shade, varying his work by copying from the flat, as it is technically termed, heads and figures in crayon at it is technically termed, heads and figures in crayon from examples by Julien, and animals and landscapes from the productions of Cooper, Harding, and Prout, which may be purchased or hired for a trifting amount. It is tamples for practice, we give on Plates KLIV. All KLIV., some useful and interesting drawing-sopies of various kinds. In fig. 1, Plate KLIV. for instance, the best manner of delineating the followed of a willow-tree is given. Fig. 2 is a representation of a fuchsia-leaf. After copying this, we would recommend the pupil to get a similar leaf, and place it in various positions, so that the light and shade will be variously disposed. This will slidted excellent practice, and will accust on the pupil to draw practice, and will accustom the pupil to draw or aketch from nature. In fig. 3, representing the foliage of the clm, the pupil must put the shading initiage of the clin, the pupil must put the shading in with as few strokes as possible, so as to obtain the least appearance of the copy. The manner of putting in the foliage, &c., of an ash-tree is exemplified in fig. 4; the strokes must be given in a quick, free manner, and the branches in graceful curres. The accesspansing fig. 1 illustrates the manner of defineating take foliage. The branches of an oak are twisted the additional conservations and must be free and loose without the case totage. The branches of an our are where in addies variety, and must be free and loose, without formality. In figs. 5 and 6 are exemplified the proportions of the human face. On Plate XLV. we supply a vary nice drawing-model. The drawing must have be carefully outlined; then the details of trees at in the house should next be finished, and the part is; the house should next be finished, and the most distinct parts; thereafter finishing the trees and the durk foliage which relieves them; and, lastly, the fareground and water. Plate LLVI, gives an example of figure-drawing, by making a careful copy of which the pupil will be greatly benefitted. In this summered figs. (3 and 4) we furnish models of hands, which require careful treatment. It will be well to remember that the hand is of the same length. e face. The foot in profile (fig. 4) is nine eyes sith and three in height. (See Isomerucal tree, Muchanical Drawing.)—Ref. Robert Heaverne, MECHANICAL DRAWING.)—Ref. Robert Sooff Signer Self-aid Cyclopedia; the works of Dela-motte, Amor Penicy; and the publications issued under the authority of the Department of Science EASTER AND QUARTERING, so old and barbarous

presence and Quarenters, an old and impherous pressumes, still in force, which is inflicted upon those whoses found guilty of treason. The sentence is, that his presence is of rawn to the place of execution on a medical that he behanged by the lock till he be dead; that he had be accorded from his body; and that his body as divided into four parts, or quartered. When londy as divided into four parts, or quartered. When leading are found guilty of treason, size quartering is

Originally the paper was strotohed be and by presence from behind: the ever, is found simpler and more p of the wet paper are gined or pasted to the the whole allowed to dry regularly. It is that the board should be so constructed a hable to warping. This is effected by held the piece or pieces of wood by an edging of

the grain of which runs in a contrary directly DRAW-PLATE, a steel plate used in the m of metals, for the purpose of converting them is or bars. It is furnished with a series of gr holes, through which the metals are drawn. draw-plate is also applied to a metal plate put in of a fire or over the front opening of a freplat

of a fire or over the front opening of a freeless, to order to cause the air to pass through the fire, instead of over it, in its way to the chimney.

DRAY. (See Yautcles.)

DRAYS, dreems (Du. droom, Ger. frank), are disfined to be "trains of ideas presenting themselves to the mind during sleep." It frequently, if not always, happens during sleep, that while some of the manual faculties are suspended, others are still active, and are busy with numerous ideas which succeed each other with more or less regularity. This is dreaming. This characterized by an absence of consciousness with regard to external things, and an entire suspension of voluntary control over the current of thought, so that the principle of suggestion—one thought calling and voluntary control over the current of thought, so task the principle of suggestion—one thought calling and another according to the laws of association—has un-limited operation. The subject of dreams is one of the most intricate and perplexing in the entire field of mental philosophy, and it has not yet met with that amount of attention that its importance demands. Sirwilliam Hamilton believes that, "whether we received our dreams or not, we always dream." To have a recollection of our dreams does not prove that we have not dreamed; for it can often be shown that we have dreamed, though the dream has left no trace upon our memory. Many other philosophers have held the same opinion; among whom Kant, who distinctly maintain that we always dream when salesp; that to coses the dream we arrays arount when sales; 7 that the coase to dream would be to cease to live; and that those who fancy that they have not dream have only forgotten their dreams. The phenomena of dreams along that to prove what is now generally believed to be true; that different mental faculties have different portions of the begin suproposited to them. brain appropriated to them, and through which they act. One of the most remarkable features of dreaming is the rapidity with which the mind passes through a long series of events. Whole years may seem to the dreamer to have elepsed, and a multisude of mages may have been successively piled up before him, thou the time occupied therewith is known to have occup-only a few minutes, or even a few seconds. The only a let industry, drawn involving a long succession of supposed symptohas often originated in some circumstance that aroused the once originated in some curvametance that arouse aleeper, and taken place within the shock space proceded the state of full consciousness. The district of a dream is often to be traced to some sensions ing or impression. Thus Dr. James Cracery have one concession gone to bed with a vessel of hot will his feet, dreamed of walking up Mount Bins, a ing the ground warm under him; and on such sion, having thrown off the bedelothes in his ab sion, having thrown off the bedelothes in his sheep, dreamt of spending a winter at Hudson's Bay. Reid, having a badly-dressed bilists on his he dreamt of falling into the hands of Indians, and be scalped by them. We believe that many more of preasur of falling into the hands of Indiant, a scaled by them. We believe that many me dreams may be traced to this source that ago imagined, and that many of those unpleases that are sometimes found to precede librar consisted by facility or satestions of wint ordinary waking state we are unconscious. This way that indigestion is so fruitful a case

Dreams

pleasant dreams. Of the fire senses, touch is the most excitable during sleep, and most fingeredly modifies the character of our dreams. The sense of hearing is the next; and the least excitable of all our senses is that of sight. Our before in the resulty of the scene brought before us, and in the presence of external objects not before us, are among the most curious and important of the phenomene of arcams. Everything seems real and rivid before us. Dr. J. Cunningham attempts to emplain this, by maintaining that the affinity that arists between sensations and ideas is greater than is commonly inegined, and that "all thought is objective and pictorial." "We cannot think," he says, "without thinking of something, and that that something must be thought of a outside the mind. It is not our thoughts, but the things we think mind. It is not our thoughts, but the things we think of that are present to our consciousness; and thus our thinking consists of a series of visious."—(Macmillan's Megazine, 1802.) Be this as it may, we believe that this phenomenon cannot be adequately explained by referring it to "a complicated case of association," reserving it to "a complicated case of association," as is sometimes steempted to be done. It is said that dreams turn most frequently upon what has occupied our thoughts during the day, and that the most reseent associations occur more readily than those which are more remote. This, however, we do not think to be so much the case as is supposed. death of a friend may occupy the chief part of our thoughts for weeks or months, and yet during all that time he may never once appear to us in our dresus; and it is only when he ceases to occupy so great a part in our thoughts during the day, that he begins to appear to us in sleep. "It is not always," says Sir W. Hamilton, "the subjects that occupy us most when awake that form the matter of our dreams; and it is curious that the persons the dearest to us are precisely those about whom we dream most rarely. The mind of the man of business, when he is away from home most frequently returns in sleep to the scene of his labours, and it is only, perhaps, some time after be has again returned home that the beautiful scenery his insource, as a sub-base has again returned home that the beautiful scenery and pleasant associations that occupied his mind when away again recur to his thoughts in sleep. We are rather inclined to the opinion, that, as a general rule, those faculties are most in action during sleep that a general rule, for it is well known that frequently the mind may be so exercised during the day that sleep can only be obtained with the greatest difficulty at night; and in the same way particular faculties may be so excited during the day as to continue in action also as excited during the day as to continue in action also in sleep; but generally a due amount of action demands a due amount of rest. But the phenomens of dreams are yet too little studied to enable us to assert much with certainty regarding them; and in all probability they differ very much in their nature and character in different individuals. It is commonly said that nothing supprises us in our dreams. This, however, is by no means uniformly the case. We do, seet, is by no means uniformly the case. We do, indeed, often see persons that are dead, or in a distant country, or witness events that have happened long ago, in our dreams, and feel no surprise; but sometimes, also, the idea that the person is dead or in a distant country, or that the event is matter of history, also occurs to us; then we are surprised, and we begin to think that we are dreaming. Or we find ourselves on some desert island, or the inhabitant of some gorgroup palace: we are surprised, and begin to cogitate how we came there. It is said, too, that there is a great goods pance: we are surprised, but negin to cognate how we came there. It is said, too, that there is a great distinction in the ordinary play of the emotions; that we may walk on the brink of a precipice, or see ourselves doomed to immediate destruction, and yet feel most the slightest emotion of fear; that we may perform the most rithless crime without computation, and see what would in our waking hours cause us unmitigated grief, without the smallest feeling of sorrow. This is by no makes immissingly the case, or even, so far as our own personnal empersone goes, is it so generally; but here, too, we believe that the nature of the dream differs in different individuals. Frequently the scenes that appears to us in our dreams are of the wildest and most arrows description. All probabilities, and even possibilities, of time, place, and giroumstance, are violated, and yet they reachy strills us as untrue or improbable. There is also in several a remarkable want

of coherence in our dreams, and a complete incongruorances in the thoughts and images that pass through
our minds. Sometimes, however, the very reverse of
this takes place, and the reaconing or imaginative
powers may possess a strength unknown to them in
their ordinary condition. Thus Condences saw in his
dreams the final steps of a difficult saleulation that
had puzzled him during the day; and Condiliae states
that when engaged with his "Cours d'Eude," he
frequently developed and finished a subject in his
dreams which he had broken off before retiring to rest.
The circumstances under which Mr. Coleridge composed his fragment called "Kubis Khan" have been
described by himself, as follows:—He had fallen asleep
in his chair while reading in "Purchas's Pilgrimage"
of a palace built by Khan Kubla, and remained asleep
for about three hours, during which time, as he himself tells us, "he could not have composed less than
two or three hundred lines,—if that, indeed, can be
called composition in which all the images rose up
before him as things, with a parallel production of the
corresponding expressions, without any sensation or
consciousness of effort." On waking, he instantly sat
down to commit it to paper; but, after having written
so much of it, he was called away by a person on business, and when he returned to the task, the poem had
vanished from his memory. The popular belief that
there is something supernatural in the hasture of
dreams, and that frequently in this way events are
revealed that are about to happen, has been held from
the carliest times, and is shared in by many wellinformed persons in the present day. Many of the
instances of remarkable dreams may, doubtiess, be
explained from natural causes, but there say others so
well authenticated that we cannot altogether disoredit explained from natural causes, but there are others so well authenticated that we cannot altogether discredit them, that are manifestly unexplainable by any natural means. If we admit the testimony on which these dreams are given, we are driven to confess that they arise from causers and are subject to flows, of which we are ignorant. "At present, we see only the particular are ignorant. "At present, we see only the particular interpositions, particular events, belonging to another system, which we call supernatural, which is governed, however, doubtless, like our own, or the natural system, by general laws, and which moves, perhaps coordinately with this to a common end, although we know not the laws of that system, nor to a connection between it and our own."—(English Cyclopedia.) It is, indeed, an interesting question,—what purpose do dreams serve in the animal scouomy? There can be little doubt, we think, that they exert a certain inlittle doubt, we think, that they exert a certain in-fluence upon the character. "A particular tendency," says Sir William Hamilton, "may be strengthened in says Sir William Hammion, "may be strengthened in a man, solely by the repeated action of dreams." "Dreams," says Sir B. Brodie, in his "Psychological Inquiries," "are, at any rate, an exercise of the imagination. We may well conceive that one effect of them may be to increase the activity of that faculty during our waking hours; and it would be presumptions of the state of the s during our waring nous; and a would purpose beyond this, in the economy of percipient and thinking beings." "If," says Pascal, "we dreamt every night the same thing, it would perhaps affect us as powerfully the same thing. as the objects which we perceive every day. And if an artisan were certain of dreaming every night for twelve hours that he was a king, I am convinced that he would be almost as happy as a king who dreamt every to elve hours that he was an artisan." Hence it is of some pe amost as happy as a king who dreamt every twelve hours that he was an artisan." Hence it is of some importance to study the art of procuring pleasant dreams, on which subject Dr. Franklin has an essay. A more accurate knowledge of the nature of dreams would tend to illustrate many of the mirre obscure mental phenomens. The analogy between dreaming and insanity is very striking. There is the assis wild disorder of the mental faculties, the same rapid and tunultuous thoughts, the same rejoid apparent to the most recent written on this subject is M. L. F. Alfred Maury, whose work, "Le Sommeil et les Rêves, Etudes Physhologiques aur ces Phénomènes et les divers Rists que all raitachent." Paris, 1801, is well worth the attention of any who are desirous of studying this subject. He cande unmerons experiments upon hintself, and had a second person by him to record what he might say or what gratiurs he might make during sleep, and to wake tim anddenly at any moment that might seem to promise a favourable

result. Many of his observations, however, we are inclined to regard as peculiar, and not to be generally characteristic of dreams; and homes we are inclined to question some of the general principles which he deduces from them; but it is only by the multiplication of such a knowledge as to be able to distinguish the general from the particular, the rule from the axception. Deed from the particular, the rule from the axception. Deed from the particular, the rule from the axception. The general from the particular, the rule from the axception. The general from the particular, the rule from the axception. The general from the particular, the rule from the axception. The general from the purpose of bringing up shells, &c. The common cyster is obtained by dredging. The dredge employed is a bag-net, composed of iron rings linked together so as to form meshes. The mouth is made of sheet-iron, and acts as a scoop when the dredge is lowered, and drags along as the bost sails over the cyster-beds. Dredging has lately been much practised by naturalists for the purpose of investigating animal life in the ocean. The late Professor Forbes, by a series of interesting experiments, was true enabled to show that there are zones of animal life corresponding with that there are zones of animal life corresponding with different depths of the sea. The naturalist's dredge is of much lighter construction than that of the oyster dredge, and recembles more a shrimp or sole-dredge but it varies according to the bottom to be explored.

but it varies according to the bottom to be explored.

DEBDGING-MACHINE, a machine employed for the purpose of clearing out or deepening the channels of rivers, harbours, &c. The most effectual machine is the bucket dredging-machine; it is in the form of a large barge with an open hold. A long stage, in the form of an inclined plane, overhangs the side of the barge, having a strong wheel at each end working an endless chain. To this clasin a series of perforated iron buckets is attached, each with a shovel-shaped steel mouth projecting on one side. The buckets, which ascend on one side of the inclined plane and descend on the other, are so contrived as to descend which ascend on one side of the inclined plane and descend on the other, are so contrived as to descend empty. On reaching the lower wheel, the shovel-shaped mouth digs into the bottom, and as it turns round is partially filled with rubbish, and passes upwards to the upper wheel. As it is inverted while passing over the upper wheel, it discharges its contents into the open hold of the barge. Every succeeding bucket on the endless chain continues the action, and the depth of working can be increased or decreased by changing working can be increased or decreased by changing the inclination of the framework. The more powerful dredgers, instead of emptying the buckets into their own holds, discharge them into other barges drawn up alongside. Dredging-machines are worked some times by steam-engines, sometimes by the action of an undershot wheel, and sometimes by horse-power,-the undershot wheel, and sometimes by horse-power,—the horse moving round a circular path in the barge. Some very large and powerful dredging-machines are in use on the rivers Tyne and Clyde. One of the most perfect forms of dredging-machine was that constructed by Mesare. Bury, Curtis, & Kennedy, of Liverpool, for deepening the bay of Santander, in Spain. \*#he engine was a side-lever, low-pressure condensing marine engine, of 25-horse power, having a cylinder of 28 inches diameter and 3 feet stroke (crank making 28 revolutions per minute); the cylinder was supplied with abort D-valves of brass. The air-pump had a diameter of eighteen inches, lined with brass \*#ho of an inch thick, with a brass lined with brase  $\frac{1}{\sqrt{2}}$ , of an inch thick, with a brass bucket, brass discharging- and foot-valves; rod of wrought iron, cased with brass. The engine was fixed on a cast-iron bed-plate  $\frac{1}{2}$  inch thick, secured to the keelsons of the vessel by aixteen  $\frac{1}{2}$ -inch thick the inch bolts; the condenser was cast solid on the bed-plate. The side-levers were 9 feet 31 inches long, 19 inches broad in the middle, and 14 inch thick in the plate; the main centres were keyed into the contre on each side. There were two fly wheels on the crank-shaft, each 13 feet 6 inches in diameter, the rim being 9 inches deep by 5 inches broad on the edge. The crank-shafts were constructed of cast iron, of 7 inches diameter in the journals, and supported at the ends by brackets fixed to the side of the boat. The engine was provided with a governor, which was driven from the crank-shaft by a bult and pulleys. The framing, columns, and crank pedestals were east in one piece. The boiler was il feet long, 8 feet wide, and 8 feet high, with steam-chest 5 feet long, 1 feet 6 inches wide, and 1 foot 8 inches high: With respect to the dredging machinery, the spar-wheel,

on the fly-wheel shaft which connected the engine on the nywheel sums which connected the engine and other wheels for working the machine, was 6 feet 6 inches in diameter to the pitch-line, 24 inches pitch and 8 inches broad on the edge; and on the piten and a neues or our on the range; and a hant of this last-mentioned wheal there was fixed a wheel of 4 feet 5\frac{1}{2} inches diameter, 3\frac{1}{2} inches pitch, and 10 inches broad on the edge, which worked into a wheel keyed on the bucket-abat, 8 feet in diameter, of 3\frac{1}{2} inches, pitch, and 10 inches broad on the edge. The main, or bucket-abatic on which the 3-foot wheel was keyed, was of east iron as far as the coupling-boxes on each side; the ends of this shaft rested on pins of 8 inches diameter, fixed into the tumbler-shafts, which were of wrought iron, and turned to receive the tumblers. The shaft for the lower tumblers was also of wrought iron, and worked in chilled cast-iron bushes. The upper tumblers were square, with hoops of wrought iron a inches by 1\frac{1}{2} inch (steeled on the corners); the flange on one side was made loose for the purpose of putting the hoops haft of this last-mentioned wheel there was fixed a was made loose for the purpose of putting the hoops on. The lower tumblers were square also; the part under the bucket-link was chilled. There were four steel knives in each flange, for the purpose of cutting the soil before the bucket. The hangers, for carrying the bucket-frames, were of cast iron, the inner one firmly bolted to the side-framing; the outer one was fixed on the end of a transverse beam. The bucketframes or ladders were 48 feet long between the centre of the upper and the centre of the lower tumblers; or one upper and the centre of the lower tumblers; they were made of the best English oak, each side in two pieces, 12 inches by 6 inches, and bolted to the cast-iron brackets at each end with 12-inch bolts. The buckets were made of boiler-plate half an inch thick, and welded at the corners. The bucket-links were of wrought iron, with a ring of steel 12 inch thick welded into the eye of each link. The rollers on the bucket-frame, for carrying the buckets, were 9 inches in diameter. The coupling-boxes on the bucket-hait were for the purpose of disengaging the tumbling-shaft when one row of buckets was required to work. These coupling-boxes were also fitted with to work. These coupling-boxes were and attention a friction-strap to prevent accidents to the machinery, a friction-strap to prevent accidents to the machinery. should the buckets meet with any obstruction. The mitre-wheel on the bucket-shaft, 2 feet 3½ inches diameter, worked into a mitre-wheel keyed on the end meter, worked into a mitre-water keyed on the ead of an upright shaft; and on the lower end of this shaft there was another mitre-wheel, which worked into a mitre-wheel keyed in the chain-barrel shaft. The barrels for hoisting the end of bucket-manner were of cast iron, with a brake-wheel fixed on the end for lowering the frame when the barrel is disconnected from the intermediate shaft by the couplingbox; the handles of the coupling-box and also the brake-handle were placed on deck. The rope gearing for hauling the boat forward received motion from the upright shaft in the following manner:—A mitre-wheel was fixed on the upright shaft, working into another mitre-wheel on the intermediate shaft, and on another mitre-wheel on the intermediate shaft, and on this shaft there was a spur-pinion working into a wheel on the capstan-head shaft. The capstan-heads were of cast iron, with a coupling-box and friction-wheel, the handles of which were placed on deck. On this shaft there was a pulley two feet in dismeter, which was driven by a belt from the fuzze-pulley before mentioned

Danss, dres (from Fr. dresser, to make straight), a term applied to the body-coverings used by all but the most uncivilized human beings for the purposes of warmth and ornament. In tropical climates, the origin of dress was most probably ornament; but in proceeding from the equator to the poles, man would find it necessary to provide himself with clothing which would protect him from the inclemency of the weather. would protect him from the inciencing of the weather. Skins and furs, and those vegetable products which could be manufactured readily, would, in all likelihood, form the first garments; while with the progress of civilization, more complicated textures, such as those of wool, hair, flar, silk, &c., came into use. The dress adopted is different nations differs in form and in the substances employed, but in general is actived to the climate in which it is worn, and the occupations of the people. In most of the countries of Europe, among the upper and middle classes, one style of dress adopted, varying at times according to the diotates of fashion. But all the slight changes of late years, with

word is often used as an abbreviated term for the Glacial Drift of the Pleistocene period. (See GLACIAL

DEPOSITS.) DEVLL, drill (Du. drillen, Sax. thirlian), a tool used for boring holes in wood, metal, stone, bone, &c. It stone, bone, &c. It is formed in different ways, according to the kind of hole it is required to make, and the material which it has to penetrate.

Drills for boring iron have pointed heads, with sharp edges projecting from them, that cut in different directions. Those for boring wood are like an auger or large gimlet, or they are broad and flat, with a pro-jecting spike in the centre and cutting edges on either side : drills of this form are called centrebits. These tools are worked by a rotatory motion im-parted to them by a cranked handle, having a socket and spring at one end to receive and hold the drill, and a boss at the other, against which the workman presses his chest; or by a bow of steel, with a strong piece of catgut at-tached to it loosely enough to admit of its being passed once or twice round a pulley, through the cen-tre of which the tool passes. The workman presses the drill against the material that he is boring by his chest, which is protected by a plate of metal. A very fine example of a drillingmachine, emanating from the workshop of the celebrated mechanicism Sir Joseph Whitworth, of Manchester, may be here described. This machine answers all the purposes for tools of this kind are

its construction and motions, and have the same letters of reference. A. A. A. A. indicate the form of the cast-iron framing of the machine, upon which all the

very few exceptions, seem to be tending towards a more simple and appropriate style of dress.

Dairr, drift (Dan. drift), in Geel., a term signifying that which is driven; "as drift-wood, wood carried plate TT, intended to reat solidly, and without any down by rivers, and driven by tides and currents to distant shores; sand-drift, and driven and accumnitate to the workshop of the main frame a strong bracket is lated by three strong bracket is upper portion of the main frame a strong bracket is

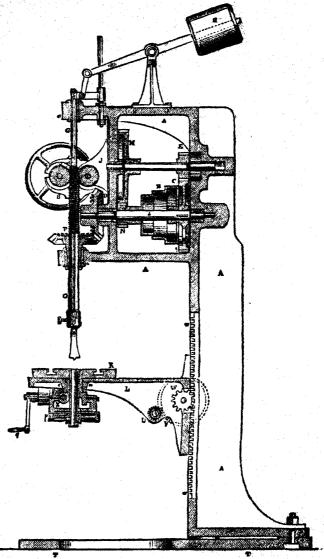


Fig. 1.

rig. 1.

intended. Fig. 1 is a

vertical section in the plane of the axis of the driving.

cons and work-table. Fig. 2 is a front view of the spindle b and back-speed spindle of the machine, agreeing in its letters of reference with the spindle b and back-speed spindle of the machine. Upon the spindle b and back-speed spindle b, of three fig. 1. The other figures are drawings of parts of the speed.

The other figures are drawings of parts of the speed.

The speed-cone B is loose upon the shelt, and only a speed spindle of the spindle b. communicates motion to it by means of the spur-wheel C, which is keyed upon the spindle, and to which the cone can be attached by a stud-pin and nut

#### Drill

at c. This wheel gears with the pinion E, on the same spindle which carries the wheel M'; this in turn gears with the pinion N, which is fast upon the end of the cone B, but runs loose upon the cone-spindle b. This arrangement is in every respect the same as the ordinary back-speed of a lathe, and serves the same

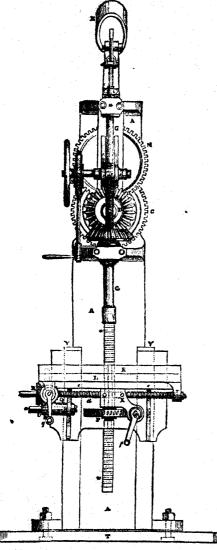


Fig. 2.

purpose. Supposing the back-speed removed, the cone, being driven by its belt, causes the spindle b to revolve, in consequence of its attachment to the fast-wheel C, and at the same time gives motion directly to the bevel-pinion D, on the end of the spindle. This again gears with the bevel-wheel F, on the drill-spindle GG, which is free to alide vertically in the eye of the wheel, while at the same time it is prevented

## Drill

from revolving in it by a sunk feather. By this means three different degrees of quick speed may be communicated to the drill. But let the back speed be in gear, as represented in the drawing (fig. 1), and let the stud-pin c be removed, and the cone thereby loosened from its attachment with the wheel C, the

notion being communicated to it will not drive the shaft b directly, as before; but the pinion N, being fast upon it, will give motion to the wheel M, upon the same spindle with the pinion E. This last will therefore make the same number of revolutions as M, but being less in diaber of revolutions as M, but being less in diameter, will convey a proportionally less velocity to the wheel C, with which it gears, and which it consequently drives with a speed diminished in the ratio of the gearing pairs. Now the wheel C, being fast on the shaft b, conveys to the bevel-pinion I) the same diminished speed, and this cash to the dell'applied G C. This and this again to the drill-spindle G G. reduced speed may of course be varied, as before, by placing the belt on one pulley or other of the speed-cone. Behind the pinion E there is a recess cast in the framing, to allow it to enter when the back-speed wheels are to be thrown out of gear: and it may be remarked that this speed-gear is only required to be in action when the machine is employed in boring holes of up-wards of an inch and a half in diameter. The wheel F is cast with a long hollow boss, which is turned and fitted into a brass collar in the lower branch of the carrying-bracket, as seen in fig. 1. This collar is kept in its place by a cover bolted over it, as shown in fig. 2. As already observed, the drill-spindle passes through the wheel F, which thus serves as its lower guide. The upper end of the spindle is at the same time guided in a collar similarly fitted into the time guided in a collar similarly fitted into the upper branch of the bracket at a, and is thus guided vertically in ascending and descending. In the drawings it is shown at the lowest limit of its travel. To the top of the drill-spindle is attached the back-weight H by a jointed lever and guide-link, which embraces the top of the spindle and moves upon a vertical guide-rod, kept firm in its place by having its lower end held by a screw nut in a socket cast in the brucket, in the manner of a bolt, a ruff forged upon the lower end of the rod answering to the upon the lower end of the rod answering to the head of the bolt. The drill-spindle is itself screwed towards the middle of its length, it is then embraced by two screw-wheels (J, J), between which it turns, and which serve the purpose of a unt to feed down the spindle in the operation of drilling by an arrangement which will be presently described. K is the table upon which the article to be bored rests, and to which it can be held firmly down and adjusted by Theaded bolts and glands in the usual way when thought necessary. The table, it will be observed, is recessed and grooved to receive and retain the T-heads of the holding-bolts, as fully shown in the horizontal section, fig. 3, and the side view, fig. 4. When the article is much smaller in area than the surface of the table, the fixing bolt-head can be entered at any convenient point of the surface by the recesses k, k, and slid forward until it passes below the projecting ledges of the recess, where it is retained. The common mode of running two sets of inverted dovetail grooves at right angles to each other, lengthwise and across the table, seems, however, preferable to this mode of partially re-cessing the surface. The table is itself supported

cessing the surface. The table is itself supported upon the sole of the large carriage-bracket L, which is strengthened by two ribs cast on its under side. This bracket is attached to the framing A.A. by two pieces Y, Y, which are bolted upon it, and planed true to the angle of the inverted bevel edges of the broad face-rib of the main frame. These edges are also planed where they ment the oblique faces of the pieces Y, Y. By this means a joint is formed which allows of a sliding motion vertically; but slove not admit of any deviation laterally. When the alides become loose by waaring of their surfaces, the pieces Y, Y admit of being

Drill

Drill

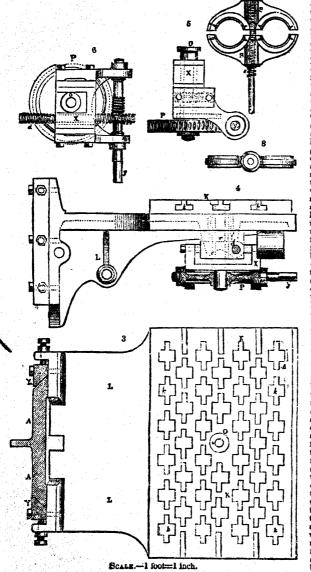
tightened by means of pinching screws fitted against tightened by means of purchase states against them through continuous sough cast on the bracket.

This arrangement is fully explained by figs. 3 and 4.

This bracket is raised and depressed by means of a which will either be raised or lowered according as the crank is turned in one direction.

of the machine, so as to form an integral part of it. By turning the hand-crank on u, it is thus manifest that the motion will be transmitted to the bracket,

or the other. The table K has or the other. The table K has a double movement upon the sole of the carriage-bracket; one movement is circular, and the other is in the direction of the length of the table. The circular movement is effected by means of the hand-orank p upon the spindle #, carried in bearings formed upon the box X, which thus serves as a centre of rotation. On the spindle y is formed a worm, which, gearing with the worm-wheel P on a stud projecting downwards from the table K, conveys the motion of the handle p to the table. This arrangement is well shown separately by the plan, fig. 6, and the elevation, fig. 5. This last corresponds to the view orresponds to the view given in fig. 2. Opposite views of it are also given in figs. I and 4, the last on an enlarged scale. It will be observed that the stud on which the wormwheel P is fixed is cast bollow, and is fitted into the table K by a key at o, shown in fig. 3. The lateral movement of the table is effected by a different arrangement. A recess in the form of a parallelogram is east in the sole of the carriage-bracket L, with projecting ribs (e, e) on its under side, to serve the double purpose of giving strength to the sole plate and of forming guides, against which the cover of the travelling-box X may slide, the surfaces in contact being planed true for that purpose. The motion is that purpose. The motion is communicated by means of the hardle q (figs. 1 and 2) upon handle g (tigs. I and 2) upon the spindle which carries the bevel-wheel Q, seen in fig. 2, and partially in fig. 1; also se-parately in fig. 10. This spindle has its bearings attached to the bracket L, and its wheel gears with the equal wheel R, upon the end of the screwed spindle d, which has its bearing (r) also attached to the sole-plate of the attached to the sole-plate of the carriage-bracket, and works in a long nut or internal screw formed in the cover of the travelling-box X. (See fig. 2 for the general arrangement, also figs. 4, 6, and 9.) By turning the handle q, it is thus clear that the piece which serves the nurses of a nut on the the purpose of a nut on the screw d will be carried along in screw a will be carried along in the direction of the length of the serew; but the nut being attached to the table K, the whole will be moved simulta-neously in that direction. By means of these two motions, any point of the table K can be brought under the axis of the brought under the axis of the



brought under the axis of the drill; and by the means of verticate and expansion of the spur-pinion U, shown in combination by figs. 1 The feed of the tool during the operation of boring and 2, and separately by figs. 11 and 12. This pinion gears with the spur-wheel V, parally seen in figs. 1 and 2, on the same spindle with the pinion W, fig. 1, which the same spindle with the pinion W, fig. 1, which the same spindle with the pinion W, fig. 1, which the same spindle with the rack w, let into the frame AA the axes of these wheels are placed two pulleys, the

#### Drill

circumferences of which are embraced by the frictioncollars 8, 8 (shown in combination in figs. 1 and 2, and separately by figs. 7 and 8). The heirings of the axis being attached to the framing AA of the machine, it is obvious that the machine being in motion, if the pullers be prevented from revolving, the wheels J. J will likewise remain at rest; but the screwed

# Drinking Usages

of battalion drill in concert with the other companies of hattanton orni in concert with the owner companies of the regiment to which he belongs, and to proceed to siming drill, judging-distance drill, and target practice. In every regiment every soldier goes through a course of setting-up drill in the spring. The course of drill for each arm of the service's similar, as far as the alarmeter party gonderned, but the artillar remains the elementary part is concerned; but the artilleryman

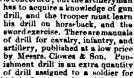




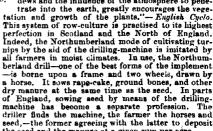
Fig. 9.

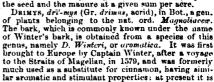
part of the drill-spindle revolving between them, some minor fault, which he has to go through in heavy part of the drift-spindie revolving between them, they will act as a stationary, and cause the spindle to descend through a space equal to one-third of its screw during every revolution. Again, suppose the pulleys and wheels tree, the screw of the spindle instead of descending will simply cause the wheels J, J to results on their wast through a space gould to one to revolve on their axes through a space equal to one

marching order.

DRILLING, in Agriculture, is a mode of sowing by which the seed is deposited in regular rows, equally distant from each other. "It has been practised by

distant from each other. "It has been practised by gardeners from time immemorial, and from the garden it has gradually extended to the field. In those countries where maize, or Iudian corn, is extensively cultivated, the seed is always deposited in rows; and during the growth of the plants, the soil in the intervals is repeatedly hoed and stirred to a considerable death. to a considerable depth, as is likewise the prac-tice in vineyards. This cultivation not only keeps the land free from weeds, but, by allowing the dews and the influence of the atmosphere to pene-





rarely employed.

DRINKING USAGES (Sax. drincan, to drink; Fr. usage, usage).—From the earliest times of remote antiquity, there have always been special usages connected with the custom of drinking. Amongst the ancient Hebrews, the drink-offering constituted one of the most solemn parts of their religious ceremonies. The patriarch Jacob poured out a drink-offering on the pillar of stones which he had erected to mark the place where he had talked with God (Gen. xxxv. 14). In the 15th chapter of Numbers there are special directions for the pouring out of drink-offerings of wine with the burnt-offerings, to be "a sweet savour unto the Lord." Amongst the ancient Greeks and Romans, the pouring out of libations to the gods was an ordinary religious ceremony. They were not only offered before solemu prayers, but also before meals. In the latter case, the host, before the guests began to eat, poured a small quantity of whe upon the floor, as a sort of propitation to the gods. This practice was somewhat equivalent to our grace before meat. It was also the custom at times to drink to the health of the guests. From usages such as these, in after-time, arose the custom of pro-







Fig. 12.

Fig. 10. Fig. 11.

tooth during every revolution of the screw. Now. between these extremes my amount of feed or downward motion of the drill-spindle may be obtained by simply retarding the motion of the wheels, by means of the friction-collars S, S, which embrace the small pulleys on their uxes; for the friction of the collars being less than to prevent entirely the motion of the wheels, and, at the same time, greater than to allow a tooth to pass during a revolution of the spindle, a downward motion of the spindle must thus be pro-duced at pleasure, by the contrivance of the friction-collars, shown separately in figs. 7 and 8. These collars are formed in two halves (8 8), with bosses joining the segments, pair and pair; these bosses are reverse-ecrewed internally, the thread of the one to the right, and that of the other to the left; and being placed in a rod (s s) correspondingly screwed right and left, they are made to approach or recede according as this rod is turned to the right or left, and to as this rod is turned to the right or left, and to embrace more or less closely the pulleys upon which they are placed. This screwed rod is prolonged, and has a bandle placed in its under end, by which the required degree of friction can be adjusted at pleasure (see fig. 2). The friction-collars are lined with copper, for the purpose of increasing the friction; for its manifestly of advantage to obtain as much friction on the pulleys as possible with the least amount of pressure. This arrangement has also the advantage of pressure. This arrangement has also the advantage of allowing the tool to be speedily withdrawn; for on slacking the friction-collars, the balance-weight H will raise the spindle in ordinary cases, and when the tool has a hold in the hole which is being bored, the balance-weight can be assisted in its office by the hand wheel placed on the axis of one of the wheels (J): the wheel and screw will thus for a time be converted into a pinion and rack. The figures of Whitworth's excellent machine, and the description of it, are taken from a useful and instructive work, one we commend to every mechanical student.—Mr. David Scott's "The Engineer and Machinist's Assistant."

Drill, in Mil., the general name given to the exercises by which a soldier is qualified for his duty. Squad, or setting-up drill, teaches him how to march in slow, quick, and double time, to go through his facing. and to perform certain simple evolutions from the halt or when marching; these are combined with pos-ture exercises, called extension motions, which tend to give the soldier a good carriage and an erect inilitary figure. When the recruit is dismissed from equad drill, which is taught to small batches or squads of men by a sergeant appointed for the purpose, he learns company drill, the manual and plateon exercise, and position drill; he is then competent to go through a course fore drinking. Waskall is evidently derived from this fore drinking. Waskall is evidently derived from this

origin; but it is attributed by some to an occurrence said to have taken place between Rowens, the daughter of Hengist, and the British king Vortigern. The king was at an entertainment at the castle of The king was at an entertainment at the castie of Heugist, and, during a feast, lost his heart to the fair Rowens, who, kneeling gracefully before him, presented a cup of wine, saying, "Liever kyning, wass kell (dear king, your health). The wes kell of the Saxons was, however, in use before that time, and was equivalent to the "Your health" of the present day. The practice of pledging a guest before drinking arose from a necessity of showing that there was no poison in the wine, or that there was no the guest while wine, or that there was no danger to the guest while he drank. It originated in the 10th century. The introduction of Christianity did not at all contribute to abolish the practice of using the wassail cup. It began, on the contrary, to assume a religious aspect; and in the larger monasteries, amongst the monks of old, the wassail bowl was placed at the right hand of the abbot in the refectory. It was handed round to each, and was called Poculum Charitatis. In the unieach, and was called Poculum Charritatis. In the universities a similar cup is still passed round, called the grace cup. In the dinners given by the public companies of the city of London, after the cloth has been removed, the master and wardens rise, and "drink to their risitors in a loving cup, and bid them all heartily welcome!" A silver cup filled with warm spiced wine is then handed round to all present. Some of the drinking-cups belonging to the priesthood in the Middle Arge were of the most costly workmanshin. Middle Ages were of the most costly workmanship. That of Thomas à Becket is still preserved; it is made of ivory, mounted with silver, and studded on the summit and base with pearls. Round the cup is an summit and base with pearls. inscription, "Vinum tuum bibe cum gaudio" (drink thy wine with joy); but round the lid, deeply engraved, is the restraining injunction "Sobrii estote" (be moderate). The word toast, with regard to drinking usages, is comparatively modern; it originated in the usages, is comparatively modern; it originated in the practice of putting a piece of toast in a jug of ale. According to "The Tatler," the word toast was first applied to the drinking of healths at Bath, in the reign of Charles II. A celebrated beauty of the time was in the large public bath, and a number of her admirers were standing around. One of them took a glass of water from the bath and drank to her health; while another who was standing by, half tipsy, offered to jump in, saying, that although he objected to the liquor, he would like to have the tosat. From that time the word was applied to drinking the health of any beauty at private parties, and, in time, all sorts of subjects were toasted at public and private feasts. Toasts also began to be accompanied by cheers; and Toasts also began to be accompanied by eneers; and at the present day, at large public banquets, toast-masters are generally appointed, who not only give out the subject of the toast, but lead the cheers which follow. Many drinking usages are connected with domestic events, and seem to have been handed down from ancient times. The custom of drinking at births, christenings, and marriages, can easily be accounted for; but the strangest usage of all is the practice of drinking at funerals. The wakes held in Ireland and orning at tonerals. The wakes held in tream and some parts of Scotland have been long maintained, and are still kept up by habit. They probably owed their origin to the want of excitement amongst the phlegmatic northern nations, and the long dark nights in a cheerless climate.

DEFERS, drinks (Ang. Sax.).—In order to dilute our food and repair the constant waste of fluids that is taking place in our system, a certain quantity of liquid must be taken into the system; and so necessary is must be taken into the system; and so necessary is this, that one can bear hunger better and longer than he can do thirst. Water is, undoubtedly, the natural drink of mail, and, in a perfectly healthy condition, is preferable to any other; but there are many others which, in certain conditions of the body, or through habit, may be taken, not only without injury, but with advantage to the health, if only taken in moderation; such as alsoholic drinks. Much depends upon the purity of the water one uses in the preservation of health, and the presence of even very minute quanti-ties of earthy or putrescent matter may produce the most pernicious results. Thus a very minute impreg-nation with lead is quite sufficient to develop all the symptoms of chronic lead-polloning if persevered in for a sufficient length of time. Again, an excess of the 702

saline ingredients which appear to be innocuous in small quantities, may produce a marked disorder of the digestive organs, and through them of the system generally. The injurious effects of the use of impure digestive organs, and through them of the system generally. The injurious affects of the use of impure water are also manifest in the extraordinary augmentation of the liability to attacks of such zymotic diseases as may at the time be prevalent. For the purification and preservation of water, numerous ingenious methods have been adopted; and one of the most approved is by means of patent filters, in which the water is pussed through alternate layers of sand and charcoal. (See FILTEL) Where there is reason, however, to suspect much injurious contamination, the process of holling should never be comitted; after process of boiling should never be omitted; after which it may be strained and filtered, and lastly agitated in contact with the atmosphere, in order to agitated in Contact with the stimosphere, in Order to restore to it its natural proportion of air. Much has been written for and against the use of alcoholic or fermented liquors; and it is one of those points on which medical men are very much divided. Without going into the arguments advanced on either side, we may give it as our opinion, that while in a healthy and natural state of the human frame, their use may be, and probably is, in some measure injurious; yet that, from the tear and west that most people have to endure in the present state of society, more or less of endure in the present state of society, more or less of alcoholic liquor is necessary to maintain the body in even the ordinary state of health. The quantity of drink required varies according to the climate, the nature of the solid food taken, and individual peculiarities. Most persons generally consume too much of liquids; and this is to be particularly guarded against during meals. By diluting the gastric juice, it presents the food from height property stead upon. Perfure the the food from being properly acted upon. Perhaps the best time for taking drinks of any kind is an hour or two after meals, as is shown by the degree of thirst which is then felt. Drinking large quantities of water is sometimes employed with beneficial effects in the cure of certain diseases. By exciting the vascular system and its connected secreting organs, it tends to remove from the blood various effets or noxious matters. On the other hand, a total abstinence from drink for two or three days is recommended as an effectual mode of stopping fluxes and of relieving catarris,

inflammations, and congestions. (See Com.)

Driven Ant, dri'-ver, the local name of a species of hymenopterous insects belonging to the fam. of Auts. DRIVING, FURIOUS, dri'-ving fu'-re-us (Sax. drifun, to drive; Lat. furiosus, furious), which was a misde-meanor by common law, was declared to be a statutory offence by 1 Gec. IV. c. 4, which declares that if any person shall be maimed or otherwise injured by reason of the wanton and furious driving or racing, or by the wilful misconduct of any coaciman, or other person having the charge of any stage-coach or other public carriage, the offender shall be guilty of a misdemeanor, carriage, the offender shall be guitty of a misdemeanor, and punishable as such by fine and imprisonment. By 2 & 3 Will. IV. c. 120, the provisions relating to stage-coaches were consolidated, and penalties imposed for furious driving, or other offendes against the act. This act was amended by 3 & 4 Will. IV. c. 48; 2 & 3 Vict. c. 66; and 5 & 6 Vict. c. 79. The provisions relating to backney and stage coaches in London will be found in 1 & 2 Will. IV. c. 22; 6 & 7 Vict. c. 86; 13 & 14 Vict. c. 17; and 16 & 17 Vict. c. 33.

DROITS OF ADMIRALTY. (See ADMIRALTY, DROITS

DROMEDARY. (See CAMEL.)

DEOMIA, dro'-me-a, a gen. of crustacea, of which the sponge-crab (Dromia vulgaris) may be taken as the type. The sponge-crab is furnished with two sharp

type. The sponge-crab is furnished with two sharp curved claws, which enable it to hold fast to pieces of sponge, meduse, &c.

DROFE, (See Bre.)

DROFE, (See Bre.)

DROFE, droft-se (Gr. hadrops, from hador, water, and ops, aspect or appearance), in Path., is a disease characterized by the accumulation of watery fluid in one or more of the shut cavities of the body, or in the areolar tissue, or in both, independent of inflammation. In a state of health, the capillaries, which ramify every part of the body, constantly pour out upon every surface, into the most minute cells as well as the great cavities, a watery fluid to moisten the parts, and thereby facilitate motion and prevent injury from friction. This watery fluid is speedily taken up

Drowning

by another class of vessels, called the absorbents, which carry it back to the general circulation. When the by another class of vessels, called the absorbers, which carry it back to the general circulation. When the healthy condition of these organs is impaired, either from the exhalents acting too powerfelly, or from the absorbents being deficient in action, an accumulation of fluid takes place, either in the general cellular membrane or in the natural cavities of the body. Dropsy is either active or passive. Active or soute dropsy is owing to excessive action of the exhalents, in consequence of increased action of the heart; it comes on suddenly and tumultuously, and sometimes can scarcely be discriminated from inflammation with serous effusion. It is induced by various causes; as exposure to a cold moist atmosphere, particularly when the body is in a state of perspiration from active exercise or long exposure to heat. A labourer "has been digging (perhaps) in a wet ditch in winter time, and he pauses to take his meal; or he has been unloading a waggon, and rides home some miles in a heavy rain that wets him to the skin; or he has been mowing in the heat of summer, and lies down to sleep upon the damp grass."
The perspiration is suddenly checked, and in the course of a few hours he becomes universally anasarcous. Chronic or passive dropsies are occasioned by defective absorption, arising, in some measure perhaps, from an enfectled state of the absorbents, strictly and anatomically so called, but more frequently, chiefly, and in some cases entirely, from undue fulness of the veins; this venous repletion being produced almost always by some impediment to the free return of the blood to the heart; as tumours pressing on the great blood-vessels, ossification of the valves of the heart, &c. When the veins are distended to a certain degree with watery fluid, the entrance of more of the same fluid through their sides is impeded or prevented; and when the distension is still greater, the aqueous part of the blood may even pass in the other direction out of the vessel. The difference between active and passive dropsy is chiefly in the rate at which the collection augments; in the one case the liquid is rapidly ef fused in quantity much beyond the natural amount of exhalation, in the other the exhalation goes on as usual, but the fluid exhaled is not taken back again into the circulating vessels with sufficient facility. Wherever there is a shut sac, or wherever there is a loose and permeable areolar tissue, there we may have dropsy. There are certain parts, however, where it is more generally met with than in others, and is hence distinguished by particular names; thus, when in the head, hydrocephalus; in the chest, hydrothorax; in the belly, acities; in the arcolar tissue generally throughout the body, anasarca. When the arcolar tissue of a part becomes dropsical, it is said to be adematous. Cateris paribus, those parts of the body become the most loaded with serous fluid, of which the arcolar tissue is plentiful with serous num, to when the disease, the first and loose. In the treatment of this disease, the first object is to get rid of the preternatural accumulation of watery fluid; the second, to prevent its collecting again; for dropsy is generally a symptom or sequence of other disorders, and rarely a disease of itself. In active or febrile annasarca general blood-letting is often of great advantage, as it not only helps to relieve the congestion upon which the effusion depends, but it tends to abate the undue action of the heart; in other cases, however, blood-letting would be very interesting the content of the cases.

and symmetrical, hypogynous, with a quinary arrangement of their parts, which are persistent and imbricate; anthers extrorse; styles several; placentas parietal; frait capsular, I-celled, with loculicidal debiscence; seeds numerous; embryo small at the base of copious fleshy albumen. The Droseracea are found in almost all parts of the world with the exception of the Arctic regious. They possess slightly said and acrid properties. The typical gen, is Drosera, the sun-dew, the species of which are interesting, from the peculiar irritability of the hairs on their leaves. The plant commonly known as Venus's fly-trap is a The plant commonly known as Venus's fly-trap is a species of Dionese, another genus of this order, and exhibits in a most striking manner this irritability. (See Dronga.) Some of the sun-dews communicate a beautiful purple stain to the paper upon which they are dried, and also yield a yellow colour when treated with ammonis. They may, therefore, be expected to furnish valuable dyes, and should be examined with this view by the practical chemist.

DROWNING, drown'-ing (Dan, drugner, to drown), is sufficiation produced by the immersion of the body under water, or, according to some, by the exclusion of stmospheric air from the lungs by any liquid. The necessity of air to life is well known, and any exclusion of it, for even a few minutes, produces death. When a human being unable to swim falls into the water, if it is not of great depth, he first goes to the bottom; but on account of the air in the lungs rendering the specific gravity of the body lighter than the water, he immediately rises again to the surface. The efforts made by him to maintain himself at the surface diminish the quantity of air in the lungs, and he again sinks to the bottom, but soon rises again; and this alternate rising and sinking may occur several times in succession. The air which is expelled from the lungs is seen to rise to the surface in the form of bubbles, and with every expiration the specific gravity of the body is increased; the powers of sensation and voluntary motion rapidly diminish, and the body settles at the bottom. A feeble motion may still be perceived in the chest for a short time, but that, too, ceases, and death ensues. In drowning, death is effected by the impure condition of the blood. The impure or venous blood of the system is constantly being carried to the lungs, of the system is constantly being carried to the lungs, where, being brought into contact with the air, its impurities are carried off, and it is converted into pure or arterial blood. When, by any means, as in drowning, the lungs are shut out from communication with the external air, this operation cannot be carried on, impure instead of pure blood is carried through the system, the brain is immediately affected, sensation and volition ranially diminish, and at length cease. and volition rapidly diminish, and at length cease. The period during which life may continue in sub-mersion varies in different persons. In some instances bodies submerged but one minute have been found to be lifeless; and in many cases recovery hus taken place after a submersion of eight or ten minutes. Occasionally, mimation has been restored after a subplace after a submersion of eight or ten minutes. Occasionally, numation has been restored after a submotive or febrile anasarca general blood-letting is often of great advantage, as it not only helps to relieve the congestion upon which the effusion depends, but it tends to abate the undue action of the heart; in other cases, however, blood-letting would be very in jurious, from its enfectbing the patient; and as it frequently occurs from weakness, or living on poor or unwholesome food, the treatment must consist of a generous diet, with tonics. In general, the object is to augment the discharge of watery fluid from one or more of the secreting surfaces of the body; and it is often a matter of great micety to determine by what surface or channel this ought to be attempted. In some cases it is best to seek to promote this discharge by way of the kidneys; in others, by the nucous lining of the alimentary canal; in others, by the external skin. Sometimes great present relief is afforded to the patient by tapping; but it is generally only temporary, and can only sometimes be resorted to.

DROSEALORM, GROSEALORM, GROSEAL

Druids

on the face, with one arm under the forchead, so that any fluids may flow from the throat and nuth, and without loss of time,—I. To exist everpication; 4. turn the patient on his side and, a, apply anuff or other rritant to the nostrills; b, dash cold water on the face, previously rubbed briskly until it is warm. If there he no success, again lose no time, but, II. To smilate respiration; 5. replaces the patient on his face (when the tongs will then fall forward, and leave the entrance into the windpipe free); then, 6. turn the body gently, but completely, on the side and a little beyond (when inspiration will occur), and then on the face, making gentle pressure along the back, when capiration will take place, alternately. These measures must be reseated deliberately, efficiently, and perseveringly, fifteen times in the minute only. Meanwhile, III. To induce circulation and warmth, continuing these measures, 7, rub the limbs upwards with firm pressure on the face, with one arm under the forehead, so that measures, 7. rub the limbs upwords with firm pressure and with energy, using handkerchiefs, &c., for towels; & replace the patient's wet clothing by such other covering as can be instantly procured, each bystander supplying a coat, waistcoat, &c. "These rules," says Dr. Hall, "are founded on physiology; and whilst they comprise all that can be done immediately for the patient, available all apparents galvasium the warm. patient, cricule all apparatus, galvanism, the warm bath, &c., as useless, not to say injurious, especially the last of these, and all loss of time in removal, &c., as fatal."

Dave, drug (Fr. drogue), a term applied to those substances used in medicine sold by the druggist and compounded by apothecaries according to the prescriptions of physicians and surgeons. The proand compounded by apothecaries according to the prescriptions of physicians and surgeons. The professions of the chemist and of the druggist are mixed together in a very confused manner. This uncertainty has been caused principally by the rules established by the medical corporations, such as the College of Physicians, the College of Surgeons, and the Apothecaries Company. Acids, alkalies, oxides, and salts, which are used in large quantities, are manufactured on an extended scale in several parts of Great Britain. The term of chemist and druggist is, however, smally ambied to those oproms who retail and undersmally manifed to those oproms who retail and undersmally manifed to those oproms who retail and underusually applied to those persons who retail and understand the ohemicals which they purchase from other parties who make them on a large scale. A book has been lately published by Dr. Normandy, under the title of "The Commercial Handbook of Chemical Analysis:" of "The Commercial Handbook of Chemical Analysis: " this work is intended to afford aid in the detection of fraud in the manufacture of food, drugs, and chemicals. The subject upon which it treats is of especial importance to provincial druggists. The different substances are alphabetically arranged. The following remarks show the usefulness of such a work:—"Country druggists form a class of persons to whom this work would be very serviceable; for although there are, of course, highly creditable exceptions, particularly in great provincial towns, the bulk of whom are not distinguished for chemical, or even pharmaceutical knowledge. Few are expable of conducting an analysis or organic research, and they are frequently imposed upon by wholesale dealers, who send them damaged or spurious wholesale dealers, who send them damaged or spurious drugs, which, if administered in dangerous maladies, might induce agravation of disease, and very probably cause death." In 1558 a new medical act was passed, by which the new general council formed to carry out the provisions of the act is empowered "to cause to be published, under their direction, a book containing a list of medicines and compounds, and the manuer of preparing them, with the true weights and measures by which they are to be prepared and mixed, and conby which they are to be prepared and mines, and con-taining such other matters and things relating thereto as the general council shall think fit, to be called British Pharmacopoia; and the general council shall cause to be attered, amended, and republished such Pharmacopens as often as they shall feel necessary." In mercantile language, any commodity that lies on hand, or is not saleable, is called a drug.

nand, or is not sateable, is called a drug.

Drugger, drug-get (Fr.), a sort of cloth, of a coarse, flimey woollen texture, generally used for covering carpets, but in some parts of Great Britain used as an article of clething by families among the poorer classes.

Usually, it consists of a mixture of woollen and cotton, and in Scotland the insterial called drugget has generally the warp of a coarse flax, and is commonly striped blue and white.

Druggers / See Crawers and Theorems.

DECOGIST. (See CHEMIST AND DEUGGIST, PHAR-

MACRUTICAL SOCIETY OF GREAT BRITAIN, and UNITED SOCIETY OF CHEMISTS AND DEUGGISTS.)

DEUIDS, dru'-idz, a name given to the order of priests Drine, dru'-idz, name given to the order of priests which existed in ancient times among certain branches of the Celtic race, if not among all. Numerous derivations have been given of the name; but the most probable seems to be from the old Celtic word derouyd, from de, 'god,' and rouyd, 'speaking,' a participle of the verb rouyddim, 'to speak.' Various writers have endeavoured to establish a connection between the Druids and some of the other early heathen sects. Druids and some of the other early heathen sects. Some argue that the Druidical and Persian religious were identical; others regard them as connected with the Hindoos, others with the Egyptians, and so on. They only become known in history about the 1st century before Christ, and they were then chiefly found in Gaul and Britain. Julius Cæsar is the ancient author who has given the clearest and most minute account of them. According to him, they formed one of the two orders of rank and dignity in Gaul. They were engaged in things sacred, conducting the public and the private sacrifices, and interpreting all matters of religion. They were held in great honour an matters of reignon. They were head in great among the people, and a number of young men resorted to them for the purpose of instruction. They determined almost all controversies, public and private; decreed rewards and punishments; and if any one did not submit to their decision, they interdicted him from the sacrifices, which, among them, was the most heavy punishment, such persons being abunned by all, and deprived of all civil rights and privileges. Among the Druids there was one who possessed surreme authority Druids there was one who possessed supreme authority over them, who was either elected by the sullrages of over them, who was either elected by the sulfrages of the others, or, if pre-eminent in dignity among the rest, was at once elected. They assemble at a fixed period of the year, in a consecrated place in the terri-tories of the Carnutes, which is reckoned the central region of the whole of Gaul; and hither all who have region of the whole of crait; and influer all who have disputes assemble from every part, and submit to their decrees and determinations. They do not go to war or pay tribute like the rest, being exempted from military service, and having a dispensation in all matters. They are said to learn by heart a great number of verses; for they regard it unlawful to commit these to writing; and hence some remain in training for twenty years. In almost all other matters in their public and private transactions, they use Greek characters. Ones of their leading tenets is, "that souls do not become extinct, but pass after death from one body to another; and they think that men, by this tenet, are in a great degree excited to valour, the fear of death being dis-regarded. They likewise discuss and impart to the youth many things respecting the stars and their mo-tion; respecting the extent of the world and of our earth; respecting the nature of things; respecting the power and the majorty of the immortal gods. This institution is supposed to have come from Britain; and even now those who desire to gain a more accurate even now those who desire to gain a more accurate knowledge of that system, generally proceed thither for the purpose of studying it." As to the amount of knowledge possessed by the Druids, we have little means of determining. They unquestionably, however, possessed some knowledge of the beavenly bodies beyond what simply pertained to the regulation of their religious festivals, inasmuch as they computed the year by lunations, which supposes an acquairtance also with the solar year; and various relics have been found in Ireland, among Druidioal remains, which are thought to land, among Druidical remains, which are thought to be astronomical instruments designed to show the phases of the moon. At the same time, there was not a little of astrology, divination, and magic mixed np with their purer science. In their dootrine of medicine particularly, there was far more of superstition than of knowledge. To a great many plants they attributed a sacred mystic character. The oak was especially regarded as sacred among them, and in the out-groves they frequently performed their rites, deriving, according to some their name from the oak. Most cording to some, their name from the oak. cording to some, their name from the oak. Most sacred of all, however, was the mistletoes, which they esteemed so an antidote to all poisons, a cure for all diseases. It was gathered at certain seasons, with the most formal and pompous ceremonies. According to Pliny, as soon as it was discovered upon the oak, the Druds collected in crowds about the tree; a priest in white vestments ascended, and, with a knife of gold,

Dry-rot

out the mistletoe, which was received by another standing on the ground; sacrifices were offered up, and the day spent in rejoicings. These were certain other plants which were regarded as potent remedies for various diseases, and were servied about as charms, as well as amber beads, which the Druids manufactified for warriors in battle, and which are still found in their tombs. A still more powerful taliuman was, according to Pliny, the serpents egg. It was formed, he says, by the poisonous spittle of a great many serpents twined together. It was gathered at moonlight, and afterwards worn in the bosom. Their profounder seremonies, those which they celebrated in the depths of the oak forests or of scolladed caves, are known to us only through the vaguest traditions, and in the stupendous but displated stone mountents which still exist in some parts of France and Britain. It is said pendous but dispidisted stone monuments which still exist in some parts of France and Britain. It is said that human sacrifices were frequently offered up upon their slars. They consisted of three distinct classes,—the bards, the vates or prophets, and the priests proper. The bards were poets, not only of a religious, but also of a martial and satirical class. The vates were the diviners or revealers of the future, who were charged with the conduct of sacrifices and other exchanged with the conduct of sacrifices and other external ceremonies, and who stood as mediators or interpreters between the people and the higher order of priests. These dwelt in the depths of the oak forests, of priests. These dwelt in the depths of the oak forests, cultivating the more secret and mystic doctriner of their faith. They exercised judicial functions, and were resorted to in great numbers by the youth for instruction. When Gaul was subdued by the Romans, the Druidical religion gradually retired before the classic heathenism, and, step by step, withdrew at first into Armorica, and then into Great Britain, where, in the time of Nero, it was attacked and mostly suppressed. It lingered as a public worship longest in the sland of Anglesca, whence it was finally driven out by the Roman troops, amid a great deal of alaughter. Nevertheless it continued, as a superstitious belief, to hold sway for many years thereafter over the minds of the Celtic tribes and their descendants.

Datus, draw (Du. trom, troomed, Ger. troomed, Dan. fremme), a musical instrument of percussion, supposed to be of Oriental invention, and said to have been introduced into Western Europe by either the

been introduced into Western Europe by either the Moors or the Arabians. Of drums we have three kinds they are as follows:—1. The base or Turkish drum, which is the largest, and consists of a hollow cylinder of oak covered at each end with vellum fastened to the rim in such a manner that it may be tightened or loosened ad libitum by means of small cords or brace loosened at libitum by means of small cords or braces exted upon by sliding knots of leather. 2. The double or kettle drum.— An instrument made of copper, nearly hemispherical, covered with a strong head of calf-skin, and standing upon three iron legs. They are always in pairs, and are tuned by screws,—one to the keysote of the piece accompanied, and the other a fourth below. 3. The side-drum.—This is constructed like the first, but generally has a breas cylinder, and is much smaller. Within the last six years great improvements have been made in the manufacture of side-drums by Messrs. Mey, Rudall, and Co., Charing-cross, London; and, since 1858, our infantry have side-drums by Mesers. Key, Rudall, and Co., Charing-cross, London; and, since 1858, our infantry have been supplied with these drums by the above-mentioned makers. They weigh three pounds less than the old fines, are much smaller, of a superior tone, and tuned by screws instead of the old straps and ropes. There has also been a drum of this kind invented without a cylinder, resembling two tambourines joined at a short distance apart by small bars of iron, with their concavi-ties facing each other.

Danwellan Cours-Mastal, the name given to a

ties facing each other.

DEUM-HEAD COURS-MASSTAL, the name given to a conneil of officers convoked in haste when on active service, to punish or pass sentence of death on any soldier who has committed an offence which requires to be dealt with in a summary manner. The big drum was used as a table, round which the officers composing the council assembled; whence the name, which is now applied to any court-martial held in haste.

Deut-Major, the principal drummer in a regiment, who beats the big drum, and teaches and has the general misagement of the other drummers. He also receives orders from the officer in command respecting the drummers, and the beats to be given at any appointed time.

DRUMMER, drum 'mer, any man or boy in a regiment who bests the drum, and in this manner gives various signals to the troops. (See Braz or DRUM.) Signals are given to light infantry by bugiers instead of drummers. The drummer has to perform the unpleasant duty of flogging any soldier who may be ordered to receive a certain number of lashes as a pumishment. The drummers stand immediately before the privates on the musterwich. on the muster roll.

On the muster-rus.

Drummer, a species of coackroach found in the West Indies, and so named from its habit of keeping up a continual knocking noise during the night. They are said to attack people when salesep; and this is probable correct since they have been seen to pray on the

minute in proportion to its wonderful brilliancy.

DRUTACEE. (See ANYGDALEE.)

DRUTA, drop (Lat. drupe), in Bot., a superior onecelled, one or two seeded, indehiscent fruit, having a
fleshy or pulpy sarcocarp (middle layer), and a hard
or bony endocarp (inner layer). The perioarp, or
complete envelope of tha seed, is separable into its
component parts,—namely, epicarp (orternal layer),
sarcocarp, and endocarp. The drupe is commonly
called a stone-fruit. Examples occur in the peach,
apricot, plum, and cherry. The trut of the almond presents all the characters of a drupe, except that the sarcocarp is of a toughish nature, instead of being

sarcocarp is of a toughish nature, instead of being succulent. A number of drupes aggregated together on a common receptacle, as in the raspberry, form collectively a kind of eterio (which see).

DRYING OILS, dri-ing oils (Sax. dri, dry).—Oils are divided into drying and non-drying oils, according as they become solid or remain liquid by the absorption of the oxygen of the air. The principal drying oils are linseed, walnut, poppy, hemp, cod-liver, and aperm. Those belonging to the latter class are olive, almond, rape, colra, and many animal oils. The uses of the former for paint, and of the latter for illuminating purposes, are instances of their opposite properties being taken advantage of.

Dry-form, in Eng., a sharp, fine-pointed etching-

DNY-POINT, in Eng., a sharp, fine-pointed etching-needle, used to cut fine lines in a copper or steel plate without biting them in with soid. Work produced in this manner is very delicate as well as durable.

whout biting them in with said. Work produced in this manner is very delicate as well as durable.

DRY-ROY, the name given to the decay of timber, proceeding from the fermentation of sap that is left in the wood, and which is brought about by the influence of warmth, combined with a certain degree of moisture and the want of proper ventilation. It appears in timber that has not been properly eassoned, or which has been cut in the spring of the year, when the sap is rising, as in the case of oak-trees, which are cut at this time for the sake of the bark. When the sap has fermented, the vegetation of fungi follows, which spreads through the wood, destroying the fibres to such an extent that they crumble into dust under any slight pressure. To prevent dry-rot in timber, it is necessary that it should be well seasoned, and that the air should at all times have free access to it. Various methods have been adopted for filling the pores of the wood with some solution, to reader it proof against destruction by dry-rot, among which may be mentioned Sir William Burnett's process, by which the wood is seaked in a solution of chloride of sino, and that of Kyan, by which the pores of the timber are filled with a solution of heloride of sino, and that of Kyan, by which the pores of the timber are filled with a solution of heloride of sino, and that of Kyan, by which the pores of the timber are filled with a solution of heloride of sino, and that of Kyan, by which the pores of the timber are filled with a solution of heloride of sino, and that of Kyan, by which the pores of the sino page of the sino page and the sino page and the sino of the chloride of mercury, forced into them by the sir-pump.

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## Dryobalanops

DEFERENCIANCES AND ASSESSED ASSESSED AS AS In 1851 a royal commission was appointed to inquire into the state, discipline, studies, and revenues, of the nniversity; and in consequence of their report, various alterations were effected in the statutes. In the alterations were effected in the statutes. In the charter of feundation the queen nominated one provost, three fellows, and three scholars, in the name of the statute of t more, to constitute, with their successors, for ever, a body corporate and politic. The number of the cor-poration has been increased from time to time, and at present consists of a provost, seven senior and twentyseven junior fellows, and seventy scholars. The pro-vost and senior fellows form the board of management, and power is given to them to alter, amend, or repeal all laws, rules, or by-laws, to make new laws and rules from time to time; such new laws or alterations, however, not to have force or be binding upon the university until approved of by the senate or congregation. ever, not to have force or be binding upon the university until approved of by the senate or congregation. The senate consists of the chancellor, or, in his absence, of the vice-chancellor or pro-vice-chancellor for the time being, and unch doctors or masters as shall are and keep their names on the books of the college. The caput of the senate is a council, consisting of the chancellor or vice-chancellor, the provest (or, in his absence, the vice-provest), and the senior master non-regent, who is elected by the senate. Every green cover, more especially those of the preceding year. Terms may be kept in two ways.—by attendance upon mences with an examination of the studies previously one over, more especially those of the preceding year. Terms may be kept in two ways.—by attendance upon the lectures or by merely passing the term commences are passing the term commences and the senior and number of the caput has the caput before it can be proposed to the respictive voice. The provest, or head of the college, is appointed by the Crown, and must be in boly orders, and a solution of the senior, and therefore an elegative voice. The provest, or head of the college, is appointed by the Crown, and must be in boly orders, and a solution of the caput in the city; law, engineering, and medicine, however, are continued by the Crown, and must be in boly orders, and attend lectures are promoted from the juniors in the order of saniority. The examination comprises mathematics, mentals, inserted and morel sciences, physics, classics, the leftway are promoted from the juniors in the order of saniority. The examination comprises mathematics and experimental and experimental, classically an experimental and experimental, classically an experimental and experimental.

# Dublin University

benefices at the disposal of the college. The law binding them to calibery was abolished in 1286. They must be members of the English dearch, and are all bound to enter into pricate orders except five a madisus, two jurists juris civilie, and two jurists juris anglish. The average annual moons of a serior follow from various acuroes is naually from £1,200 to £1,500; of a invitor follow membrals from this past of the from various sources is usually from \$1,300 to \$1,560; of a junior foliow, principally from thition, about \$300. The income of the provest is about \$2,560 per annum. The scholars are chosen from among the undergraduates fatter examination; one close of scholarships being fog classical, another for scientific merit. Scholarships are open to all students being or becoming mambers of the established church, and age tenable until the holder is entitled to the degree of thatter of arts. Nichelarships their commonstrate of streams arts. Nichelarships their commonstrate of streams and meaniers of the established cancer, and are venante until the holder is entitled to the degree of thester of arts. Scholarshave their commonsfree of expense, and their rooms for half the charge paid by other students; they pay half-feet, but are exempted from college charges or decrements, and receive from the college charges or decrements, and receive from the college charges or decrements, and receive from the college charges are also non-foundation scholarships, founded in 1854, open non-foundation scholarships, founded in 1854, open to students of all religious denominations. Their emoluments and tenure of office are the same as those of the other scholars; but, as their name imports, they are not members of the corporation, and do not enjoy the univarsity franchise. There are four grades of students:—1. Noblemen, sons of noblemen, and baronets, who enjoy certain privileges, the two first being entitled to the degree of B.A. per speciales grations; 2. fellow-commoners, who have the privilege of dining at the fellows' table, and who are entitled to the degree of B.A. with one term exemination less than pensioners; 3, pensioners, who form the great body of the students; 4 sizars, who are students of limited means, and have their commons free of expense, and are exand have their commons free of expense, and are ex-empted from annual fees. Sizars are admitted annually by examination, and the number is limited to thirty. Each rank has a dress peculiar to itself. The mode admission into the university is by an examination held once in every month (except February, August, and September); those in July, October, and November being public, the rest private. The subjects of exam-ination embrace Latin and English composition, arithmetic, algebra (the first four rules and fractiona), English history, modern geography, and two Greek and Latin books. Besides the honour of "firstplace" at entrance, prize of the value of Me and E2 are awarded for excellence in special branches of the entrance course, and ske for Hebrew. Each student at entrance must select one of the innior fellows who act as tutors to be his instructor and guardian of his interests during his academic carear. Undergraduates of the first and second year are junior and senior freshmen; of the third and fourth, junior and senior resamen; of the third and fourth, junior and senior sophiators. The course for all students is.—first year, mathematics, Greek, Latin; second, mathematics, logic, and metaphysics, Greek, Latin; third, logic and metaphysics, physics (mathematical and experimental), classics. An extended course is prescribed for those

#### Drong

26. St., the sizers being exempt. These do not include recess and commons. To encourage meritorious sindents, and to make some provision for those who, after graduation, desire to devote themselves to learning, fourteen studentships were standed by royal statute in 1859. These are open to candidates of all siligious denominations, and are temable for a period not exceeding seven years. The manay, as fixed by the provent and senior fellows, is not to exceed \$100 per annum. A school of engineering was established in the university in 1853, with the view of combining the theoretical and practical instruction necessary for the processes a very complete staff of professors, who represent negaty all branches of summa knowledge. The total number of students on the college books, under the degree of M.A., was in the year 1871 as follows:—Scholars of the house, 69; non-foundation scholars, 10; fellow-commoners, 37; pensioners, 1,132; sizars and ex-sizary, the M.E. Dub. University Calendar, 1871.

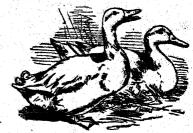
Dygar, bub-ut (last ducates, duchy), a gold coin very much used throughout the currency of Europe. It derives its mane from the legend found on the first pieces of the kind, which were coined in Sicily during the 12th century. The legend runs: \$11 tiel; Christe, dates, quem tu regis, Duactes, ! Let that duchy

during the 12th ventury. The legend runs: Sit fibi, Christs, datus, quem tu regis, Duactus, 'Let that duchy be thine, O Christ, which thou rulest.' After the 12th ventury the issue of ducats increased largely in Italy: Venetian ducats were called Lecchini, from Leoca, where they were coined. In 1509, Germany adopted the ducat into the consequence of the ducate into the consequence. where they were coined. In 1859, Germany adopted the ducat into the currency, and shortly afterwards its use spread over the whole of the north of Europe. The ducat varies in quality and weight. The ordinary ducat, which is current in Russia, Austria, Hamburg, &c., weighs 54 grains troy, and has a value of 9s. 4d, sterling. Many German states no longer issue ducats. The Italian ducat is of less value than the translational that Versiting ducat heirs, which that mentioned, the Venetian ducat being valued at the sterling. The Spanish ducat is called ducado, but is generally called a dollar: its value in English money is 4s. 2d., and it is made of silver.

DUCES TROUM, du'-seez te'-kum (Lat., you will bring with you), in Law, is a writ commanding one to appear at a certain day in the court of Chancery and to bring with him some evidences or other things which the court would view. A party in any cause or matter depending in the court of Chancery may by subpona ducing focus require the attendance of any winces before the examiner, and is entitled to the production of any deed, paper, or writing in his possession, custody, or power. If the court, however, does not think it probable that the documents will be evidence

#### Duck

and even now our fen counties are patronised by them in anoh wast numbers as to been the London market fully supplied in the season. The extreme wastiness of these birds renders necessary much patience and ingenity in obtaining large quantities of them. They fly at a considerable height in the six, in the shape of a wedge or triengle, before they slight on any spot, they take several wheels in the air, as though to reconnecte, and then descend with extreme precusion. When at rest on the water, they take bare to been at a considerable distance from the afters, and when they compose themselves for eleep, some of the company are always awake to keep guard, and to imprise the compose themselves for elemp, some of the company are always swake to keep guard, and to apprise the remainder of the approach of danger. They are much more active by night than by day. The wild duck usually makes her next amongst the tail grass or rushes skirting the water; but instances have occurred of the birds building in trees. "In Susser, the nest of a mallard was found in an oak-tree five and-twenty



AYLESBURY DUCKS.

feet from the ground; the old bird was sitting upon nine eggs supported on some small twigs laid crosswise. In Derbyshire a gerileman's gamekeeper observed a wild duck fly out of a large oak in which the year previous had been a hawk s nest. On examination she was found to have completely repaired the old nest she was found to have completely repaired the old nest and to have high therein two eggs. Another instance occurred at Madely, in Staffordaire. In this case the wild duck took possession of a fook's nest near the top of an oak. The drake was also seen to perch on a bough near her, and occasionally in her absence to sit in the nest."—(Staniey's History of Birds.) The food of the duck consists of worms, molluses, and aquatic insects, which they separate from the mud by the agency of lamelles at the margins of the bill. Inspeaking of the malliard as the type of the timeduck, Mr. Tarrell observes, concerning their leading characteristics — Externally they exhibit considerable length of neak; the wings are also long, reaching to the end of the tail; the tarsi somewhat round; the hind toe free, or having no pondent lobe. In habits they may be stated generally as frequenting fresh water, but passing much of their time on land, feeding in ditches and about the shallow edges of pools, on aquatic plants. think it probable that the documents will be evidence between the parties, the court will not compet the comments of a third party to be produced.

DUGHA HERF. (See MECHANDARME).

DUGHA, dutables (Fr. dutable), a term applied to the courtery or dominious of a duke; as the dutably of Langaster. The court of the duciny of Langaster in Externally they exhibit considerable length of the results which the name of dutk is generally extended is characterized by greater breasth of bill then either which the name of dutk is generally extended is characterized by greater breasth of bill then either the whilst that of both swans and getes is in frest part vegetable. A well-known brimple of this family is the wild duck, or common maliard (Lang Berkell), the conjunction of all the countries of Europe, but abounds especially in the northern parts. It is heavy two feet in length, three feet in extent of wings, and weights about three pounds. The bill is of a greenish yellow colour; the head and upper part of the neck of a closey green, terminated in the middle of the neck by a white colour. The scapings for white colour; the best is brown, and the rump black, shaded with green. The lower part of the neck of a white colour. The scapings for white solder. The isometract of marsh hand in the proper places. The common status of the neck by a white older. The scapings for white colours the best in extent of an extent of an extent of the neck by a white colour. The scapings for white colours; the best pared with fine brown lines; the best is brown, and the rump black, shaded with green. The lower part of the neck by a white colour. The scapings for white colours; the best pared with fine brown lines; the best in extent of the scale in all of them is of hone of the duck is the scaping of the fine of the problem of the fine of the problem of the fine of the duck is a colour of the marsh and proad themselves over the insurance of the specific parts.

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#### Duck

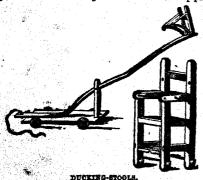
with one mate, but takes the control of an entire troop of hems. Whatever its species may be, the tame duck is a desirable bird to have in a poultry-yeard. Nor is water indispensable to its existence; "so far from it, instead of being absolutely necessary, it is often injurious to the young; in fact, they should never be allowed to swim till more than a month old. Instead of allowing young ducks to go out in the morning to est slugs and worms, they should be kept up, since this food, notwithstanding their partiality for it, is injurious."—(Stanley.) They lay a great number of eggs, require very little attention, and, with respect to ducklings, they may be easily fattened in the course of a month with any kind of pulse, or grain and water. (See Dacor.)

O's Boots, with any aim of pune, or grain and excellent (See Dacot.)

Duck (from Swedish duk, a cloth), a sort of plain heavy linen, highly glazed, and of coarse texture. It is much used for making the smock frocks worn by the agricultural labourers in England, and also for the many different in course and iron

roogh shirts worn by workmen in copper and iron smelting-works and forges.

DUCKELLA, ORNITHOERINGUES, or PLATTPUS, dubi-dilys gen. of mammalis, ord. Monotremata. Only one species is fully ascertained (O. paradosus, or pasatious), generally known as the water-mole in the Australian colonies. The active length of the suited including generally known as colonies. The entire length of the snimal, including bill and tail, is about two feet; body long and compressed, and thickly covered with very glossy hair, at the roots of which is a layer of waterproof felt-like material. The head is round and small, eyes small and bright, no external ear, and instead of the muzzle, mouth, and teeth of an ordinary quadruped, the creature is furnished with a bill like that of a duck (but have after it proportion), and possessing small transverse broader in proportion), and possessing small transverse lamine like the duck's bill. The legs are short; the fore feet have each five toes, with strong burrowing claws and a connecting membrane for swimming. The hind feet are likewise webbed, but the web does not extend beyond the base of the claws. The tail is strong, extend beyond the base of the claws. The tail is strong, broad, and flattened, about half as long as the body, covered with longer and coareer hairs, and nearly naked on its under surface. It lives chiefly in the water, and, like the duck, seeks its food among the mud. Its burrowing powers are said to exceed those of any other animal, fifty feet being no very uncommon length for it to run. It is wary and active, and by no means easily shot. Its voice resembles that of a young puppy. DUCKING-STOOL, dak'-ing stool (Ang.-Sax.), an apparatus of varied form, used formerly in Britain for punishing scolding wives. One of the most ordinary forms of the ducking-stool was the following:—A strong wooden chair was fastened to the end of a long beam, which worked like a see-saw on a pivot, on a post bedded into the edge of a dam or the deep part



The woman was placed in the chair with of a river. The woman was placed in the chair with her arms drawn backwards; a bar was placed across her back and inside her elbows, while another bar held her opright; in this uncomfortable position she was securely tied with cords. The persons appointed to carry out the punishment, by raising their end of the beam, caused the unfortunate outprit to go over head in the water. By pushing down their end 708

## Duelling

with a chain, she was once more brought to the surface; and the ducking was repeated, according to the enormity of her offence. Sometimes the ducking stool was combined with a tumbrel. A ducking stool of this description was in use at Leominster up to the year 1809; the beam was 23 feet in length. The practice of using the ducking-stool commenced in the 15th century, but had almost died out by the close of the 18th. The cucking-stool, often confounded with the descript stool was different tunishment; it the ducking stool, was a different punishment; it was used unreservedly for men and women, who were fixed in a stool at their own doors, to be pelted and hooted

at by the mob.

Ducr, dukt (Lat. duco, I lead or conduct), denotes generally any tube or canal by which a fluid is conducted or conveyed. It is more particularly used in Auat. to denote the vessels which convey the fluids in

animal bodies.

DUCT, in Bot. (See VESSEL.)

DUCT, in Bot. (See VESSEL.)
DUCT, ALIMENTARY. (See ALIMENTARY CANAL.)
DUCT, ALIMENTARY. (See ALIMENTARY CANAL.)
DUCTLITY, duk-till-e-fe (Lat. ductible, from duco, I lead, draw), the power possessed by certain bodies, and especially the metals, in virtue of which they are capable of being drawn out in length, while their diameter is diminished, without fracture or separation. Among the metals it may be called the property of being able to be drawn out into wires. The order of the metals which are ductile is almost similar to the order of those which are malleable; it is as follows:—Gold, silver, platinum, iron, copper, zino, tin, lead, nickel, palladium, cadmium. Platinum wire has been produced only acont of the indiameter. Glass produced only 1000pth of an inch in diameter. Glass is exceedingly ductile at a high temperature. The property is also possessed by other substances; such as gums, glues, resins, &c., when softened by moisture or heat.

DUELTING, du'-el·ling (Lat. duellum, Fr. duel), a combat between two persons, at a time and place specified in a challenge sent by one of the parties to the other. Duels usually arise out of private quarrels, and the general practice is for the party insulted to send a friend to demand an apology. If he refuses, he is requested to name his friend; and the two friends, is requested to name his friend; and the two friends, or seconds as they are called, arrange the preliminaries for the combat. They also choose the ground, regulate the mode of fighting, place the weapons in the combatants' hands, and enforce compliance with the rules which they have decided upon. Although the duel is now of very rare occurrence, it is comparatively a modern institution. is comparatively a modern institution. Among the ancient Greeks and Romans no such practice existed, and the word duellum meant a war between the ancient offers and homes in such passes, existed, and the word duellum meant a war between two nations. Afterwards, under the belief that God would interfere miraculously in behalf of the innocent against the guilty, judicial disputes were decided throughout Europe by trial by battle. (See Battle, or Battle.) Probably the duel originated in a belief in the same principle. It seems to have had its origin among the Germanic nations. Louis le Débonnaire was the first French king whe permitted disputants to resort to arms. Henry II. prohibited duelling, on account of a combat between his friend Francis de la Chastaignerie and Guy Chabot de Jarnac, in which the latter was slain. The practice of duelling, however, still continued. Francis I openly encouraged it, and set an example by challenging Charles V. Several ineffectual attempts were made to put down the practice; but to such an extent was it encouraged it, and set an example by challenging Charles V. Several ineffectual attempts were made to put down the practice; but to such an extent was it carried on during the sovereignty of Henry IV., that in the first eighteen years of his reign 4,000 gentlemen lost their lives in duels. Henry was compelled by popular feeling to endeavour to abolish the outsom by adding death, in extreme cases, to the penalties then in force. He, however, did not look with an unfavourable eye upon duelling; somequently, although very unlawful, it became very fashionable. During the reign of Louis XIII duelling became so prevalent that it was said in Paris that no Frenchman was worth looking at unless he had killed his man. Although duelling was so common, the law against it was carried out with great rigour, sud several noblemen and gentlemen of high renown were bebeaded for pernisting in fighting. During Louis XIV's reign, duels of three, four, and five a side were common; but the king at last enforced the laws with such firmness that, for the time, duelling

was almost abolished. Duelling appears to have been introduced into England about the time of the Norman conquest; but it was principally in its public or judicial form. Private duelling was very prevalent in the reign of Queen Elizabeth. It declined public or judicial form. Private dueting was very prevalent in the reign of Queen Elisabeth. It declined during the Commonwealth, but broke out again in the reign of Charles II. During the reign of William III. attempts were made to abolish duelling; and in 1712 - till was introduced into parliament, but 1712 a bill was introduced into parliament, but was thrown out, notwithstanding that its objects was thrown out, notwithstanding that its objects had been strongly advocated in Queen Anne's speech. After the wearing of swords was abandoned, dueling diminished for a time; but the pistol soon began to take the place of that weapon. After a time, chance took the place of skill, and ghastly, albeit absurd, duels were fought at two or three paces, one pistol being loaded and the other not. This sort of duelling seemed to reach its climar when the disputants made choice by lot between two pills, one made of bread and the other containing poison. From the woint duelling declined, and has quite fallen into made of bread and the other containing possible. From this point duelling declined, and has quite fallen into disrepute; in this country, indeed, it may be said to be abolished. By the laws of England, any man killing another in a duel, however fair it may have been, is sonsidered guilty of murder. Whilst it was not looked about marourably by the public, no jury could be found who would convict any one charged; but the case would probably be different at the present day. The duels among the German students were merely fencing-matches with sharp weapons; and although some ugly cuts in the face were given and received. they were never absolutely dangerous, as armed seconds were always on the alert to prevent any serious wounds. Several stringent additions on the subject of duelling were added to the Articles of War in this country in 1844 by the commander of the forces. Partly through these, but more particularly through the increasing improvement of English society, duel-

ling has ceased to be an institution of this country.

DUENNA du-en'-nā (Span. dueña), the title applied to the chief lady in waiting upon the queen of Spain. In a more restricted sense, the termed is used to designate a person holding a middle position between and companion, and appointed to take charge of those young ladies who are members of Spanish or Portuguese families.

DUET, du-et' (Ital. duetto), in Mus., a two-part com-position, either vocal or instrumental, with or without a bass and accompaniments. To form a good duet, the execution should be pretty equally distributed between the two parts; the melodies so connected, intermingled, and dependent on each other, as to be entirely inseparable, but at the same time perfectly related and concinnous when heard together. Although combined by the situation of the harmony, the parts are not necessarily similar in their motion; on the contrary, it is by varying and giving them contrary directions, that the best effects are produced.

Dugono, du'-gong (Halicore Dugong), a marine animal belonging to the herbivorous cetaces. In general form it much resembles the manates. Its length varies from twelve to twenty feet. It feeds on length varies from tweive to twenty rest. It leeds on the alga which grow on submarine rocks in shallow seas. Its affection for its young is remarkable; and if the latter can be surprised and captured, the mother may be easily taken. Its flesh is caten, and said to resemble coarse beef in texture and flavour. It is found among the islands of the Indian archipelago. Rüppell asserts that it was with the skin of the dugong that the Israelites were ordered to veil the tabernacle.

Israelites were ordered to veil the tabernacle.

DUGUERIA, du-gu-e'-sk-d, in Bot., a gen. of plants belonging to the nat. ord. dnonaces. The only interesting species is D. quitarensis, a native of Guiana, which furnishes the atrong elastic wood called lancewood. This is chiefly use by coach-makers.

DUER, dute (Lat. due, a leader, a general; Fr. duc, Ital. duca), an honorary title given in England to noblemen of the highest rank. The term is first used in history in Gen. XIXVI. 15, with reference to the grandsons of Esan, and probably signifies their position as the heads or founders of families or tribes, as it that early period. It wasseapplied as an especial title of rank to the military governors of provinces of the Roman empire about the year 325, in the reign of 709

Constantine the Great, when they ceased to exercise the civil functions which had hitherto formed a part of the duties of the Roman guretnors or proountators. There were from thirty to forty of these duces or dakes, ten of whom were partimistry disfinguished by the appellation of comes, or companion, in allusion to the closer relationship into which they were brought to the emperor, by virtue of the high dignity with which they had been invested. The title comes in late ages became "count," and then implied a rank subordinate to that of duke, although it had previously been superior to it. (See Court.) The early Roman counts and dukes were distinguished by wearing a golden baldrick or band, and they received considerable emoluments from the state, to enable them to support their dignity in a becoming manner. Their to support their dignity in a becoming manner. Their to support their dignity in a becoming manner. Their power was entirely restricted to their military command, other officers being appointed to collect the revenues and administer justice. The title of duke was preserved in snoceeding ages, and for the most part applied to military commanders of high rank, by the northern tribes, who asserted their supremacy over the south of Europe in the latter days of the Roman empire. At the time of the conquest it was account of the conquest it was a triant to restrain the super shearth and linkly given to persons exercising almost absolute and kingly power over large tracts of territory called dukedoms, acknowledging the superiority of the monarch, of whom they were supposed to hold their lands by fendal tenure, by some slight and cocasional act of homage. (See Faunt Swarzak). It was, however, no uncommon thing for the duke to enter the lists with his feudal lord on very slight grounds of offence, and successfully hold his own against him. Such were the dukes of Normandy, Gascony, Aquitaine, and Bur-gundy. Their dominions and titles were hereditary in all cases. The title is applied even in the present day to the soversigns of many notity German States long. to the sovereigns of many petry German states, sometimes with the prefix of "grand" or "arch;" as the grand-duke of Baden, the duke of Brunswick, &c. In our own country the Norman and Plantagenet kinga assumed the title by virtue of their continental possessions accurated by interience on marriage. Into it was sions, acquired by inheritance or marriage; but it was-first conferred as an honorary distinction by Edward III. on his son, Edward the Black Prince, whom he created duke of Cornwall in 1335; since which time the title has always belonged to the prince of Wales for title has always belonged to the prince of Wales for the time being, by prescriptive right. For some time after this the title was strictly confined to princes of the blood royal, or to those who were very nearly allied to the royal family; but shout 1450 the dignity was extended to the Staffords, Beauchamps, and other families, besides those who could claim close kindred with the sovereign. The majority of Roglish dukedoms were conferred in the reigns of William III. and Mary, Anne, and George I; but since the death of that monarch comparatively few instances here occurred of the creation of a dukedom, that of Wellington, created in 1814, being most worthy of notice, and curred of the creation of a dukedom, that of Wellington, created in 1814, being most worthy of notice, and most honourably earned. There are at present twenty-eight dukes of the United Kingdom, the duke of Cambridge, a duke of the blood royal, being excepted, of whom twenty are English, seven Scotch, and one, the duke of Leinster, Irish. The duke of Norfolk is the premier or senior duke of England, by priority of creation; and the duke of Hamilton, the premier duke of Rogland. duke of Scotland.

DUES OF EXERTE'S DAUGHREE, an instrument of torture resembling the rack in construction. It is said to have been invented during the reign of Henry VI., by the dukes of Exeter and Sussex. According to Blackstone, it was never put into use. It was at one time exhibited along with other instruments of torture in the Tower of London.

in the Tower of London.

Duke of York's School, the name commonly given to the Royal Military Asylum at Chelseaf established by the duke of York (who, by this and other sots, earned the sppellation of the "soldier's friend") at the commencement of the present century, for the orphan children of soldiers. The expenses of the institution are met by a public grant made for the purpose, which always forms a part of the annual army estimates. The boys are admitted as vacanies happen to occur, and are chosen by the board of management from the numerous applicants who are candidates for the benefits of the charity. On quitting

#### Dukumara

the explain the boys generally enter the erroy; but if they do not wish to do so, they are apprenticed to some trade. There was also a subsol for the orphan daughters of suddiers at Cheises; but this has long since been given up, owing to the missional destroisme of those who had been educated there. It appears, however, to be unjust that the should excited the daughters of suddiers who have deal in the saction of their soundry from participating in the advantages provided by the state for their some.

Dynamana. Also hereafter h

Depositions, deliverment (feel, delemello, from delement), a manifest instrument, most probably of the wind-species, used amongst the moient Hebrows. Its enter form is unknown.

BULSE. (See BEODOMENTA.)

FULSE. (See BEODOMENTA.)

Towners. du/-ij, was founded at Dul DULMING COLLEGE, Sul'-ij, was founded at Dul-wick, a suburb of London, about 41 miles S.S.E. of St. Faul's, by Edward Alleyn, an actor, in 1612. The pregnate revenues only amounted to £300, but they now exceed £12,000, and maintain a master, four fellows, exceed 222,000, and maintain a master, story lenows, six poor six poor sixters, twelve poor scholars, and thirty out-members. The building was recently regained and much improved, under the superintendence of the late Sir C. Barry. It has a picture-gallery containing some fine paintings, chiefly by the old masters, and sequesthed to the college by Sir F. Burgeois,

DUMB. (See DEAR AND DUMB.)



DUMB-BELLS, duran'. bells, two weights, generally made in the form represented in the en-graving, used for pur-poses of exercise. They are made of various weights, varying from about 8lb. to 28 lb. The centre bar, which is often covered with leather, is grasped in the hand.

DUNCTAD, TEB, dun'-sho-dd, a satire originally written in three books, by Alexander Pope, in 1728; he, howperiod Pope had suffered from the attacks of a number of critics and detractors, who not only denied his genies, but attributed to him the basest and meanest of motives. Unable to bear these attacks any longer estimathy, and stong to the quick, he determined to attribe out in every direction at his antagonists, and the Dimeniad was the method by which he achieved his said. Oritics, authors, publishers, at hoc genus comme, winsed and howled as the stinging lash of his satire fell it light and left among them, and wherever it fell it leave blood. He recriminated, and chartised in teres epigerum and not over-debeste sairs, every one by whom he thought he had been aggrieved, and immortalised his autagonists as he demolished them. Even now, although all the dramatic persons are passed away from period Pope had suffered from the attacks of a number although all the dramatic persons are passed away from the mene, the Dunciad can still be read with interest as a model of polished verse and keen pungent sature.

Dumms, or Downson verse and seen pungest satirs.
Dumms, or Downson, dunce (Cett, duns, h. hill, whence Fridmes, Ger. dunes, Du. duynen), the name given to low and simust bereven hills of sand of great breadth, that extend along the coast of Holand, Belgium; and the northwar departments of France, and serve to protect northern departments of France, and serve to protect the factile land within them from the insade of the coses. They have been formed by the wind blowing great questities at and inland whenever it set dear and a day after its askinding on an extensive a subcess. A few kinds of grass, such as the Carea are shown. A few kinds of grass, such as the Carea are shown. A few kinds of grass, such as the Carea are shown. A few kinds of grass, such as the Carea are shown as the context, the Festivas rubra or creeping feature-grass, and the Arundo arenaria or sea-reed, grow on kieses sand-bunks, and are of material benefit in bindingsine loose surface together. These sand bunks, and series of Brittany and inhority she institution of the price, and since that time there have only beaugable claim. In bindingsine loose surface together. These sand files in the state of the filtch. The last two-awada-wine made in discount and since that time there have only beaugable claim. These denses for figure in they are called dense. These denses for figure in they are called dense. These denses for figure in the context of the same string to the filtch. The last two-awada-wine made in loose of figure in the context of the same string to the filtch. The last two-awada-wine made in last years to persect the found on the coarts of Brittany and cohers, have endeavoured of last years to persect the found on the coarts of Brittany and others, have endeavoured of last years to persect the found of the same string the coarts of Brittany and others, have endeavoured of last years to persect the found of the same string the coarts of Brittany and the same string the coarts of Brittany and others, have endeavoured of last years to persect the found of the same string the coarts of Brittany and the same string the coarts of Brittany and others, have endeavoured of last years to persect the found of the same string the coarts of Brittany and the same string the coarts of Brittany and others, have endeavoured of last years to persect the found of the same string the coarts of the same string the coart

### Duodecimal Scale

Surrey; and the North and South Downs, in Kent and

DUNG-REFILE, duny-by-fi (Ang-Seat), the most of certain of the Scarabuides, living, for the most spart on or in the dung of other sminals; They see seion on or in the dung of other animals. They are solventifically known as Coprophagi (Gr., dung bestie). For the most part they are black, or black and brown, and some few are adorned with brillians anshills coloure. To this section belongs the secret bestle of the Egyptians, the Scewaless ascer of Linnesse: it is about an inch long, and of a black colour. This species is not only found in Egypt, but is met with in the south of Spain, France, and Itsly, and, as well as other species of the group to which it belongs, incloses its eggs in a ball of extrement, which it forms by rolling the substance by means of its hind-legs. The size of the ball, when completed, is much larger than the insect, being sometimes as much as an inch and a half in diameter. sometimes as much as an inch and a half in diameter. The dor, or shard-born beetle (Geotraper sterogramiae), helongs to this tribe, and is one of the commonest of British beetles. It is of a stout form; less than an inch long; black, with metallic and blue reflexions on the undersurface. This species may often be heard droning through the air of a summer evening. We is almost impossible to ever-estimate the great-good per-formed by these insects. Not only do they hatten the removal from the ground of what becomes more offensive the longer it stays, but they carry the offensive matter to where plants grow, and, by distributing it in the soil, materially seniet their proper growth. Dusgator. (See Donion.)

DUNGEON. (See DONJON.)
DUNGERS, TUNEERS, GREMAN BAPTISTS, OF BRETSBEN, a religious sect of Baptists that originated in
Germany in the early past of the 18th century, about
twenty families of which left their native country, and settled in Pennsylvania, U.S., about 1719. They were speedily followed by others, and at length formed themselves into a distinct sect, and, in 1733, essablished a kind of monastic society at a place called Kphrata. The members adopted the dress of the White Friars, The members adopted the dress of the Winte Frans, and received monastic names, though they did not take any monastic vows. They hold the fundamental doctrines of Christianity, and acknowledge the Scriptures as the only infallible rule for faith and practice. They are chiefly remarkable for their rigid adherence to the precepts and ordinances of the New Testament, and do not admit of any innovations whatever on the established forms and ceremonies of Christ, even to the washing of the feet before recoving was continued. Their chief peculiarities are with regard to baptism and the sabbath. They hold to adult baptism, and administer the ordinauce by triple immersion; and they observe the seventh day as the sabbath. They washing of the feet before receiving the sacrament. they observe the seventh day as the sabbath. they observe the seventh day as the sabbath. They are exceedingly simple and peaceful in their manners, disclaiming viclence even in cases of self-defence, and suffering themselves to be defrauded and wronged rather than go to law. They consider future happiness only to be obtained by penance and outward mortification in this life, and deny the eternity of future punishment. This sect still exists in scattered bodies, wited in homosplane. chiefly in Pennsylvania.

DUNEOU PLIYOR, dun-see, a singular custom insti-tuted at Dunmow, in the county of Essex, in 1246, by Robert de Fitzwaiter. Its shjeet was the bestowal of a prise on a man and wife who had lived without quar-relling, on the following conditions:—"That whatever married couple will go to the priory, and, danseling on two hard pointed stones, will swear that they have not quarrelled nor repented of their marriage within a year and a day after its safetnation, shall smeare a fitch of bacon." The first prise was not assumed till two hundred years after the institution of the prise, and since that time there have only been subtle claim-ints for the fitch. The last two awards were made in 1855 and 1860. Mr. Harrison attenues the movelist, and others, have endeavoused of late years to per-petuate the custom. DUNNOW FLITCH, dun-mo', a singular custom insti-

### Duodecimo

example, suppose it were required to secertain the superficial contents of a piece of timber 12 feet 92 inches long and 3 feet 92 inches in width. In order to calculate this by the duodenimal scale, one dimension must be put under the other, the feet being piaced under the feet and the inches under the inches. The half-inch is expressed in lines, 6 lines going to the half-inch, 13 lines to a full inch :—

In this calculation, feet are considered as units of me sure, and inches are so many twelfths of unity. The units thus form the first place in the column, the twelfths the second, and the one hundred and forty-fourths the third. When the first line is multiplied fourths the third. When the first line is multiplied by 3 feets or 3 units, the result is 38 feet, \( \frac{1}{2} \) of a foot, and \( \frac{1}{16} \) of a foot. When the upper line is multiplied by \( \frac{1}{16} \) of a foot. When the upper line is multiplied by the six lines are made equal to \( \frac{1}{16} \). The first indeed to the other make \( \frac{1}{12} \) or \( \frac{1}{12} \) and \( \frac{1}{12} \). The dided to the other make \( \frac{1}{12} \) or \( \frac{1}{12} \) and \( \frac{1}{12} \). The ultimate result is as above, if a service forward. The ultimate result is as above, if a square feet and 120\( \frac{1}{2} \) square inches. To practical men the operation described is much simpler than the explanation, and beginners have great difficulty in meatering it. The dandecimal scale is not generally inserted in ordinary books of practical arithmetic. nary books of practical srithmetic.

DEODECINO, du-o-der-e-mo (Lat. duodecim, twelve), a term applied to a book when every sheet is folded six times, so as to make twelve leaves, or twenty-four pages. Is is usually abbreviated into 12mo.

DUODERUM, du-o-de'-num (Lat. duodesus, consisting

of twelve), in Anat., is the name given to the first por-tion of the small intestine, and was so called by the ancients because it was supposed not to exceed the breadth of twelve fingers; but as they dissected only animals, this does not hold true in the human subject. animals, this does not note true in the numan subject. It is from eight to nine inches in length, and commences at the pyloris end of the stomach. It first inclines upwards, backwards, and to the right, and, having arrived near the neck of the gall-bladder, it bends vertically downwards, and again changes to a transverse direction; thus forming two curves or angles. It is in this intestine that chylification of the food takes

It is in this intestime that chylification of the food takes place. (See Drouszion.)
Divelocation of the Cube, du-ple-kei'-shan (Lat. duplice, I double), a celebrated problem of ancient geometry, by which it was required to construct a cube whose solid contents should be double the contents of a given cube. The origin of this problem is as follows: During the occurrence of a plague at Athens, a deputation was sent to the oracle of Apolto at Delos, to learn what would stop or mitigate the catastrophe. The answer received was, that the plague would not cesse until they had doubled the size of the altar of the God. The shape of the altar was cubical, and the problem was, consequently, to find the side of another cube of twine the solid contents of the altar. This problem sould not be solved by plane geometry, as it cube of twice the solid contents of the altar. This problem sould not be solved by plane geometry, as it required the solution of a cubic equation. Hippocrates of Chica, however, by the insertion of two mean proportionals between two straight lines, resolved it into another and simpler problem. Several of the anoisnt geometers, including Archimedes, Eutocins, Esppus, and Misomades, discovered various methods of solving this problem by means of the higher curves. Newton and Huygens, among other celebrated modern mathematiciane, also gave much attention to the subject of the Duplication of the Cube.

Duba Marke. (See Brain)

ject of the Duplication of the Cabe.
DUBA MARRA. (See BRAIN.)
DUBANERS, de-rol-mes (from Lat. derse, herd), in
Bot., the heart-wood or central portion of an exogenous stem. It is made up of wood-cells with thickened
sides, and which are impermeable to fluids, hard in
texture, coloured, and of a dry nature. (See ALBURNUE.)

# Durham University

DUBANTE, du-faile (Lat.), is a term completed in certain law phrases in the sense of during; as, duminal beas-placife, during pleasure; deresse vitt, during life. Durants minor state (during minority) if its ing-ilite. Jurants among another the minority of an infact executor, or the infant next of kin: durante attenties, an administration granted when the executor is out of the realing to continue in force until his returns. DURANS. deresse (Nor.), literally present hardship:

the realm, to continue in force until his retirra.

Durres, de-ress' (Nor.), literally means hardship; and hence, constraint of liberty. In Law, duress is of two kinds:—L. Duress of imprisonment, which is imprisonment or restraint of personal liberty; and 3. duress per minac (by mennaca or threats), cerviou imposed by fear of loss of life or limb. It is a general principle in law, that a contract made under compulsions not binding, and many acts will be excused on this ground which would otherwise be blameable; but the evil to be dreaded must be in some proportion to that which is commutated. A man some proportion to that which is commutated. some proportion to that which is committed. A man would not be excused for homicide to avoid even a considerable injury to himself. But in regard to civil transactions, a smaller degree of restraint will be a transactions, a smaller degree of restraint will be a sufficient ground for avoiding an obligation. Duress of imprisonment includes confinement of the person in any wise. The keeping of a man against his will in a private house, putting him in the street, is an imprisonment. If a man is under duress of imprisonment, and he seals a bond or the like, he may allege this duress and avoid the extorted bond. But if a man be lawfully imprisoned, and to procure his liberty, or on any other fair account, seals a bond or a deed, this is not duress of imprisonment, and he is not at liberty to avoid it. It is doubtful whether, in this country, mere duress of goods, as where the signature to an agreement dures of goods, as where the signature to an agreement was procured by a threat of detention of a person's goods or of injury to them, would suffice to avoid a contract; but in America this is held to be the case.

Contract; Dat: A America that is ent to be the case.

Duehan University, due-dm, dates its origin only,
from 1832, when a bill was introduced into parliament
to enable the dean and chapter of that see to appropriate an estate at South Shields for the establishment
and maintenance of a university for the advancement of
learning in connection with the said cathedral church. and maintenance of a university for the advancement of learning in connection with the said cathedral church, the late Bishop Van Middert engaging to provide even-tually for the warden, the professor of divinity, and the professor of Greek, by attaching prebendal stalls to the several offices. Under the authority of this act, the university was opened in 1833, and in 1835 a status was passed by the dean and chapter, and approved by the bidne intracting the ordinary management of the was passed by the dean and chapter, and approved by the bishop, intrusting the ordinary management of the university, under the bishop as visitor, and the dean and chapter as governors, to the warden, a senate, and a convocation. After a constitution and the studies had been satisfactorily arranged, a royal charter was had been satisfactorily arranged, a royal charter was granted under the great seal on the lat of June, 1837, incorporating the persons therein described by the name of "the warden, masters, and scholars of the university of Durham;" and granting them "all the rights and privileges which are assumed to the univer-sity by the act of parliament, or incident to a univer-sity established by royal charter." It consequently possesses the right of granting degrees. By an order-of her Majesty in council in 1841, it was provided that the office of warden should in future be permanently annexed to the desnery of Durham; a cassonry in the supered to the desnery of Durham; a caronry in the cathedral church was amound to each of the profesoathedral church was americal to each of the professor sorships of divinity and Greek; the professor of mathematics was appointed professor of mathematics and astronomy, with an increased sulary. It was also provided that a professorship of Hebrew and the other Oriental languages should be founded; and, in addition to the six fellowships which had been established by the dean and chapter, expiteen others were to be founded. Certain additional estates were assemed to the proving for this nurrough. A collect to be founded. Certain additional entaies were assigned to the university for this purpose. A college
was formed within the university, and building fitted
up for the reception of students, and censors and tutors appointed to watch over their conduct and direce
their studies. These accommodations were subsequently much enlarged, especially by the addition of
Durham Castle and its precinets. A new hall, called
"Histop Hatfield's Hall," was opened in 1986, said
unlarged by an additional building in 1989. Another
hall, called "Bishop Cosin's Hall," was opened in 1986.

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## Durham University

In 1837 the benefits of the university were extended by the establishment of a course for students in vivil engineering and mining; and in 1852 additional facilities were given for students in medicine. Various alterations have since been made in the university, the last of which are by the ordinances of the university commissioners, but of the soft and administration of the university. In terms of these ordinances the bishop of Durham is to be the visitor of the university, and the dean of Durham the warden,—the latter exercising a general superintendence over the university, and convening the senate and convocation. The senate is to consist of the warden, professors, and tutors, and to manage the prodes, professors, and tutors, and to manage the pro-perty, maintain the discipline, direct the studies and examinations, and transact the business of the univeratty. The convocation is to consist of the wardens, professors, and tutors, and such persons as shall have proceeded to the second degree in the university; and will have power to confirm or reject what is submitted to it by the senate, but will have no power to originate or amend. The visitor has the appointment of the professors, to whose professorships canonics are annexed, and the senate will appoint all the other professors and all the store. There will be one professor of mathematics and astronomy; and in the school of physical science there will be at least three professors; namely, of chemistry and metallurgy, of geology and mineralogy, and of mining and machinery. To those professorahips not connected with canonics a fixed salary of £300 per annum will be annexed, and the tutors are each to have a salary of £250. Students will be of two kinds,—matriculated, whose names are placed on the register of the university, and non-matriculated,—such as have the permission of a professor to attend his lectures without his name being on the register. The matriculated student must reside elsewhere; and previous to matriculation he must state to what school he proposes to belong, and pass an elementary examinawill have power to confirm or reject what is submitted to it by the senate, but will have no power to originate proposes to belong, and pass an elementary examina-tion adapted to the studies of such school. The degrees are granted in three separate schools; viz.—1. Arts, classics, and mathematics; 2. theology; 3. physical science. No matriculated student is required to keep more than four terms in order to proceed to the degree of backelor in any of the three schools; and a graduate in any one of the three schools may, after an interval of three years, if he keep his name on the register of the university, proceed to the second degree in the same The matriculation fee will be £2, and the fee for tuition (each term) £5. Students resident in the college, or in any hall or house belonging to the university, must further make in advance the following pay-ments:—25 each term for rent, including furniture, and 21.5s. each week for battels, including service, and £1. 5s. each week for battels, including service, lighting, fuel, and all other domestic charges, except washing. A fee of 10s. is likewise payable each term to the university for keeping his name on the register. The fee for the first degree in any one of the times exhools is £2; for the second, £4. Forty open scholarships of £30 a year, each tenable for two years, are to be established, open to all persons, whether members of the university or not; but no member of the university shall be entitled to compete who shall have been a member lowest than one morth. These the university shall be entitled to compete who shall have been a member longer than one month. There are also to be forty scholarships of £50 a year each, open to all students commencing their second year, and tenable for one year; but, on the student graduing, in one school and becoming a student in some other, may be held for a second year. The scholarships are to be distributed between the three schools in proortion to the number of students at each respectively, portion to the number of students at each respectively, excepting that not more than one-third in number and value of them shall be held at any one time by the scholars in this school of physical science. There are also certain periests exholarshing, varying from £20 to £10. 10s. each, also tenable for two years, to be given to such persons as have most distinguished themselves in the examination for the university scholarships of £30 a year, and who are students in the school of arts. There are other private scholarships of from £25 to £10 s year each, given to such students of theology as have most distinguished themselves in the examination for the 200 scholarships.—Ref. Durkaw Univ. Oct.

## Dutch Liquid

DURIAM. (See DURIO.)
DURIO, du're-o (from Malay dury, thorny), in Bot., a gen. of plants belonging to the nat. ord. Steventiaces. The species D. sibethinus yields the fruit called the durian, which is highly esteemed in the southeastern parts of Asia, being accounted next in value to the delicious mangasteen. (See GAROIMIA.) It has, however, a strong smell, which renders it disagreeable at first to those unaccustomed to it; but the dislike to this smell is essensible soon overcome.

this smell is generally soon overcome, DURRA. (See HOLOUS.) DURIA. (See HOLOUS.)
DURIA ARMOSPHERIC, dust.—When a ray of any light enters a partially-darkened apartment through any amall aperture or chink in the shutters, or when a flood of intensely-brilliant light from the same source pours into a room through Venetian blinds or other means taken to exclude it to a certain extent, we can distinctly see small particles of various substances, familiarly called motes, floating about in the track of the sunbeam, and moving with creater or less randity the sunbeam, and moving with greater or less rapidity according to the extent to which the air is agitated in which they are suspended. Under ordinary dircumstances, these motes, or atmospheric dust, are invisible to human sight, being so minute that they can only be seen under the conditions that have been mentioned, through the reflection of strong sunlight from their surface, or by the sid of a powerful microscope. But whether they are visible to us or not, they are always present in the atmosphere that we breathe; and it is considered that the lower strats of the air immediately in contact with and above the surface of the earth are constantly impregnated with these small particles, of unappreciable weight and size, that are fragments of various organic and inorganic substances that have been worn away from the bodies of which they origibeen worn away from the bodies of which they originally formed a part, by friction and other causes. Scientific meteorologists ascribe the suspension of these small particles to the internal friction of the air, the resisting power of which increases very rapidly in proportion to the diminution of the particles themselves; that is to say, that, supposing we have two very small particles, one being the 1,000th part of an inch in dismeter and the other the 10,000th part of an inch, the power of the air to sustain the latter would be a hundred times greater than it would be to keep up the hundred times greater than it would be to keep up the former, although the diameter of the smaller particle former, although the diameter of the smaller particle has only been diminished to the tenth part of the greater one; so that it follows that when particles of dust are of extremely minute size, they would be held suspended almost in a state of perfect rest, provided that the air itself were free from agitation from any exciting cause. In many parts of the world, was toollections of this attacepheric dust are frequently formed, from excess that they not higher these explained. from causes that have not hitherto been explained; and to such an extent that they assume the appearance of thick have and banks of clouds, from which the terms "dust haze" and "dust storm" are frequently applied to them. When in Teneriffe, one of the Canary I for the purpose of making astronomical observations, Professor Smyth found these clouds of dust to be con-Professor Smyth found these clouds of dust to be constantly present in the atmosphere, often affecting the transmission of light to a great extent, so as to obscure the rising and setting of the sun, and to render the observation of the stars by day quite impossible, be sides gathering round the summit of the Peak of Tensriffe in horizontal strata, and almost concealing portions of it from view. This atmospheric haze, occasioned by particles of dust, has been noticed in South Africa and on the Himalays Mountains. Professor Smyth considers the convergence of the phanomanous to Africa and on the Himalays Mountains. Professor Smyth considers the occurrence of the phenomenon to be general throughout the world, although not so palpable to observation as in the districts already named; but he confesses his inability to determine where the dust came from, or whither it went, as well as why it should collect together in such quantities in mountainous regions. It has been discovered by Professor Ehrenberg, of Berlin, that the particles carried about by the wind, when submitted to chemical tests, consist of minute fragments of all kinds of mineral substances, mixed with mould and various organic bodies.—Ref. English Cyclopadis—Arie and Sciences.

DUTCH LIQUID, data his hard, in Chem. C.H.Cl., C. C.H.Cl. HO. When oleflant gas is mixed over water with chlorine in equal proportions, oily drope of a heavy, sweetish, aromatic liquid condeuse and

## Dutch Metal

sink in the water. This product is called Dutch liquid from the circumstance of its having been discovered in Holland, and its oily appearance gives the name to oledant gas. It is a very interesting substance to chemists, having been extensively employed by Faraday and Regnault in the elucidation of the theory of substitution.

DUTCH METAL, met. 41, in Metal., an alloy of copper and sine beaten into thin leaves resembling gold-leaf, from which it is readily distinguished by dissolving in

oil of vitriol

oil of vitriol.

Duren Rushes. (See Equiserum.)

Duren, du'-te (Ang.-Nor. from dee), is literally something due or owing by one person to another; hence, that which a person is bound by any natural, moral, or legal obligation to pay, do, or perform. In Pol. Ec., it is a tax or impost levied by the government or the public revenue. It is but reasonable that each individual who is member of a state should contribute in some area to the support of that state, and that to values who is member of a state should contribute in some way to the support of that state; and that, to some extent, in proportion to the benefits he derives from it. The apportioning the expenses of a government among the different classes of a community, in auch a way as not to affect the material prosperity of the state or of individuals, is one of the most difficult branches of the arts government. It is defined. the state or of individuals, is one of the most difficult branches of the art of government. High duties give rise to smuggling, and diminish the consumption of the article on which they are laid; while low duties increase the number of articles necessary to be taxed, and thus materially augment the expense of collection. The following general rules are laid down by Adam Smith on this subject:—1. That the subjects of every state aught to concribints to read the support of the state ought to contribute towards the support of the government as nearly as possible in proportion to their respective abilities; 2. that the tax which each individual is bound to pay ought to be certain, and not arbitrary; 3. that every tax ought to be levied at the time, or in the manner, in which it is most likely to be convenient for the contributor to pay it; and 4, that every tax ought to be so contrived as both to take out, and to keap ut of the receive of the receiver of the rec and to keep out, of the pockets of the people as little

and to keep out, of the potential of the people as fitting as possible over and above what it brings into the public treasury of the state. (See TAXATION.)

DWARF, dwaurf (Sax. dwerg, dweorg), in general language, a term applied to those human beings who are less in height than the average of their specific V. In a more restricted sense the word dwarf is applied to those cases in which there is a uniform applied to those cases in which there is a uniform arrest of growth. Among the ancients there was a general belief not only in the existence of dwarfs of great minuteness, but also in the existence of nations composed exclusively of them. In the works of Aristotle there is an account, which he declares he had from trustworthy sources, of a race of diminutive men and diminutive animals, living in the caves on the banks of the Nile. Their habits and customs, together with their recoverablest positions are also described. with their geographical positions, are also described by Pliny. The accounts of these pigmy people read very like Gulliver's accounts of the Lilliputians. Phi-letas, a poet, who was contemporary with Hippocrates, if all accounts are to be believed, was one of the smallest men that over lived. He was obliged to load himself with ballast in order that he might not be nimself with ballast in order that he might not be blown away by the wind. Nicephorus Calistus men-tions an Egyptian dwarf who "did not exceed a par-tridge in size" at the age of twenty-five. The most remarkable case of all, however, is that mentioned by Atheneus, of Aristatus, a poet, who was so small that he was invisible to the naked eye. Among the legends of the Scandinavians, the dwarfs occupy a conspicuous place. They are crafty, cunning elves, skilled in magic and in the working of metals. In Ethnology they are supposed to have been originally a race of oriental Lappe, who settled in Sweden and Norway after the Finns. In the mythology of the time they were looked upon as the connecting links between organic and inorganic nature. Giants were looked upon

## Dyeing

change ores into metals; and it was also believed that they took charge of the development of seeds and fruits. From these ideas probably arose the widely-apread and still existing belief in fairies and other diminutiva and still existing belief in fairtes and other diminutars beings, supposed to be favourably disposed towards certain members of the human race. These old tradi-tions, which belonged to western Europe, were broken through by the teaching and literature of the monks. All the strange legends and stories which had formerly been associated with dwarfs were transferred to the been associated with dwarfs were transferred to the saints. Nevertheless, among the rural population of all the nations in the west of Europe there is a strong belief in the existence of the diminuive beings whom Shakspere has so deliciously portrayed in "Midnummer Night's Dream." In Great Britain there are still a large number of persons who have a belief in the "faires" of England, the "brownies" of Scotland, and the "good people" of Ireland. Among the most remarkable dwarfs, properly so called, of modern times may be mentioned Sir Geoffrey Hudson, immortalized in Sir Walter Scott's "Peveril of the Peak." He was only eighteen inches in height at the age of thirty. After that age he rapidly grew to the height of three feet nine inches, and died at the age of thirty. He had and hands were enormous, but otherwise he was well proportioned. Another extraordinary dwarf was Court Joseph Borowiaski. At the age of them the set of the set of the was well proportioned, another in height, and at the age of thirty, three feet three inches. He was well proportioned, and married a woman of average size. He had several children of the ordinary size, and died at the extraordinary age, for a dwarf, of ninety-eight, in the county of Duram, in the west 1837. Wickless Extra commons. devil and his attendant spirits, and in some cases to for a dwarf, of ninety-eight, in the county of Dur-ham, in the year 1837. Nicholas Ferry, commonly known as Bebé, was another singular dwarf. His parents and relations were well-proportioned people: he himself war a seven months' child, and at his birth weighed less than a pound, and was not eight inches in length. He died at the age of twesty-three, not being more than three feet high. There is a wax model of him in the Museum of the Faculté de Médecine at Paris. At his death his bones were found to be com-pletely ossified; and from the disappearance of the cranial sutures, his skull fully resembled that of an aged man. In the present day, one of the most re-markable dwarfs is Charles Stratton, usually known as General Tom Thumb. He was exhibited in this comtry about twelve years ago. At that time his height was twenty-five inches, and his weight twenty-five pounds. It is a singular fact in relation to dwarfs, that although the growth and physical development arrested, in most cases the nervous system is fully developed.

DYRING, di'-ing (Sax. deagan, to dye), in Manuf.— Dyeing may be defined as the act of tinging or colouring absorbent materials by impregnating them with solu-tions of colouring matters. Colouring matters which effect this without the intervention of a third substance, or mordant, are called substantive colours, while those or morast, are cancularious account which require such aid are called adjective. The exact way in which dye stuffs act upon fibrous materials has not yet been investigated as fully as it deserves; the generally received opinion is that the fibre has an affinity generally received opinion is that the fibre has an affinity for the colouring matter in the case of substantive dyes, and for the mordant, which in its turn has an affinity for the colouring matter of adjective dyes. Another opinion is, that the fibres contain pores which absorb the dye, forming an insoluble lake in the case of mor, danted dyes. However this may be, it is certain that different materials take dyes in different proportions. Thus silk and wool take the coal-tar dyes in the most perfect manner, but cotton requires the intervention of a powerful unieral or animal mordant. The operations that take place in dveing are, mordanting, ageor a powerful unineral or animal mordant. The opera-tions that take place in dveing are, mordanting, age-ing, dunging, dyeing, and clearing. The principal mordants used are alumina, extensively employed for woollens and silks in the form of alum and cream of textar, peroxide of iron, which is much used in the form of protacetate for logwood and madder. Fer-oxide of tin and several other metallic oxides are used for the same nurnose. also albumen, caseline, and other ganic and inorganic nature. Giants were looked upon as the embodiment of the grander and more conspicuous forces of nature (see Giarts), while dwarfs represented the subcrdinate, but still incomprehensible, from the belief that dwarfs were more inclined to assist ordinary-mortals than to further the ends of the giants, they began to be looked upon as animal subctances in different forms. After the fabric beings well disposed towards man: they were supposed to sppear at strange moments, instructing him how to through which a current of stam and air is passing, by

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means of which the union between the fibre and the mordant is guidened very considerably. The cloth is then dunged, in order to remove the impedituous mordant not absorbed by the fibre. This was formerly effected by passing the fibric fibrough a mixture of cow-dung and water; but this filthy operation has been superseded in a great measure by the introduction of what are turned dang substitutes. The principal dung substitutes in use at present are the arsenite, are interested in the at present are the amendation of acquaints oots. The action of these is chemical; whereas that of the cowodung was supposed to be merely mechanical, by supplying the unabsorbed mordant with a librous material in a firm state of division. Dunging is one of the most important processes in the dyeing proper, which is effected by runging of the fibric through the solution of the dyestuff, the colour being modified, more or less, by the nature of the mordant used. It would be impossible in a short space to give an account of the different methods adopted affected colours; but a description of the means used to produce the more common colours will be interesting to the reader. Hiscks are generally produced by logwood or salls with an iron mordant. means of which the union between the fibre and the mordant is guickened very considerably. The cloth is means used to protuse the more common colours will be interesting to the reader. Blacks are generally produced by logwood or galls, with an iron mordant. Common black silks are dyed with logwood and fustic, fron being seed as a mordant. The best silks are dyed black on a blue ground. Woollen goods are first dyed black on a blue ground. Woollen goods are first dyed blue with indigo, and afterwards with sumac, logwood, and green copperss or sulphate of copper. Cotton and linen goods are dyed black in a very similar manner. Chromate of notash is also sometimes used with log-Obsomate of potash is also sometimes used with logwood; but practical dyers say that it possesses no great wood; but practical dyers say that it possesses no great advantages over blue or green copperas. Blues are produced from indigo, either in the form of sulphate or in aqueous solution. Pruesian blue, with a persait of iron or tin as a mordant, gives a very splendid dark blue; and, of late, several blues of novel shades have been produced from coal-tar. Reds are obtained by using cochineal, safflower, lac-dye, madder, or log-wood, with a tin mordant. Fine orimaon parples are obtained from coal-tar, and are known under the wood, with a tin mordant. Fine orinson purples are obtained from coal-tar, and are known under the popular name of magenta. The most important yellow dyes are queretirou, fustic, turmeric, arnotto, and French or Fersian berries. By cembining these different colours, and by adapting the mordants, colours of every concelvable shade and hue are casily obtained. When the fabric has received the colour intended, it is washed in a solution of soap to which a little alkali has been added, after which it is holled in water with as washed in a solution of soap to which a little sixal shas been added, after which it is boiled in water with or without the addition of solution of tin or other brightening substance. It is then said to be fast, which means that it will not be washed out. The chemistry of dysing has of late years attracted the attention of our greatest chemists, and has reached such perfection that a loose colour is almost unknown. The matter has received the most minute investigation at the hands has received the most minute investigation at the hands of such men as Hofmann, Stenhouse, Schunck, Rochleder, Persoz, and a host of others, who have not only benefited the art of dycing by their researches, but have also discovered new facts leading to new theories of chemical philosophy. The last great discovery made in this direction is that of the coal-tar dyes, a discovery that will eventually make us the dye-producing matter of Europe. nation of Eurepe.

DIR-STUPPS. (See Colouring Matters.) BYING DECLARATION. (See DECLARATION, DYING,

and Evipence.)
Dink, dike (Du. dyk), an embankment of earth, sometimes revetted with missonry, or secured with a sleping front of stonework to prevent the water of the ocean or any river from overflowing the low lands that have been drained and brought into cultivation. that have been drained and brought into cultivation. The most remarkable works of this kind are in Holland, some of which have been thrown up along the banks of the Rhice; as well as other parts of the country, for the protection of the pasture-lands. These dyles are very broad at the base, and slope gradually towards the top, along which reads, and sometimes sanals, are constructed, that serve to curry off the vater from the meadows, which is lifted to the level of the canal by pumping. The dyles along the Heider is six miles in length. The French call these structures levels, and the lowlands on either side of the Mississippi, near New Orleans, are protected from inundation by those embankments. The communication of dykes is an important part of the scheme for effecting the drainage of any tract of marsh land.

Or any tract or meran and.

DEER, in Gool, a term applied to any wall-like mass
of igneous rock filling up a fissure in other rocks. A
dyke may come up through any kind of previouslyexisting rock, whether igneous or aqueous. When the
matter of the dyke is harder than the intersected strata, snattee to one questionance tune me inversed arrea-and these have been subjected to waste and denuis-tion, the igneous wall-like mass may be traced for mile across a country; and on the other hand, where the rock-matter of the dyler has been softer, its course may also be traced by marrow wall-sided discurse and linear dividuality decreasions. A member of a second and may also be traced by narrow wall-aded assures seal linear ditch-like depressions. A wonderful example of a trap-dyke is the one so well known in the north of England as the Cockield Fell dyke, a nearly vertical wall of trap 18 or 20 yards thick, which runs in nearly a straight line from north-west to south-west for a distance of these traces of these traces of the straight line from north-west to south-west for a distance of the straight line from the straight line s a straight line from north-west to south-west for a dis-tance of about seventy miles, enthing through all be rocks from the coal-measures into the lower colites, Its igneous origin is proved by the baked appearance of the rocks in its neighbourhood. This coal in sp-proaching the dyke begins to be affested at a distance of fifty yards; it first loses the calcareous spar which lines its joints and faces, and begins to look drill, grows teader and abort, and also loses its quality for burn-ing. As it comes nearer it segment the appearance of ing. As it comes nearer it assumes the appearance of a half-burnt einder, and approaching still mearer it becomes converted into a real cinder. Immediately in contact with the dyke it forms a black substance, re-

sembling compressed soot. The seem of coal is ori-ginally from air to eight feet thick; but in approach-ing the dyke it gets thinner and thinner, being ulti-mately reduced to nine inches.—Ref. Jukes's Manual of Geology.

DYNAMICS, di-num'-iks (Gr. dunumis, power), that division of mathematics which treats of force, considered as producing motion in bodies. Force may be defined as any cause which changes, or tends to change, a body's state of rest or motion. The case of force a body's state of rest or motion. The case of force tending to move bodies from rost will be found under the subject of STATICS. The case of force actually producing motion, or changing motion, belongs to Dy-namics. Some of the most distinguished philosophers have given much time and labour to the investigation of this branch of mathematics. Among these may be mentioned Newton, Huygens, Euler, D'Alembert, Poinsot, and others. The dootrine of dynamics is divided into several distinct heads. First, the names and definitions of the various terms employed; such as force, velocity, accumulating velocity, moving relocity, motion, accumulating motion, &c. The second branch of dynamics treats of the movement of points, and is divided into two classes of problems,—direct and inverse. In the first case the path of a point is determined when In the first case the path of a point is determined when the forces acting upon it are given; and in the second case the force or forces acting upon a point are deter-mined when the path of the point is given. In the third brauch of dynamics the motion of a rigid sys-tem of points or a solid body is treated of. D'Alembert first haid down the general method for treating problems in rigid dynamics. Motions of rotation are treated of in the fourth branch of dynamics. The three laws of motion upon which most of the problems in dynamics depend are as follows: First, a body under the action of no external force will remain at rest, or move uniformly in a straight line. Second, when any num-ber of forces act upon a body in motion, each produces its whole effect in altering the magnitude and direction

its whole effect in sitering the magnitude and direction of the body's velocity, as if it acted singly on the body at rest. Third, when pressure produces motion in a body, the momentum generated in a unit of time, supposing the pressure constant, or which would be generated supposing the pressure variable, is proportional to the pressure. (See CENTRAL FORCES, FORCE, PERCUSSION, PROGRETILES.)

DYSAKOMETER, di-númom'e-ter (Gr. dienamic, power, and metrosis, to measure), the name given to all instruments that are constructed for the purpose of measuring the power that can be exerted by the human frame, animals, or machifery, whether by a single effort of strength or by a continuous series of efforts exercised during any given time. In estimating the amount of work performed by any motive power by

#### Dysentery

means of a machine contrived for the purpose, we have to consider the force that has been applied and the space through which this force has been exerted. If a horse pull a fundaedweight along a mile of level ground in half as hour, or half a horderdweight over two miles in the same tune, he will have performed the same smouth of work in both cases; but if he continue to perform the same take for an hour in either case, it is manifest that he will have done double the quantity. We see, then, that the amount of work done must be estimated by the force applied to accomplish it and the space of time for which the application of the force is kept up; in other words, it will be measured by the force exerted multiplied by the space of time through which it continues to set. To ascertain this with accuracy, dynamometers are required. The simplest kinds of these instruments are those used to determine the force which any man or animal can exert by a single effort. They vary considerably is form, as the force happens to be applied to the machine by tension or pressure, or by strking it with the elsewhed first to determine the weight of the blow that a person can deliver. The amount of power exerted is indicated by a needle moving along an horizontal or circular scale. a needle moving along an horizontal or circular scale The best, perhaps, for ascertaining the strength of the human body, or that of an animal, is the dynamometer invented by Regnier, which consists of an elliptic spring of steel fitted with a hook at one end and handles and a graduated index at the other, with appliances to more the index needle to the proper extent when any force is applied to the machine. To test the strength of the body, the machine is fastened to the ground by the book at the lower end, which is inserted in a socket imbedded in a strong beam. The person festing his power than plants his feet firmly against the beam, and, grasping the handles at the other and, pulls them with the utmost strength he can exert. This causes which the unions strength he can call the the sides of the spring to be brought more closely together than before, and the result of the force exerted to accomplish this is registered on the index. The strength of the arms is tested by squeszing the sides of the springs together by pressing on them with both hands. To measure the power of animals, the machine is fastened to a stont post or tree, and the animal is attached by a bar and traces to the handles or a ring passed through them. It is, however, manifest that the value of a continuous force cannot be measured by such machines as these, unless it were uniform. This, however, is far from being the case, as the force ex-erted by animals, and machines as well, is continually varying; but the work done during a long space of time can be accurately measured by machines contrived for the purpose; among which Morin's dynamometer seems to deserve especial notice. This contrivance measures the work done by machines by the bending of a spring, which is acted on by the motive power, and managed so as to register the influence that this exerts upon it by the action of pencils that describe lines on a strip of paper, from which the amount of work effected can easily be calculated. The construction, however, of this machine, and all of a similar nature, is too compli-cated to be thoroughly comprehended without a long cause to be thoroughly comprehended without a long and minute description, accompanied by elaborate diagrams. Ample information on the subject will be found in the English Cyclopedia—Arts and Sciences; Nichol's Cyclopedia, of the Physical Sciences; Tomlinson's Cyclopedia of United Arts; and Ganot's Physics. DYMENTERY, distension of Cyclopedia of United Sciences, Tom diag.

with difficulty, and esteron, intestine), is a disease characterized by frequent mucous or bloody stools, attended with griping pains in the abdomen, straining, and tensames. It differs from distribus in that while in the latter the stools are facel, in this there is a retention of the natural faces, or they are expelled from time to time in amail hard separate lumps, termed suplate. Dyseatery consists essentially in inflamma-tion of the mucous mesobrane of the large intestines, and, in the acute form or stage of the disease, is atand, in the soute form or stage of the disease, is at-tended with fever. Dysestery is one of the peats of hot climates, and in all tropical countries, at certain seasons of the year, it is very prevalent and destructive. It is, however, among fleets and armise that this maindy most displays its deadly power; so that it has been termed the "spourge of armies and the most fatal of all their diseases." At one time it was very prevalent 715

## Dyspensie

in this country; but now it is not a very commo a very serious disorder here. The forms of this it and the circumstances under which it prevails are and the diretting and many speculations have been formed regarding it. It is now a primary, now a connectaine and now a symptomatic disease. It has been ascribed to exposure to wet and cold, to the use of numbries some food, to the agency of malaria, to contaging the most violent forms of this disease occur. in warm climates and in situations where the body is exposed to extreme alternations of heat and cold; a hence there is every reason to believe that these influcacce are largely concerned in its production. Its food or malarious poison would induce it as a primary disease; and the general opinion among medical men is that it is not contagious. Generally one of the earliest symptoms of dysentery is an uneasiness of the abdomen, soon amounting to pain of a griping cha-racter, particularly in the umbilical region, attended with an inclination to go to stool, and temporarily relieved by evacuation. As the disease becomes dewith an inclination to go to stool, and temporarily relieved by evacuation. As the disease becomes developed, the relief is but transient; the desires to go to stool is more frequent and importunate; the discharge is scanty, and what is voided is either alterative and the stool of the stool to come away, the expulsion of which would cure him, and is irresistibly impelled to strain violently to get rid of the irritation. In an advanced state the stools become greenish or black, and very footid; the bladder frequently sympathizes with the rectum, and nauses and vomiting sometimes eneue. The patient passes sleepless or dreamy and disturbed nights, and is lowspirited and desponding. In "stal ones the pulse becomes very small and rapid, the features sharpen, the surface grows cold, and death at length sets in. The duration of this disease is very various. In some cases it may prove fatal in a few days, or even hours; in others it may last for weeks or months. Two stages are recognized of this disease, —the inflammatory and that of ulceration. In the inflaminflammatory and that of ulceration. In the inflammatory form, when the fever is high and the pain intense, blood letting from the arm is generally recommended, and also the local abstraction of the blood by leeches or enpping. Dover's powder is also given as a sadorific, and prefuse sweating encouraged. Purgatives are to be employed with great caution. If the colon be distended with feculant matter which it cannot discharge, then the midded purgatives, such as castor oil, should be administered, and cantiously repeated until the whole of the irritating matter is removed. If on the contrary, there is no and cantiously repeated into the whole of the irritating matter is removed. If, on the contrary, there is no accumulation of feculent matter, the use of purgatives is to be avoided. After the inflammatory state has been reduced by blood-letting, and the accumulated fesces ejected by purgatives, the great object is to stothe the irritated membrane by opiates, and to strengthen the system by gentle tonics and a light nourishing diet. If the disease is not cut short by this reached the second stars and hecome method, but has reached the second stage and become chrouic, the most effectual remedies appear to be laxsurroute, the most executal remedies appear to be lax-sitives and opistes given alternately, and combined with such medicines as promote perspiration. The abdomen should be awathed in fiannel, and much benefit may be obtained from the employment of clysters, if there be not too much tensamus to admit of the introduction of the pipe. The food should be farinaceous and simple, and great care must be taken during conva-leasence to increme to return to improper diet, and any

simple, and great care must be taken during conva-leasence to prevent a return to improper diet, and any fresh exposure to cold.—Ref. Watson's Lectures on the Principles and Practice of Physic.
DESPENSIA, dis-pay-sed (Gr. duspepsia, from dus, had, and segle. I concort or digest), in Pathol, in a bad or difficult digestion. It is by means of dipestion that the food which is taken into the stomach is com-verted into nutritive matter for supplying the waste-that is constantly sping on in the system; hence anyvaried into nutritive matter for supplying the waste-that is constantly going on in the system; hence engi-thing that interferes with the due supply of nutritive matter materially affects the system, and may intro-duce a long series of ills. The complicated series of

operations by which digestion is carried on renders indigestion one of the most prevalent of the ills to which human flesh is subject,—it is the prevailing malady of civilized life. "We are, "say Dr. Watson, "more often consulted about the disorders that belong to eating and drinking than, perhaps, about any others; and I know of no medical topic concerning which there is aflost, both within and beyond the profession, so much ignorant dogmatism and quackery. Referring to that article for an account of the various operation that are carried on in digestion, and a derangement of any of which would produce indigestion, we shall here chiefly confine our attention to that which is the most chiefly confine our attention to that which is the most frequent cause of this disorder,—a faulty performance of the functions of the stomach. It is here, as is well known, that the principal change is effected in the food. Whonever food is taken into the stomach, there is in the natural state a secretion of gastric juice, which acts chemically upon it, and by which it is disolved or converted into chyme. While this process going on, it is facilitated by a sort of churning or evolving movement of the stomach, and at length it passes by degrees through the pyloric extremity of the stomach into the intestines. Dyspopsia, therefore, may be occasioned by a deficient supply of gastric juice, so that the food is not properly dissolved, or from a too torpid or too irritable condition of the muscular fibres of the stomach, in consequence of which the chyme is detained too long, or ejected soo muscular fibres of the stomach, in consequence of which the chyme is detained too long, or ejected too soon. A weak dyspeptic stomach acts very slowly, or not at all, on many kinds of food. They undergo spontaneous changes, promoted by the mere warmth and moisture of the stomach; gases are extricated, acids are formed, and, perhaps, the half-digested mass is at length expelled by vomiting, or it passes undissolved into the duodenum, and becomes a source of irritation and disturbance during the whole of its passage through the intestines. One of the most frequent signs of indigestion is a loss of appetite, no desire for food, or, perhaps, even an absolute repugnance and disgust at the very thought of eating. Sometimes the appetite is capricious and uncertain, or may times the appetite is capricious and uncertain, or may even be morbidly craving and ravenous. Sometimes nauses comes on immediately after the food is swallowed; and sometimes without any nauses, but after the lapse of some time, the food is ejected by vomiting. There is, also, usually an obscure feeling of uneasiness fulness, distension, and weight in the region of the stomach, occasionally amounting to pain, or even se-vere pain, with flatulence and eructation. Some per-sons suffer pain when the stomach is empty, others immediately after taking food, or the pain may not begin for two or three hours after a meal, and then continue for some hours. Sometimes the pain comes on at uncertain intervals in the most violent paroxysms, accompanied by a sensation of distension, much anxiety, and extreme restlessness. Costiveness is a very frequent concomitant of dyspepsia, but sometimes it is attended with diarrhosa. Among the innumerable dis-orders in more distant parts that are produced by orders in more distant parts that are produced by dyspepsis are palpitations of the heart, irregularities of the pulse, asthma, pain in the head, with the loss of mental energy, and some confusion of thought. One of the worst of the occasional concomitants of dyspepsis is that state of mind which is known as hypochondriasis. There is languor, listlessness, or want of resolution, with an apprehension of some great evil in the future. Such persons are particularly attentive to the state of their own health, and, from any unusual feeling, perhaps of the slightest kind, they apprehend great danger, or even death itself. Of the causes that induce dyspepsis, are indigestion, noxious or irritating substances taker into the stomach as food or drink, -such as tainted meat, decayed vegetables, unripe fruit, very soid matters, alcoholic liquors, &c.; and even wholesome food taken too frequently, or in too large a quantity, especially when its nature is very nutritious or in a very being highly seasoned. The abuse of fermented and spirituous liquors is one of the most frequent causes of dyspepsis; and the consumption of large quantities of

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close application to business, strong mental smotion, or exposure to a cold or moist stmosphere. In the treatment of dyspepsia it is to be borne in mind that it is not so much medicines that will semove the present discomfort that are required, as a discontinuance of those habits which have generated the discomfort. Hence one great and indispensable principle in the treatment of dyspepsia is that of restricting the quantity of food taken at any one time. The amount of the food introduced into the stomach should be kept within the limits of its capacities and powers. Another very important principle is, that the stomach should have time to perform one task before another is imposed upon it. Mr. Abernethy always advised his patients to interpose at least six hours between one meal and another. From three to five hours ought to be allowed for the digestion of a meal, and one hour more for the stomach to rest in. As different sriciles of food are soluble in the stomach with various degrees of readiness, it is of importance to select those articles that are soluble with least difficulty, as well as to avoid mixing together in the stomach various substances which are of different degrees of solubility; hence it is salutary to dine off one dish. Animal food is much easier of digestion in the human stomach than vegetable, and a much less quantity of it is needed for nutriment, while it is not so likely to generate acidity. This, with a moderate portion of thoroughly-cooked vegetables, is, perhaps, the dict best suited for a feeble stomach. As regards the use of spirituous or fermented liquors, in the opinion of Dr. Watson—though some allowance must, no doubt, be made for custom—most dyspeptic persons would be better without any of these drinks. Finally, change of air, change of secne, change of society, usually exert a very beneficial effect in this disorder. "Get the patient of review in search of health, and the chances are in favour of his finding it."—Ref. Lectures on the Prixociples and Practice of Physic, by Dr.

pace, I breathe), in Path, is an embarrassed or laborious breathing. It is owing to a disturbance of she natural and healthy relation that ought to subsist between the quantities of blood and air in the lungs. When the quantity of atmospheric air that reaches the lungs is by any means diminished, or when there is more venous blood sent to the lungs than can be arternized under the ordinary modes of inspiration, then instinctive efforts are made to increase the quantity of air by increasing the number of acts of inspiration. Hence dyspiness may arise from a number of causes; as croup or laryngitis, diminishing the only inlet for the air; pressure upon the lung, or any other means by which its size is diminished, or it is rendered less spongy; or by increased action of the heart. The hysician has thus to decide, in such a case, whether the heart or the lungs he at fault, or both, or neither, and to prescribe accordingly.

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mental energy, and some confusion of thought. One of the worst of the excessional concomitants of dyspepsis is that state of mind which is known as hypochondrissis in Englage, and it has a greater variety of sounds that state of mind which is known as hypochondrissis in Englage, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and it has a greater variety of sounds in Englase, and the superhead by There is language, and it has a greater variety of sounds in any other tonge. It is formed by an arrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but a narrower opening of the glottis than the letter a, but an arrower opening of the glottis than the glottis t

charts it distinguishes all the easterly points. (See ABBERVIATIONS.) In Mus., It is the third note or degree of the distonic scale, answering to the mi of

degree of the diatonic scale, answering to the mi of the Italians and Resnot.

Raqua, \*-gi (Fr. aigle, Lat. aguila), a gen. of birds of prey, constituting the largest of the Falconida. In these birds the bill is of moderate length, with the ridge of the upper mandible straight from the base, at least as far as the end of the cere, beyond which it is destitute of the strongly hooked and acute, but is destitute of the strongly hooked and acute, but destitute of the strong tooth characteristic of the true falcons; and the lateral margins are more or less festioned. The wings are long and usually pointed, with the third, fourth, and tifth quills longest; and the tail is long, broad, and rounded. The tars are rather long, but vary greatly in their clothing, being sometimes is long, broad, and rounded. The tarsi are rather long, but vary greatly in their clothing, being sometimes covered with scales of various forms, and sometimes completely clothed with feathers. The toes are long and powerful, the inner one being usually stronger than the outer: they are all armed with long, strong, and greatly acute claws. The finest of the British species, and perhaps the finest of the group, is the well-known golden cagle (Aquila chrysadios). It is a solitary bird, building its nest on ledges of rook in the wildest part of the country, and far from the habitations of man. It is very common in Sweden, in Scotland, in the Trol. Francouns, and Susbia; more rare in in the Tyrol, Franconia, and Suabia; more rare in Italy and Switzerland; rather common in France, in the mountains of Auvergne, and in the Pyrenees; rare the mountains of Auvergne, and in the Pyrenees; rare in Holland; and less common in the Oriental countries. The general colour of the plumage is deep brown, mixed with tawny on the head and neck, the feathers on the back being finely shaded with a darker hue. The wings, when closed, reach to the end of the tail; the quilfeathers are checolate-coloured, with white shafts; the tail brown; feet yellow. It measures in length about three feet, with an expansion of wing of at least seven feet, and weighe about fourteen pounds. Its strength is prodigious. It has been seen to carry up to its lofty nest lambs of several weeks old, and even young fawns. It, however, now and then comes to harm through atures very much smaller than those mentioned. Bishop Stanley relates that a gamekeeper out on the moors observed an eagle rise from the ground with something it had seized as its prey. For a time it sailed away steadily, but suddenly it became agitated, and, after fluttering irregularly for a short time, spired upwards in a straight line to a vast height, and then, ceasing to flap its wings, fell headlong to the ground. Struck with so unaccountable an occurrence, the eagle fell suddenly and unaccountably from a great cagle fell suddenly and unaccountably from a great height, and, on being approached, a weasel peered out from under the great bird's wing, and scuttled off. The ring-tailed eagle is the one and two-year-old young of the golden eagle. Besides the golden eagle, there is snother British species of this family, which feeds on fish, and, for this reason, is always met in the neigh-bourhood of water. This is the white-tailed see-eagle (Hallockus albicilla). It is rather larger than the solden asade, but exhibits a smaller strant of wing golden eagle, but exhibits a smaller extent of wing. Despite this bird's large size and strength, it rarely Despite this bird's large size and strength, it rarely ventures to attack any animal larger than a hare; indeed, it seems to prefer its prey ready killed, and subsists for the greater part on stranded fish and the carrion carcases of such animals as it may find. This bird builds upon ledges of rocks that overhang the sea: the nest is composed of sticks, seaweed, and similar coarse material. The American or white-headed seamed. \*\*Italiatus Laucasenhalus\*\*) is found in every part. the nest is composed of sticks, seewhile-headed seacourse material. The American or white-headed seagle (Halladists leacoesphalex) is found in every part of the United States of America, preferring the low lands near the sea-shore to mountainous districts. It is this bird that America takes as its eymbol. It is about the size of the golden eagle, but of a lighter colour, and the legs are cayly feathered a little way below the knees. The bill is large, acutely hooked, and of a bluish colour. A row of strong bristly reatherer hangs from its lower mandible, and from this it takes its consistent name of Bearded eagle.

Its chief prey is fish, and he commonly secures it as it swims near the surface of the water. It would seem, however, to derive not a little of its aliment seem, however, to derive not a listle of its aliment by a stratagem much more ingenious than honest. The osprey, or hawk-flah, generally abides in the white-headed eagle's neighbourhood, and occasionally the latter, instead of fishing for himself, larks near the osprey. This bird, sailing gently over the water, watches till a fish appears in sight, and then, to use Wilson's words, "like a perpendicular torrent, it plunges into the sea with a loud, rushing sound and with the certainty of a rifle. At this moment, the eager looks of the eagle are all ardour, and, levelling his neck for flight, he sees the fish-hawk once more emerging, struggling with its prey, and mounting more emerging, struggling with its prey, and mounting in the air with screams of exultation. These are a signal for our hero, who, launching into the air, instantly gives chase; soon gains on the fish-hawk; each exerts his utmost to mount above the other. each exerts his utmost to mount above the other. The unencumbered eagle rapidly advances, and is just on the point of reaching his opponent, when, with a sudden scream, the latter drops his fish; the eagle, poising himself for a moment, as if to take more certain aim, descends like a whirlwind, snatches it in his grasp before it reaches the water, and bears it silently away to the woods." Besides those enumerated, there are the growned acids (forth, opposed) found in

grasp before it reaches the water, and bears it signify away to the woods." Besides those enumerated, there are the crowned eagle (Aguila, coronala) found in Africa; the superb eagle (Falco superbus) of Guinea; the cheels eagle (Falco Cheela) of India; the royal eagle (Aguila imperiatio) of South America; the royal eagle (Aguila imperiatio) of South America; the royal eagle (Aguila vilturina) of Caffraris.

EAGLE, in Her., the emblem of dominion, as well as of courage and magnanimity. It is generally borne with extended wings and lege, or "displayed," as it is technically termed. The eagle is assumed by Russia, Frussia, Austria, Poland, and America, as their national emblem, as the lion is the emblem of Great Britain. The eagle of Austria is represented with two heads. It was used by the Romans, Persiana, and Egyptians as a symbol or badge of empire.

EAGLE, in Mil.—The standards of the legions of the Romans were generally surmounted by the figure of an eagle perched on a small cross-bar at the top of the staff of the banner, with its wings raised. It was about the size of a pigeon or sparrow-hawk, and expecting covered throadsable in its claws. This

about the size of a pigeon or sparrow-hawk, and sometimes carried thunderbolts in its claws. This custom has been adopted in the French army, and all the French military flags are surmounted with a small

the French military flags are surmounted with a small eagle made of the new metal aluminium, and gilt.

Eagle, a gold coin of the value of ten dollars, current in the States of North America. (See Dollar,)

Eagle, Onder of the Black, an order of knights in Prussis, founded by the elector of Brandenburg on the day of his coronation as king of Prussis, Jan. 17, 1701. In addition to the princes of the royal family, the number of the knights was originally thirty, but it is now unlimited. A chapter is held twice in the year, and the anadidates for normalization must bathirty was a now unlimited. A chapter is held twice in the year, and the candidates for nomination must be thirty years of age, and able to prove their noble descent through four generations by both parents. The Black Eagle is the highest order of knighthood in Prussia, and, with the exception of foreign princes and knights of the order of St. John, no member of it is allowed to wear any other order along with it. It is generally worn by those who are in attendance upon the king; consequently makes the bolds it is reconstituted to travel those who are in attendance upon the king; consequently, no one who holds it is permitted to travel more than twenty German miles from the court without giving due notice. Knights of the Black Eagle are also knights of the Red Eagle. The insignia belouging to the order of the Black Eagle consist of an octagonal cross of blue enamel, with a black eagle between each of the arms of the cross. The cross is suspended across the left shoulder by a broad orange-coloured ribbon. On the left breast an embroidered silver star is worn. In the centre of the star is displayed a black tying eagle, bearing a thunderbolt in one claw and a is worn. In the centre of the star is displayed a black flying eagle, bearing a thunderbolt in one claw and a larrel wreath in the other. The legend round the eagle is "Suum quique." Every new member of the order pays fifty ducats towards the support of the order pays fifty ducats towards the support of the orders as a support of the order and the support of the order. Eagle, Orderson the roder and results for the order of knights in Prussia, founded by the margraf George Frederick Charles, in 1734, as a reorganization of the order de

Is Simplified instituted by the hereditary prince is Simulated by the hereditary primes of Anapach and Baireuth early in the centity. Fasterisk Milliam II. raised the order of the Beddingle. 1791 to the reak of the stoned crier in the measurements. The decoration consisted of a state Malasse cross, surmounted by a royal crown, with the Brandenburg cagle in the corner. In 1810 at man reorganized, two additional cinsees being included in it. The second of these classes was, in 1830, subdivided into two, only one of which wors the cross.

EAGLE-HAWK (Morpheus, or Spiendles), a gen. of Fallowids of the Hagie group, but consisting of species of comparatively small size, and characterized by short wings, long alender legs (tarsi), and comparatively fashle soes and claws. They are natived warm alimates, chiefly of South America, but also of Africa and the Best Indies.

Racus, Cow (Bub), a gen. of the Owl fam., found in

RAGIR-OWL (Bubo), a gen. of the Owl fam., found in

almost all parts of America. (See Owl.)

EAGLE-STORM, in Min., a variety of argillaceous iron ore, having a concentric structure and occasionally

ore, having a concentric structure and occasionally so decomposed as to contain a loose kernel that rattiles when shaken. The ancients imagined that this stone was the egg of the engle, the internal nedule being the embryo englet. (See also Graopa.)

Han, ser (Ang.-Sax.), in Anat. and Physiol., is the organ of hearing, and consists of three parts,—the external ear, the middle ear or tympanum, and the internal ear, or labyrinth. The external ear consists of an expanded trumpet-shaped cartilaginous structure, called the pinna or anticle, which collects the sounds, and a tube which conveys these sounds to the meanument, and fixed to the mangin of the meature sanditorius externus. It is of as owal form, with the margin olded and the larger and placed upwards. The round rimilite margin is called the laster, the depression immediately within which being the groove or fosse of the diately within which being the groove or focus of the helix. Within the latter is allarge elevation, called the heliz. Within the latter is alarge elevation, called the antiheliz, which presents at the upper part a well-marked depression,—the fossa of the antiheliz. In the centre of the pinns is a deep hellow, named the concise, which conducts to the opening of the meature anditorine. In front of that hellow is a projection of a triangular shape, called the tragus; and on the opposite side of the bollow, rather below the level of the tragus, is another projection,—the antitragus. Inferiorly the pinns is terminated by anoft pendulous part, called the lobule. The auditory canal, meature anditories externas, or the table by which sound is conversed from the pinns to the internal ear or tempanum, veyed from the pinns to the internal ear or tempenum is about an inch and a quarter in length, and is formed partly by bone and partly by certilage and membrane. Its direction is obliquely forwards and invards, and is somewhat bent downwards towards the middle, so that it is rather higher there than at either extremity. In shape it is rather fishtened from before, backwards, and it is necrowest at the bent part. The cartilaginous portion is about half an inch in length, and is formed and it is searchest at the best part. The carriagenous portion is about half as nosh in length, and is formed by the cartilage of the concha and tragus being projected inwards to the circumference of the auditory passage, to which it is firmly attached. At the upper and back part of the tube the cartilage is deficient, and its place is supplied by fibron membrane. The cosecous portion is about three-quarters of an inch in length, and is marrower than the cartilagious part. Its outer extremity is dusted and rough in the greater part of its circumference, for the attackment of the outling of the pinns. The inner end is less dilated than the outer, and is alsped, so that the anticior wall juts out beyond the posterior by about two lines: it is marked, excepting at its mapper part, by a narrow groove, for the insertions of the membrane tympani. The skin lining the auditory causalis, way thin, and closely adherent to the cartilaguasses and caseous portions of the tube. It is continued over the membrane of the tympanum in ing at any instances. It is not been added to serve the addition sense in easy thin, and closery the addition sense in easy thin, and closery the addition sense and caseous portions of the tube. It is continued cases the mentiones of the typeanum in the form of a kins politicle, forming its outer covering. Around the extense of the meature are some fine hairs, and there are also correspond a plants, which secrets ordines, and there are also once on the medical by separate ordines.

pharper by the Restachian tube. It is inswersed by a chain of small movable bones, which connect the mean trans-typicani with the labyrinth, and serve to convey the vibrations communicated to the membrane typicani screes the eavily of the typicanima to the internal ear. The cavity of the typicanima to the internal ear. The cavity of the typicanima to the internal ear. The cavity of the typicanima to the internal ear. The cavity of the typicanima to the internal ear. The cavity of the typicanima to the transverse, being a little broader behind and above than below and in front. The conter boundary of the cavity is formed by the securious typicani, and by a small portion of the supercading bene. This membrane is a kin semitation is a kin semitation of the capacidade of the typicanima from the bottess of the auditory canal. It is directed very chiqualy towards the auditory canal, its external surface being concave, as internal conver. It is composed of three layers, as already stated, is part of the integument liming the meatus. The middle layer is fibrous being formed of fibrous and clastic tissues, and fixed in the groove of the meatus. Some of the fibrous being formed of the meatus. Some of the integrand of the restact. Some of the integrating form near the centre to the circumference; others are arranged in the form of a dame circular ving treasurate the variety of the fibrous the form of a dame circular ving treasurates the variety in the servers. the meetes. Some Gruse intrearanges from seer upsecutive to the circumference; others are arranged in the form of a donse circular ring towards the mangin of the membrane. The internal inyer is innecess, being part of the mucous liming of the tympanism. The Eustachian tube is the channel through which air is conveyed from the pharynx to the tympanism. It is about an inch and a half in length, and is directed downwards and inwards to the pharynx. Like the meaning addicting it is nearly concerns and merity characteristics. downards and inwards to the puntying make each meature auditoring, it is partly osseous and partly cartilaginous in texture. The small bones or ossicles of the tympanum are three in number,—the malleus, incuand stapes. The malleus—so named from its fancied resemblance to a hammer—consists of a head, neet, and the control of the contro handle, and two processes, a long and a short. The inous—so called from its resemblance to an anvil, but which may rather be said to resemble a bicusped tooth, with one of the roots longer than the other, and bent to one side—consists of a body and two processes. The stapes is so called from its close resemblance to and a base. These small hones are connected together and with the tympanum by ligaments and moved by enually nucles. The handle of the mallens is attached externally to the membrans tympani. The head of the mallens articulates with the body of the incus. The malless articulates with the body of me mean. The shorter process of the incus is received into an aperture of what are termed the mastoid cells; the long process curving downwards and ending in a rounded convex point, where it articulates with the head of the stapes. This last has an incrizontal position, with the crurs or branches directed forwards and backwards, and backwards, the fractic oralis of the and its base is fixed over the fenestra ovalis of the internal wall of the tympanum. This is a reniform opening leading from the tympanum into the vestibale, the opening in the recent state being closed by the liming membrane, which is common to both cavities. The inner and fundamental portion of the organ of hearing is called, from its complexity, the labyrinth, and consists of three parts,—the vestibule, the semi-circular canals, and the oochles. It consists of a series of cavities channelled out of the substance of the petrous bone, communicating externally with the cavity of the tympanum and internally with the me auditorius internus, which contains the auditory nerve. Within the osseous labyrinth is contained the massbrenous labyrinth, upon which the ramifications of the auditory nerve are distributed. The vestibule is the common central cavity of the osseous labyrinth, and is placed behind the cochles but in front of the semicircollar canais. It is somewhat oval in form from being backwards, and measures about one-fifth of me is in different directions, but is marrowest. From withe inwards. In its americar wall is a large oval open the cartifuguration and concerportions of the dube. It is continued over the membrane of the tympanam it is continued over the membrane of the tympanam it he form of a tikin politicle, forming its outer covering.

Around the estimate of the membrane of the tympanam is superior walls are five openings, by which it commands to cate with the semicircular canals. These are three body canals standed above and believed the restriction cates with the semicircular canals. These are three car, wax, and open on the semicircular canals only canal situated above and believed the restriction. The middle car or tympanams is an integralar cavity situated within the petrous hone, and, interposed between the mealing auditorium and the acquire to the castillate of a care of the car These are three

tained within the dings and subdivides persund along the outer g about one-tenth of an liminishing to half that size tothe semicircular canals a hen, is lined with a thin fibrons the outer surface of which adheres closely is be sufer wifface of which adheres closely be, while the inner is covered with a single pitalities, like that on scross membranes, as all in scross fluid, called the layour co-stlyingh. This fluid fills the passages of the six maintenance structure are not subvisith, is maintenance structure from its limit membrane printly, and semisted from its limit membrane. as its a middle manuscus structure inclosed within the as hapyinght, and somewhat from its liming meaning the parilymph. It is confined to the vertibule manipular samals, laving the general form of the middle bony parts, and is compact of a closed structure of the complex form, containing a fluid the embodymph. That part of the membranous ack sessions of two d postions, which though closely connected in, appear to be distinct sees, the larger of the he missis or common sinus, being situated at show, appear to be distinct sees, the larger of the bake, appear to be distinct sees, the larger of the control at a part of the vestibule; the endule, is smaller and rounder, and is situated at the endule. I smaller and rounder, and is situated at the vestibule. Smaller nes, the saccule, is smaller and rounder, and is sta-d, is the lower and fore part of the vestible. Small issueds, masses or otoliths, consisting of minute maked and elongated grains of carbonate of lime, are make in the inner part of the wall of the utricle and because in the inner part of the wall of the uncere and because. The auditory nerve, which is distributed over the different parts of the labyrinth, enters by the measure auditorius internus, and divides into two branches; viz., an anterior for the cochiea and a pos-terior for the membranous labyrinth. The occhiea such divides at the base of the modiclus or axis into erous twigs that enter the apertures in that body, thence they are directed outwards. The vestibular the membranous labyrinth, and ramify themselves on the walls of the sace, some of the file filaments passing brough the otolith, others outside of it. The sense of aring is, strictly speaking, only a refinement of the see of touch. The impressions with which it is conrement arise wholly from peculiar undulations of the resticles of ordinary matter, propagated in obedience of the ordinary laws through the medium in which the is its sectionary laws through the unclum in which une minimal lives, and impinging more or less immediately again a sensitive part. The trumpet-like pinns or markets of the external car serves to collect the sound, which is then conveyed, by means of the meature andi-limits externity, to the membrana transpani. This is through into vibration, which is communicated to the malleria, and is carried by the incus and stapes to the less, and is carried by the incus and stapes to the measure of the fenestra ovalis. From this last the time is communicated to the various parts of the measurement showing the property of the manufacture start, and conveyed to the brain. The off the small calcareous masses in the sacs is to nightin the sucrous undulations, and to commutate to the nerves stronger impulses than the lymph as could impact. The range of hearing, like that tight, differs very much in different individuals. (See

, servicing, an ernament wors in the ears, we to be bored, in order that it may be from passages in Jeromiah, it appears that y the Hebrew wome e person with carri en in bie

Kalang San

the attful special the British Mus of Queen Elizabeth and Jamby men as well as women. At the lingland, women alone wear sar-rim Ringland, women alone wear six-rings; many successive wear small reund rings in their ears. When the ears are bored, a slight inflammation generally occurs, which sots as a counter-irritant in the ears of sere types. This is often adduced as a teason for putting rings in the ears. Young giffs usually have their ears bored for ear-rings when about even years of age. Ear-sunt. (finishely, a pain of marrier mollanes, the shell of which somewhat resembles in shape the muman ear. The head of the animal is harge having two long round tentacula, with eyes at the best o footstakes. Foot very large, having the margin franged all round. It is always found near the sension of the water. Found in the East Indies.

EAR-ENDERS on instruments applied to the our in cases of partial deafness anising from injury to the membrane of the drum of the ear, want of property as expitibility in the suditory neves, and other essession. It is made of metal,—eliver or going-metal remains small. however, wear small round rings in that

cases of the drum of the ear, was a comment of the drum of the earthful of the auditory nerve, and other ceptibility in the auditory nerve and a ceptibility in the acet an It is made of metal,—eliver or song-meta sidered the best, and it is curved in fo being small energh to enter the ear, bell-shaped, and expanding outwards of a trumpet; whence it derives its name or a trampet; whence the rays of sound, and to converge by reflexion on the mounts drum of the ear, like rays of light collection by means of a lens. The collection of sound causes them to set on the drain greater power. There are many different a ear-trampets, differing from each other in comb but being all made on the same principle, to and concentrate the rays of sound. Some and concentrate the rays of son small, such as the surisis and surcess worn in the ear or attached to the i springs; others are made of sudia rable of long tubes, with a bell-maned opening: like the metal instruments. There are all membrana tumnari membrane tymposi, or membrane of the drum of the ear, made of vulcanized india-rubber, which are intro-duced into the orifice at the end of a piece of sives were, and are found extremely useful in cases where deafness arises from perforation of the natural mem-

Execute, eer-wig (Sax. our and wiggs, a worm or grub).—These insects constitute the order Der-mapters of Leach, and which Westwood, who also or grub).regards them se forming a distinct order, he insted Eupleroptern. The latter using references regards usern as torming a manner other, may deficile instead Emplementary. The inter using refers to one of the most striking characters of the entragging, the structure of the hinder wings which are exceedingly beautiful. "In these the radiating heavares, instead of finding their common centre at the base of the wing, as it he case is most ordespiere, spring from the extremity of a broad leathery piece, which occupies about a third of the underion sample. Other radiating nervures coonly the space between the principal nervures, but only run from the posterior margin. By the same between the principal nervures, but only run from the posterior margin. By the same stance of these nervures, the wing, which is of very delicate texture, folds up exactly the shape of a closed fau; but as the wing eases of the sawing are very short, the wing can only be get under them by a very complicated from very short, the wing to make the market piece and at a second point should be active them to the active of the wing where the nervures agrees to be made them by a very short, the wing the same of the same wing are very short, the wing the same of the same leathery bessel piece and it a despine middle of the edge, where the nerviral ficiencesel. Even the spec of the first wing societie beyond the silver. — (I as we distinguished from the orthopsine coping the Histor and Monte trible). Registle, conflicts Latrette's man.

number of their joints of a rounded form, and but loue as is the fancy, there is no et's name, earwig, is furnished by will creep into the ears of sleeping Entropean countries the insect's appel-pant of the belief Newman, however, toon to the "History of Insects," says, pe of these wings (the hind ones), who ; and this exemusiance it access highly probable that sixell name of this insect was ear wing." Earsipear to prefer damp situations, and are found signes and under the bark of trees in great upper some and under the own of trees in great shyndence. They subsat chiefly on the leaves and flowers of plants, and on fruits. There is in this country sucher species of carving almost equally com-tion with the above, but of a much smaller size. Thus ter is found about hotbeds and dunghills, and be

Inster is found about hotbeds and dunghills, and be longs to the genus Labia

Hills, et Ginx cont. Dan parl), an honorary title of distinction given to noblemen, who take rank between marquises and viscounts. The term originated with this nations of the north of Europe, who applied the little of "int" (pronounced yarl) to theftains of the highest rank, who were appointed by the sovereign to govern large tracts of land, having the powers of a viscouy as the administration of justice, but being also under the obligation of furnishing, equipping, and maintaining a certain number of men as a contingent to the mational force, and of soting as their leader when the necessities of war compelled the king to call them out for actual acruse. The dignity was, in fact, equipment among the Teutonic nations to that of the them out for actual service. The dignity was, in fact, equivalent among the Teutonic nations to that of the Roman serves, or count; and the appellation was the highest stile of honour that the monarch could confer it was introduced into England by the founders of the Saxon heptarchy, and then applied to the nobles generally, in contradistinction to the certs, who were free men, forming the large middle class of the Anglo Saxon instant The earls, who presided over the courts of justice and public meetings of the district or shire intended by the title of soldownen, were further distinctions to their management, were further distinctional of the title of soldownen, but this appellation used to their management, were turther distin-had by the title of soldownen, but this appellation making fell into disuse, and at the time of the Con-title Saxon governors of shires, whose rank was replant to that of the present lord leutenants of titles, were all styled earls. Among the most noted to powerful of the Anglo Saxon earls was Earl, white son Harold encanded and the Anglo Saxon earls was Early s powerful of the Anglo Saxon earls was Earl whose son Harold succeeded Edward the property of the English throne. Under William the sections were held by tenure, and the successed of local jurisdiction and power, and the claim to claim a certain portion of the local is wome of them, such as the earls of Chester, partiaments, created barons, and had their fatate like the king himself It remained the state like the king himself. It remained the te off sank in England until the latter part a century, when the dignities of duke and the infracticed, the holders of which took at the cart. The title, which is now granted beauty was formerly conferred by the king who lavested the earl, at his creation, with a settling on his avonet and and and the cart. ng on his coronet and garding on his

TALL OF BUGLAND, the title of one of the to power of granting armorial bear-ion in matters relating to pedigrees in arms, through the kings at arms, me, through the kings-warms, is Marroy, who act as his depu-tareditary, and attached to the Charles II in

ared to have pro to 1307, or during the reig Henry III., and Edward I fullest development about ti fallest development about the management tury. Some writers have proposed the architecture of the first part of Lancet, and that of the latter part at but it will be sufficient for general purpoit as the characteristic style of the life. this style the strength and solidity of An architecture was returned, but it was softened a dued by the introduction of more graceful for a greater degree of currenment. The heavy Anglo-Norman columns were replaced by infinite more elegant shafts, having the appearance of se of small columns clustered together round a se s, and the semicircular arched and windows was replaced by one of a pointed or land shaped form. Sometimes two or three of these pour shaped form Sometimes two or three of these paid lights were grouped together, separated only by has piers When three were thus brought together, centre light was considerably higher than those either side, and in any case a continuous moul surmounted the whole of the arches In the latter of this period two or more lancet-pointed window were often surmounted by an arch of the same form pierced with a cusped circle, or with trefolls and quet foils, and this led to the elaborate tracery that man the windows of the Decorated period The doors were deeply recessed, and the sides of the splays were adorned with deeply-cut mouldings, they were also surmounted with a dripstone or moulding prof from the wall, and springing from carved be corbels The buttresses were narrow, but projected corbets The buttresses were narrow, out projessed to a great distance from the walls, they were also divided into two or three stages, each projecting less than the one immediately below it Flving buttresses were also introduced, and string courses were commonly used The walls were ornamented with disper-work, the surface being carted or painted with a small regular pattern, generally of trefoils of quatrefoils. The capipattern, generally of trefoils of quatrefoils. The capitals of columns were bell-naped, swelling outwards from the shaft, with an horizontal section similar to from the snart, with an interest when were carred with iolinge boidly rendered. The roofs were sasep, and for the most part open, some, however, were vaulted and ground fallabury Cathedralis considered the best example of this style of architecture, as it belongs wholly to the Early Frighish period, and no other style is consequently found in combination with it. Parts of Westminster Abbey, Lincoln, Wells, and Hereford cathedrals, and York Minster, are also built in this style. In Plate XLVII, figs 1 and 2, are given two examples of the Early English style of architecture, and at fig 1, Plate XLVIII, an example is presented of an Early English window.

Exensel, or nest (Sax cornest or geornest, Lat. arche, whence, in Scotland, it is called arles), is something given in order to bind a bargain,—usually shall sum of money. It is also applied to any simple execution of the same and a second of the same and the second of the same and the same of money. that of the shaft steelf, and sometimes they were carred

thing given in order to bind a bargain,—usually a sum of money. It is also applied to any simple a mony for the same purpose. Audiently, among all northern nations, shaking of hands was held necess to bind a bargain, a custom, say Blackstons, why we still retain in many verbal contracts. A sale is made was called hand-sale; and in process of sime same word was used to signify the price or same which was given immediately after the chaking hands, or instead thereof. By the sivil law, her recedes from his bargain loses his carnest; and it person who received the earnest entire, he made was the carnest and the carnest double. By the law of England, however, the carnest double. By the law of Em if any part of the price be paid down a any portion of the goods delivered and the agreement, and attended to the large person is obliged, in a real factors. This officer was styled by his bergen; and in case he decline the state of the colors was styled by his bergen; and in case he decline the state of the state of the state of the whole amount.

AT A THE PARTY OF THE PARTY OF

It is sear jumping the grants are asset, as we recent in 1869 between the finn and Meestury. Its mean distance from, the firm is \$8,000,000 inflee, and if performs an annual resolution round that body in \$36 days, 6 hours, 9 ministrately segonds. The form of the earth, speaking is giovaler, or spherical; and the simpliest sevent to the form of the earth, speaking is shall the extent of land or water over which we can look is much greater when we are on the top of a monitosist of hoth lower, or at the mast-head of a vessel, that when we are on deel, or on the ordinary level of the grainst water that the tops of the masts of a vessel at sea always came into sight before the hull, which would not be the grainst water that the tops of the towers of the water. The same effect is also visible when we appreciate a six on land; the tops of the towers and the spires of the churches are seen before buildings of less altitude rise into sight. But, strictly speaking, the spires of the Sarth is that of an objet spheroid, that is, the shape of a sphere flattened at the poles (fee Dissans). The proportion between the dismeter of the Earth at the equator and the distance from relation to the last the or the seed to the sur the second to the sur the sur the sur the sur that of an objet or the Earth at the equator and the distance from the Earth at the equator and the distance from the sur that the sur that the poles to the sur that the poles to the Earth at the equator and the distance from the sur that the sur that the pole to the surface of the Earth at the equator and the distance from the surface of the Earth at the equator and the distance from that is, the anape or a space management of the Essan 3 The proportion between the diameter of the Essan at the equator and the distance from pole, to pole, has been stated to he as 300 to 290 Taking, then, the circumference at the equator to be 31,600 geographical miles, or 24,876 English miles, replicating 39 I English miles to be equal to a degrap, and approximately miles, we find the equatorial damerestrong or a languan mure to be equat to a degrae, or 60 seegraphical miles, we find the equatorial diameter to be very nearly 6,875 5 geographical miles, or 7,935 Regists miles, and the polar diameter to be 4,865 5 geographical miles, or 7,831 9 English miles. The europe of the Earth may be estimated at about The surface of the Farth may be estimated at about 150,000,000 geographical square miles, or nearly 250,000,000 geographical square miles or nearly 250,000,000 Engish square miles miles that the distance from the Earth's centre to the poles is less than it infrom the same point to any part of the equator has been proved by actual measurement of arcs of the meridian at various places, which shows that the length of the degree of latitude increases as we approach the poles, which would not be the case if the Earth were exactly spherical, instead of becoming Sattened towards those regions. The motion of a pendulum, also, is accelerated the nearer it is brought to the poles, which shows that the force of gravity movemes from the Earth's centre must consequently be taken from the Earth's centre must consequently bess. The density, or specific gravity, of the Earth is

i at the Mosta structure at Afferent of courses. (See Bury, Merrouse, 121.) An ore descend, below the

emitical, as in the shall of a sociation for example, the host is from to increase to the state of 1 Tabraham for example, the host is from to increase to the state of 1 Tabraham for the first over 15 or 21 yarder for it is not at all certain that this would be found to be a fixed law, and that the heat would increase in this latio as we approached the centre of the Earth, if it were possible to do so.

approximent the center of the means, it is more powerful to 60 so.

ERREMENTALE, erth-spair (Ang.-Bex.), file general name given to all atensits mean of day, which may be divided into three classes;—first, pottery, consisting of jugs and pass of a coarse description, red and brown in colour, that are made of a sommed not have in colour, that are made of a sommed hand of clay; secondly, porcelam, or vessels made of a reyr fine clay, with which a preparation of first a mingled that fuses when the article is subjected to great heat and smalgamates with the stay, which will not melt, rendering the vessel seam; transparent (see Porcelam), and thirdly, the ordinary household ware, made of various kinds of clay that burn white, which differs from porcelain in being completely opaque, and to which the term eartheuwire is more properly applied and limited. The clay that is priscipally used in the Staffordshire potteries considerant in the manufacture of porcelam, and known as China the clay that is priscipally in Comment. cipally used in the Staffordshire potteries consil from Dorsetshire and Devonshire. The finer clay used in the manufacture of porcelam, and known as China stone, China clay, and kaolin, is found in Corawall, principally in the neighbourhood of St. Anstell. It consists chiefly of disintegrated grante; but the shareful excellence of the, as well as of the Devon and Dorset clays, consists in its freedom from any impregnation of iron. To obtain the soft clay, large square pits are sunk in the earth, under which it has been assortished by boing that a stratum of clay hes. The sides of the pit are kept from falling in by a sheeting of boards and laggots, sustained ity transverse beams running from side to side, there after there, so that the interior looks like a network of wood. The clay is cut in ready cubes neasuring about eight or nine inches every way; these blocks are then taken to the drying-yard, where they are attacked in large sheds, and allowed to dry before being removed to be shipped for the Potteries. The China stone of Corawall is hard enough to be regularly quarried. The process of making surfiberaries the Potteries is as follows.—The clays is action—the ware at the Potteries is as follows.—The clays is caused with water, generally by means of machinery, until it assumes the consistency and appearance of cream; it is then filtered through fine sever until the mirature into this have been heated to reduces and calcund by being thrown into cold water, after which they are broken and ground to a fine nutrit with a addition increases as we approach the poles, and that the distance from the Earth's centre must consequently believe. The density, or specific gravity, of the Earth is the constant of the mixture is the same size, the weight of a equal sulfief water, that is to say, if we could compare assertly the same size, the weight of the Earth would be feet times as much as that of a sphere of water exactly the same size, the weight of the Earth would be feet times as much as that of the water. This was employed to be the case by Newton, and his supposed to be the case by Newton by the case of the later. This was a much and the case of the later by the case of the later his known, and his supposed to the potential parts of the supposed to the potential parts of the

epindle in the latte. The rest of the process is similar to that of throwing. The pieces are then placed in boxes made of fire-clay, called "segara," and baked in a kiln for about forty-eight hours, a gentle heat being applied at first, which is gradually increased in intensity until it becomes very great. After baking, the ware is called bisentle, and it is then ready for the final processes of colouring or printing, and glazing. Painting in various colours is confined entirely to porcelain and the better and more expansive kinds of earthenware. The common yellow were is ornamented with rings, spots, and wavy stripes of blue and white, by allowing colouring matter to fall on them from perfected funinel-shaped vessels while the article is reviving on the latte. The coarse blue pattern reasmbling sea-weed is produced by striking a brush charged with colour smartly against the vessel. When the water is printed, the pattern is first engraved on copperwarels printed, the pattern is first engraved on copper-plates, from which impressions are taken on very thin paper in the desired The paper is laid on the ware while the impression is rubbing the back of the paper lightly with a piece of cloth rolled tightly together. The paper is removed by soaking the article in water for a short time, after which the paper readily comes away, leaving the pat-tern printed in colour on the ware. The last process tern printed in colour on the ware. is that of glazing, the glazing matter for common ware being made of a mixture of litharge and calcined flint, and the better sorts, of a compound of lead, flint, glass, and sait reduced to a state resembling thin cream and sait reduced to a state resembling thin cream.
After the ware has been dipped in this mixture, and
wetted theroughly all over, the articles are again placed
in the acgaza, and subjected to heat just strong enough to
fuse the glaze, which produces the smooth, transparent,
polished coating with which our various household utensils in earthenware are covered, and without which they would be rough to the touch, and liable to absorb oil and greasy matter, so that it would be consequently impossible, or at least a matter of difficulty, to keep them in a state of clembiness. An historical sketch of the rise and progress of the potter's art, and the best and most remarkable kinds of earthenware that have been produced at various periods, will be found else where. (See Porren's ART; Majolica, Palissy, and WEDGEWOOD WARE.) It is only necessary to observe here, that although we may be surpassed by China and other nations in the production of the more beautiful corts of porcelain, yet the solidity, strength, resistance to the action of fire, and the cheapness of English earthenware, have rendered it an article of commerce that is exported to every part of the world, and is pur-chased in preference to that produced in any other country.

EARTH HOUSES, recesses in the earth, so called in Scotland, which seem to have been small natural caverns, or artificial chambers hollowed out to serve as a hiding place in time of war for men and property, or as storehouses for corn and provisions for the winter. They are generally long and narrow in form. the largest being about 10 feet wide, 50 feet long, and 6 or 7 feet high. The sides are formed by a wall of sough stones, and the earth above is sustained by a ceiling of undressed slates or flag-stones, the ends of which are supported on the side walls. The entrance is small and near the top, and constructed in such a manner that it could be easily masked if necessary. When the floor was wide, the walls were brought closer specified beyond the one below it, until the interior assumed somewhat of the form of a vaulted passage. They are not far below the surface of the earth, and ings are not far below the surface of the earth, and are generally found in dry situations in the side of a hill or cising ground. Remains of various kinds have been found within them, which shows that they were used as temporary retreats, if not as permanent places of abode. Decasionally two or more chambers are found communicating by a small passage. These curious underground chambers are sometimes called

frequency and violence usem to be consrected with the intensity and activity of the volences near them. Rearly all volence phenomena are excompanied by trembing and shaking of the earth in the signeent districts. On many occasions they precede volence emptions, and cease as soon as the truption takes place. It is singular, however, that the most severe earthquakes take place in recome for reward from volumes; and take place in regions far remote from volcances; and districts in which there are the remains of extinct vol-cances are not more liable to earthquaires than other places. Egypt has been more exampt than, perlaps, any other country; but an earthquake countred there in 1740 A.D. They sometimes happen in the middle of the ocean, and cases have countred where relamine islands have been thrown up, and afterwards have disappeared. It has been calculated that not less than twelve or thirteen earthquakes, destroying both life and property, happon every year. When they life and property, happen every year. When they occur severely, there is, first, a trembling; then a severe shock, or a succession of shocks; then a trembling again, which gradually dies away. The most violent shocks are instantaneous, and there are seldom more than three or four. When there is more than one violent shock, there are smaller sheeks or trem-blings between. Sometimes whole cities have been one violent shock, there are smaller sheeks or treen-blings between. Sometimes whole cities have been destroyed by an earthquake, and sometimes fer-tile districts, with all their fruits and produce, have been laid waste. At the great earthquake of Lisbon, 60,000 human beings perished; and in Calabria, at the end of last century, 40,000 persons dost their lives in a similar manner. It has been exiculated that at least shirteen millions of the human race have thus been destroyed. When an earthquake occurs, observers destroyed. When an earthquake occurs, observers state that the shock has at first a distinct vertical state that the shock has at first a distinct vertical direction, coming from below upwards, but afterwards the direction of the motion becomes gradually more horizontal, till it ceases. This motion is evidently caused by an earth-wave, or undulation of the solid crust of the earth. In the case of the earth-galace at Lishon, before mentioned, the course of this wave was acceptly absoluted. roughly calculated. It must have moved very rapidly, not lasting at any point more than a second of time. The extent of area over which its influence was felt was very great. To the north, it was felt on the southern shores of Finland, and towards the west, beyond the St. Lawrence in Canada, and also in the West-India islands. The whole area affected could not have been loss than whole aren affected could not have been less than 7,500,000 miles! The raising of the earth over such a vast surface of course affected the sea; and the wave thus formed attained a height of sixty feet at Cadra, passing far beyond the ordinary limits of the tide. There are a great number of theories propounded in order to account for earthquakes; but they all agree in tracing them back to volcanic agency. The starting-point of all is the acknowledgment of the existence of a molten fluid mass in the interior of the earth. generation of immense volumes of elastic gases under the influence of the heat of this mass, would necessarily result in an explosion, which would account for many of the earthquakes which occur. At a meeting of the British Association, Mr. Mallet proposed an ingenious theory. Assuming that the lines or centres of volcanie action are not far removed from the sea, he argued, that when an eruption takes place under the surface of the water, an opening or fissure results. Through this the water would descend to the central fire. Arriving there, it would take the spheroidal form until the surface with which it was in contact was cooled, when an explosion would take place amply sufficient to cause an earthquake. The latest theory of earthquakes is that of the brothers Rogers, who state that the producing cause is an actual pulsation of the molten fluid mass in the interior of the earth. This pulsation is carried forward in the shape of great waves, from large rup-tures caused by the tension of clastic matter, bearing been found within them, which shows that they were used as tempowery retreats, if not as permanent place in and the programment of the of abode. Consistently two or more chambers are found communicating by a small passage. These curious underground shambers are sometimes called Ficts houses.

Exempovers, seth tweet [5ax, cwacian, to tremble), a term applied to say shaking or tremor of the outer surface or solid crust of the globe. No part of the set is the feel them. They are, however, most the set is the registrostrood of volumoes, and their of level plains. The mysterious nature of earthquakes and superalent in the neighbourhood of volumoes, and their

is an incentive to their study; but every attempt at explaining their origin must be, at the best, theo-

EARTH'S CRUST. (See Grology.)
EARTHS (in Chem.).—The earths proper are ten in EARTHS (In Chem.).—The energing proper are ten in number,—alumina, gluoina, giconia, thorina, yttria, erbia, terbia, ceria, lantania, didymin. They are distinguished by being soluble in water, but dissolve in caustie sikalies and their carbonates. They are all oxides of metals which do not decompose water. Many of them have been but imperfectly examined many or them nave been but imperieurly examined, owing to their extreme rarity. Alumina, a constituent of all clays, and glucina, found in the emerald, are the most important. Alumina, by its isomorphism with sesquioxide of iron and other peculiarities, connects the earths with the oxides of the heavy metals.

the earths with the Oxides of the heavy metals.

BARTHS, ALKALINE. (See ALKALINE BARTHS.)

BARTH-WORES, in Mil., intrenchments hastly thrown up, consisting chiefly of a rampart and ditch, and serving as temporary lines of defense. At the siege of Sebastopol, the southern side of the city was mainly defended by earth-works of great extent, size, and strength; and from this circumstance it is now considered that works of this kind are as serviceable as those of stone for permanent defences, and have the double merit of being less dangerous to the defenders, since no splinters of stone can fly about, as is generally the case when a block of granite is struck by a cannon-ball, and more easily repaired. It is not, however, likely that earth-works will supersede ramparts of stone against the heavy artillery that is now coming into use, but that our stone walls, like the sides of our vessels, must be rendered better able to resist the "cheavy brunt of cannon-ball" by being coated with

armour-plates of iron. EARTH-WORM (Ang.-Sax.) (Limbricus, Linn.), a well-known annelide. Its outward appearance is a body composed of numerous narrow rings closely approximated to each other; the colour of the body is reddish, or purplish; of a cylindrical form, some-what pointed at the anterior extremity, and usually a little flattoned at the tail. It is without the organs of little flattened at the tail. It is without the organs of sight. The organs of motion consist of a double row of bristles running down the lower surface of the body, and which are capable of being withdrawn within small hollows when not in use. The mouth is unsarmed, and the intestine runs straight through the body. The running along the ventral and dorsal regions of the body, and united by numerous branches. The blood is red. Like the leeches, this worm is furnished with ciliated canala, which have been supposed to serve as organs of respiration; but their real destination appears to be still uncertain. As far as relates to its appearance above the ground, the earth-worm may be regarded as a nocturnal animal. In the night and at early morning, hundreds may be seen in localities where, during the daytime, not one is to be seen. They are of immense utility in improving the soil. The organs of the earth-worm's locomotion prevent its moving backwards, whilst the expansion of the rings, as it contracts the anterior segments and draws forward the hinder parts, widens a passage for it through the earth, whose particles were close together before. They are thus, in their multitudes, of incalculable utility an constantly loosening and stirring the soil, and accumulating on the surface those little hillocks of earth known as "worm-casts." On this subject Mr. Charles Darwin, who seems to have given it long and careful attention, remarks: "The burrowing of earthworms is a process exceedingly useful to the gardener and agriculturist; and these animals are far more bene-licial to man in this way than they are injurious by devouring the vegetables set in the soil. They give devouring the vegenous sees in beaut. They give a kind of under-tillage to the land, performing the same below ground that the epade does above the garden, and the plough for arabic land; and loosening the earth so as to render it permeable to air and

farmers to the working down of the materials in question, is really due to the action of the earth-worms, appears from the fact that in the soil thus formed large numbers of worm-casts may be distinguished. large numbers of worm-casts may be distinguished. These are produced by the digestive process of the worms, which take into their intestinal canal a large quantity of the soil, through which they burnow, extract from it the greater part of the vegetable matter it may contain, and eject the rest in a finely divided condition. In this manner a field manured with manual has been considered. with marl has been covered in the course of eighty years with a bed of earth averaging thirteen inches in thickness." Besides their usefulness in the manin thickness. Hesiaes their user ages in the manner above described, the earth-worms are of importance as food for birds, fish, &c. Their value as beit for fishes is well known to evey angler. The power of reproducing parts after mutilation is very great in this animal, as in the whole of the order. It is generally this animal, as in the whole of the order. It is generally supposed that the earth-worm may be propagated by division; but this searcely appears to be the case. It is said, however, that if it be divided across the middle, the part bearing the head will develop a new tail, although the tail will soon die; and that if the head be cut off, the body will form a new head; but it appears that both portions never survive the mutilative.

EASEL, e'-zl (Ger. esel, an ass), a frame on which a painter supports the cauvas on which he is working, in a slightly slanting position. It consists of three long legs councided by hinges at the top; which extend and form a tripod. Holes are bored in the faces of the two legs against which the painting rests, in which the two legs against which the painting rests, in which pegs are inserted, which support the picture, and afford the means of raising or lowering it to the height and position that may be desired. Easel pictures, among painters, are the smaller pieces which are painted on the easel, as distinguished from those which are drawn upon walls, ceilings, &c. East, cest (Sax. east, Ger. ost), the quarter of the heavens or point of the horizon where the sun rises at the courses in March and Santarnhar. When we

the equinoxes in March and September. When we are looking towards the north, the east is on our right hand and the west is on our left; and vice verse when when we look towards the south. The east may be pretty nearly determined, and from that the other points of the compass, by calling to remembrance the point of the horizon in which the sun rises, making due allowance for the time of year; and if we are near a church it is still easier, as it is a fixed rule to build a church in such a manner that the chancel and communion-table is at the east end of the building, or points directly towards the east.

EASTER, cest'-er (Sax. castre), a feast held by the Christian church in commemoration of the resurrection of our Saviour. It is a movable feast, occurring at any date between March 21 and April 25; and by it the other movable feasts throughout the ecclesiastical year are regulated. It is held about the same time as the Jewish Passover, or Paschal feast, although it very seldom happens that the Christian and Jewish featurals are observed on the same day. In the Greek and Latin churches Easter is still called Pascha, from the Jewish name for the feast of the Passover. The term Easter has been derived from various sources; some taking it from the Saxon osier, 'to rise,' and others from the name of a heathen goddess, Eostre or Ostara, whose rites the Saxons were accustomed to celebrate at this time of the year, and on account of which the month of April was styled Eostermonath in their calendar. It was a period of rejoicing with them, on account of the return of spring and the renewal of vegetation; and the name and the accompanying simple ceremovies that attended the festival, such as lighting fires, &c., were easily adopted by the Christian church in Britain, which taught that it was to be observed as a season of rejoicing, as it was held in commemoration of the resurrection of our Saviour. In the early church this garden, and the plough to arrange and; and mosening resurrection of our Saviour. In the early church this the earth so as to render it permeable to air and festival lasted for some days, and catechumens were add to the depth of soil; covering barren tracts with a layer of productive mould. Aftau, in fleds which have been overspread with lime, burnt mark, or cinders, these substances are in time covered with finely dither the substances are in time covered with finely divided soil well adapted to the support of vegetation. Catholic column it is time of eight of column to the finely divided soil well adapted to the support of vegetation.

commonly interchanged in families and among friends in Russia and all countries in which the Greek faith is In Resea and an countries in which the Greek islin is established. There were many popular observances of Easter in various parts of England; such as eating tansy cakes and puddings; but these have fallen into disuse, although many still make a practice of wearing some new article of dress for the first time on Easter some new article of dress for the first time on Easter Suuday, alleging that it is unlively not to do so. In determining the day on which Easter is to be held, the council of Nice, in 325, decided that it was to be celebrated on the Sunday following the 14th day of the first month of the Jewish year, on which the Latin or Western church had been accustomed to hold it; and on the introduction of the Gregorian calendar, a table was constructed, based on the Metonic cycle, by which Easter was to be found, and which the Church of England still uses. In the Book of Common Praver, we are told that "Easter Day is always the First Sanday after the Full Moon, which happens upon or next after the Twenty-first Day of March: and if the Full Moon happens upon or sunday Easter Day is the Sanday Woon happens on a Sanday, Easter Day is the Sanday after the Iwenty-Inst Day of March; and it the Idn Moon happens on a Sunday, Easter Day is the Sunday after." Now the moon above alluded to is not the moon of the heavens or the mean moon of the astronomers, but an imaginary moon, the movements of which follow the movements of the real moon by an interval of a day or two. Therefore, when "full moon' is spoken of in the directions regarding Easter given above, we are not to take it as the time when the moon is at the full in the heavens about this period, but the 18 at the full in the heavens about this period, but the 14th day of the imaginary moon of the calendar, which falls upon or next after March 21 in any year. To find this 14th day, or "full moon," of the calendar, and consequently Easter-day, we must have recourse to the table below, taken from the Prayer Book. Having found the golden number for the year (see Golden Numbers), look for it in the first column of the table; and the date which is in a line with it in the second column, is the day of the full moon of the second column, is the day of the full moon of the calendar. Next find the Sunday or Dominical letter for the year (see DOMINICAL LETTER), and the date which is opposite the first occurrence of the Sunday letter in the third column, reckoning in all cases from that letter in the column which is in a line with the date of the full moon already found, will give the day of the month on which Easter Sunday falls. If the Sunday letter is the same as that which is in a line with the date of the full moon, as it happened in 1562, Easter Sunday will be seven days after, as the coincidence of the Sunday letter and the date of the full moon in the same line shows that the full moon of the calendar falls on a Sunday.

Oold. Num.	Days of the Month.	Sun. Let.	Gold. Num.	Days of the Mouth.	Sun. Let.
14 3 11 19 8	March 21 ,, 22 ,, 23 ,, 24 ,, 425 ,, 26 ,, 27 ,, 28 ,, 28	CDEFGABOD	15 4  12 1 1	April 8 9 10 11 12 12 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	A B C D E F G
13 2 10 18 7	30 31 April 1 2 33 34 4 35 6 37	EFGABODEF	17 6   	,, 17 ,, 18 ,, 19 ,, 20 ,, 21 ,, 22 ,, 25 ,, 25	B C D E F G A B

To explain the manuer in which the above table is used, let it be required to find Easter Sunday for 1863. For this year the golden number is 2. The date in the this year the golden number is 2. The date in the wecond column, opposite the number 2, is April 2; this, then, is the day on which the moon of the calendar is supposed to be full. The Sunday letter for the year is D. Reckoning, then, from A, the letter in a line with the date of full moon, we proceed down the column antil we come to D for the first time, in a line with

which we find April 5 in the second column, the day on which Easter falls for the year in question. The above table is available in finding Easter for any year from 1700 to 1809 inclusive. To make it available for any year between 1900 and 2199 inclusive, every numany year between 1900 and 2109 inclusive, every number in the column of golden numbers must be shifted into the line immediately below it, except 17 and 6, which remain where they now are.—Ref. Companion to British Almanac, 1845; Eng. Cyc.—Arts and Sciences.

EASTER OFFERINGS, or EASTER DURS, are small sums commonly paid by each person when he receives the Lord's supper at Easter to the elergyman. They

are generally twopenee from every communicant, and are due of common right, and not by custom only.

EAST-INDIAN AEMY.—As the possessions of the East-India Company increased in India, it was found necessary to raise and maintain a body of troops to enable the Company to preserve its own by force of arms. At first a few Europeans, mostly men of despected for the contract of the company to preserve its own by force of arms. perate fortunes, under the command of some adventurer as reckless as themselves, garrisoned the forts that were erected for the protection of the merchants' fac-tories; but ere one hundred and fifty years had elapsed from the date of the grant of the first charter, these little bands of men had grown into regiments and armies. and the Company was actively engaged in carrying on wars with the French and many of the native princes. Liberal pay, ample furloughs, and pensions after serving for a certain period, formed attractions which brought the natives to the Company's standard. A system of organization was introduced, a few regiments of Europeans were enrolled and dispersed among the native forces; and in 1857, at the commencement of the Indian mutiny, the armies of the three presidencies,— Sudan mutary, the armies of the three presidencies,—
Bengal, Madras, and Bombay, amounted to about
280,000 troops of all arms of the service, including
18,000 European troops in the Company's pay and
about 24,000 of the queen's troops, who were also paid
by the Company while in India. Besides these, there
were large contingents furnished and maintained by were large contingents furnished and maintained by the native princes under British protection. Since the close of the mutiny, the power of the Company has passed into the hands of the Crown, and the European portion of the Company's troops has been amalgamated with the British army. (See Army.) The native por-tion has been entirely reorganized, and is quite as nu-merous as it was before the commencement of the outbreak, but perhaps more efficient and more under the control of its officers.

EAU DH COLOGNE, o-de(r)-ko-lone' (Fr., Cologne-water), a perfumed spirit, originally manufactured at the town of Cologne, in France, and generally used as a perfume, although several imaginary medical virtues

a pertune, a mough several magnary medical virtues in popular belief are attached to it.

EAVE, eecc (Sax. yfee), in Arch., that portion of the roof which projects over and beyond the face of a wall, to carry off the rain and prevent it from trickling down

its surface and rendering it damp.

EAVESDEOF, eevz'-drop (Lat. stillicidium), is the water which drops from the caves or roof of a building, or the space left outside the walls of a house for the rainwater to escape. Among the Romans, unless a man had a servitude of stillicidium over his neighbour's property, he was obliged to keep at a certain distance within his own in building; for no one was obliged to receive on his own property the water which fell from his neighbour's bouse. Laws to the same effect exist. receive on his own property the water which fell from his neighbour's house. Laws to the same effect exist in most modern countries. The space is commonly regulated by usage, and may be usually from a foot to a foot and a half on the several properties; but a propertieor may build as near his own boundary as he pleases, provided the rain descending from the roof fall within his own property, because in this way he is only making a natural use of what belongs to himself, without exceptions with a prighthouse weaponts.

EAVES-DEOFFESS (Ang.-Sax.), in Law, are such as to hearken under walls or windows, or the caves of houses, to hearken after discourse, and thereupon to frame slanderous or mischievous tales. Such persons are regarded as a common nuisance, and may be indicted at the quarter sessions, and punished by fine, and obliged to find sureties for their good behaviour.

Eng. eb (Sax. ebbe), the reflux or return of the tide towards the sea after high water; opposed to flood, or

## Ebenaces

Ecchymosis

EHERACEE, eb-en-ai'-se-s (from Arab. abnous, Lat. chenus, Sp. chano, ebony), in Bot., the Ebony fum., a nat. ord. of dicotyledonous plants, in the sub-class Corolliflora, consisting of about 160 species, mostly natives of tropical India. Character.—Trees or shrubs with alternate, entire coriaceous leaves, without sti-pules. Flowers, polygamous; calyx 3—7-parted, in-ferior, persistent; corolla 3—7-parted; stamous equal in number to the divisions of the corolla, or twice, or four times as many, and attached to the corolla, or hypogynous; anthers 2-celled, introrse, opening longi-tudinally; overy 3-12-celled, each cell with one or two ovules suspended from the apex; style usually having as many divisions as there are cells to the ovary. Fruit fleshy; seeds large, albuminous. Many of the Ebena-cea are remarkable for the hardness of their timber, which is known under the names of ebony and ironwood. Many species have edible fruits, and some have astringent barks. (See Diospynos.)

EBIONITES, eb'-e-o-nites (Heb. ebion, poor, low; used

by the Jews as a term of contempt), a sect of Jews who professed Christianity to a certain extent, and seem to have consisted of two different classes, the first of which was to be found in the Holy Land in the 1st and 2nd centuries of the Christian era; while the lat and 2nd centuries of the Christian era; while the second existed in Syria, especially in the neighbourhood of Bercea, at the latter end of the 4th century and the beginning of the 5th. The early Ebionites denied the divinity of our Saviour, believing him to be a mere man, the son of Joseph and Mary, but considering him to be the Messiah, allowing the truth of his resurrection from the dead, and looking for his second coming to restore the Jewish kingdom upon earth to a coming to restore the sewish ringdom upon earth to a greater state of splendour and power than it had ever hefore enjoyed. They seem to have been a moral sect, adhering to the Mosaic law. They acknowledged the scopel of St. Matthew only, but struck out all parts which related to the divinity of our Saviour. The later Ebionites were distinguished from these by allowing the supernatural birth of our Saviour, although they did not believe in his pre-existence as the second person of the Trinity. They also used the Gospel of St. Matthew, but rejected the Acts of the Apostles and the Epistles of St. Paul.

Ebonits, eb-o-nite (Lat. chemis, chony), a substance

Enonite, eb'-o-nile (Lat. ebenus, chony), a substance produced when caoutchoue is mixed with from two to ten per cent. of sulphur, and raised to a temperature of 270° to 300°. The caoutchoue undergoes a change, it acquires new characters, its elasticity is increased, and it becomes more equable. The ordinary solvents do not affect, nor does cold or heat alter, its general conditions. (See VULCANIE.)

EBONY. (See DIOSPYROS, EBENACE.E.)

EBULLITION, eb-ul-light-un (Lat. ebullifio, a bubbling un), the bubbling agitation of liquids after they have

up), the bubbling agitation of liquids after they have been heated to their boiling-points (which see). On gradually heating water in a glass flask by means of a spirit-lamp, we first observe the formation of minute air-bubbles, which dart through the liquid with great rapidity. As the temperature increases, these give place to larger bubbles, consisting of steam, which are formed at the bottom of the vessel, and which rise a little mar in the liquid and these gives the state of the stat little way in the liquid and then contract and disappear, producing a hissing or simmering sound. as the heating goes on these steam-bubbles rise higher and higher in the liquid, until at last they reach the surface and escape, when the liquid is said to be in a state of ebullition. The temperature at which the chullition of a liquid takes place varies with the pressure of the atmosphere. When the barometer stands at 30 inches, water begins to bubble at the temperature of 212° Fahr., because at this temperature the elastic force of steam will support thirty inches of mercury, and consequently the bubbles acquire the power of breaking through the surface of the heated liquid.

ECHALIUM, ek-bai'-le-um (Gr. ekballo, I cast out, ex-pel), in Bot., a gen. of plants belonging to the nat. ord. Cucurbitaceæ. The species E. officinarum is commonly called the squirting cucumber, from the fruit sepa rating, when ripe, from its stalk, and expelling its seed and juice with much violence. It is a native of the south of Europe, and is cultivated in England. The feculence deposited from the juice of the fruit, when dried, constitutes the drug called elaterium, or extract of elaterium, which is a powerful hydrogogue cathartic. It is given when pure in doses of from 1/2th to 1/2th of a grain. In improper doses it is an irritant poison. Elaterium owes its properties to a bitter principle, named elaterin.

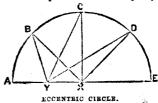
named etaterin.

ECCE HOMO, ek'-se ho'-mo (Lat., behold the man), a term in Art applied to those pictures which represent Christ wearing the crown of thorns, and bound ready for execution. Some of the greatest painters have employed their highest efforts upon this subject. The finest Ecce Homo in existence, without doubt, is that painted by Correggio, and now in the National Gallery in London. In this magnificent picture the noble features London. In this magnificent picture the mole features of the countenance of Christ express the utmost pain without being disfigured by it. The Virgin Mary is also represented, fainting in the arms of Mary Magdalene. The effect of the pale countenance of the Virgin is enhanced by the contrast of the dark blue clouk, which is drawn over her head like a veil. The picture has, however, suffered a little from cleaning and repairs. It is generally supposed to have been

and repairs. It is generally supposed to have been painted by Correggio at the age of twenty-six. ECCENTRIC, et-sen'-trik (Lat. eccentricus, from ex, from, and centrum, centre), in Mach., a sort of whoel, or revolving disc, in which the axis, or centre of motion discent expert engineers. tion, does not coincide with the geometrical centre. There are a great variety of eccentrics, and they are very useful in converting one kind of motion into another. By this means, continuous circular motion can be converted into alternating or intermitting rec-tilinear motion, or into curvilinear, but not rotary mo-tion. Eccentrics may be driven by straps or bands; the bands, however, require to be extremely elastic, or it is necessary to apply a stretching pulley or roller, which can be pressed against the strap by the action of a weight. By this means a uniform degree of ten-

sion is attained.

ECCENTRIC CINCLE According to the Ptolemaio system of astronomy, every heavenly body was supposed to move round the earth, as the centre of the universe, in a circular orbit, and at a uniform rate of speed. When it was found, however, that the appaspeed. When it was found, however, that the apparent orbits of the heavenly bodies were not circular, and that they moved through unequal spaces in equal times, they accounted for it by supposing that the earth was situated in a position which did not coincide with the centre of the orbits of the bodies that were revolving round it, and in this manner they attempted to reconcile the discrepancy between the apparent mo-tion of the sun and planets and the theory they had in-



vented with regard to them. Thus if AB, BC, CD, DE, represent equal portions of the orbit of any heavenly body moving in a circle, which portions are traversed by that body in equal periods of time, the motions which appear circular and uniform to an observer at X, the actual centre of its orbit, will not appear so to an observer at X, because the angles at X, which to an observer at 1, because the angles at 1, which the arcs subtend, are not equal, as is the case with the angles at X, which are subtended by the same arcs, and the heavenly body will consequently appear to the observer at Y to describe equal spaces in unequal times, and vice tersd. The orbit of a revolution of a heavenly body is therefore called an eccentric circle in the Bridgenic average heaven the earth round cle in the Ptolemaic system, because the earth, round which it revolves, must be considered to occupy a posi-

which it revoives, must be considered to occupy a posi-tion that is out of, or removed from, its centre. ECCHYMOSIS, ek-ke-mo'-sis (Gr. ek, out of: chumos, juice), in Surg., is a discoloration of the ekin, occa-sioned by the rupture of blood-vessels and extravasa-tion of blood, usually produced by fulls, blows, sprains, and the like. One of the most common examples of ecchymosis is a black eye. In general, the discolora-tion does not take place till some time after the recent

### Reclesiastes

of the injury; and if may usually be much diminished by the speedy and continued application of cold wet cloths to the part.

ECCLESIASTES, or THE PRECHEE, ek-kie-re-di-teer, is the name of one of the canonical books of the Old Testament, placed after Proverbe and before the Song Testament, placed after Proverbe and before the Song of Solomon. These names are a translation of the Hebrew title Echeleth, the former of the two being adopted from the Greek Boptuagint. There is no room to doubt the canonicity of this book. It has occupied a place in the Jewish canon from the earliest times, and has been universally received by the Christian church. From some passages in the Talmud, however, some seem to have questioned the expediency of ulacons it among the Scribtares that were read publications in a mong the Scribtares that were read publications in the Scribtares that were read public to the service of the placing it among the Scriptures that were read publicly, on account of its containing "words tending to heresy" and "words contradictory to sash other" According to tradition, this was among the Scriptures which were not allowed to be read by any one under the age of thirty. Numerous questions have been started regarding the authorship, date, design, and plan of this book. Many critics contend that it could not have been written by Solomon, which is the generally received opinion, on account of numerous foreign and modern words that occur in it. In favour, however, of the common opinion, there is the unqualified testimony of the book itself, the author speaking of himself as the son of David, king of Israel, and the greatest possessor of wealth and wisdom in Jerusalem. The long intercourse of Solomon, too, with the representatives of foreign natious, and his foreign wives, would necessarily lead to the introduction of numerical states. rous foreign words and phrases in his writings. The book is generally believed to have been written in his old age, after he had experienced all the pleasures and follies of life, and was able to testify to their being all vanity and veration of spirit. The plan and scope of the book are very obscure, and have given much trouble to commentators. Some have regarded it as a series the book are very obscure, saumers, so the commentators. Some have regarded it as a series of dialogues and disjointed narratives, rival poems, literary discussions, ethical aphorisms, and unfinished practical essays. The most plausible ground for regarding it as the work of a variety of authors arises from the frequency and abruptness of its transitions. and the apparent want of any fixed plan. The great theme of the book is the vanity of all earthly things and labours: with this it begins, and with this it closes. It is as far removed as possible from the character of a formal treatise,—being the confessions of a man of wide experience, of his searches after truth and happiness, of his many disappointments, and of his ultimate success. According to Dr. Davidson, the contents are comprehended in four discourses. The first discourse is filled with melancholy, doubt, and dissatisfaction. The course of cartly things is unalterably fixed, and consequently all our efforts to obtain happiness by the acquisition of wisdom and the pursuit of pleasure are unsatisfactory, leading to the conclusion that the object of life ought to be the enjoyment of the good things that are within our reach (chap. i., ii.). The eccond discourse begins with a description of the absolute dependence of man on a higher immutable Providence; that the cheerful, undisturbed enjoyment of life comes from the hand of God; and that it is vanity to suppose from the hand of God; and that it is vanity to suppose that man, though possessing wisdom, can procure it by his own efforts. Yet God, who has connected everything with time and circumstance, disposes of events rightly and well,—this very limitation to man's effort being intended, for the purpose of teaching him to fear God (iii. 1—v. 19). But it is the lot of many men not to enjoy the good things of life which they have acquived; and this idea, which is started in the close of the second discourse, becomes the leading subject of the third. Though the enjoyment of the possessions acquired through the favour of God is often thwated. acquired through the favour of God is often thwarted, man should endeavour to attain to the true and contented experience of life by cheerfully using the earthly things given him, exercising true wisdom, and avoiding the folly which is so common (vi.—viii. 15). In the fourth discourse, the mystery that it sometimes hap-pens to the righteous as to the wicked, and the reverse, is taken up, and the conclusion agriced as that s taken up, and the conclusion arrived at, that, since there is an overruling Providence whose ways we can-not fathom, nothing remains but to direct the view to a lighteous state of retribution hereafter, applying

## Ecclesisstical Commissioners

wisdom and the fear of God to the satisfying of the spirit. "Thus the true enjoyment of the good things of this life is recommended in connection with and in subservience to the fear of God, whose judgment will hereafter clear up all seeming irregularities, and re-ward the works of men as they deserve."

ECCLESIASTIC, OF ECCLESIASTICAL, ck-klo-se-de'-tik (Gr. ekklesia, the church), denotes something belonging to, or set apart for the church, in opposition to civil or secular, what pertains to the world. There are ecclesiastical things and persons; ecclesiastical law, jurisdiction, history, ceremonies, disciplins, &c. Ecclesiastical persons are those when experiences siastical persons are those whose functions consist in performing the service and maintaining the discipline

of the church.

ECCLESIASTICAL COMMISSIONERS.—In 1835 certain royal commissions were issued, directing certain persons therein named to consider the state of the several dioceses of England and Wales, with reference to the amount of their revenues and the more equal distribution of the episcopal duties; and also the state of the cathedral and collegiate churches, with a view to the suggestion of such improvements as might render them most conducive to the efficiency of the established church; and further, to devise the best mode of providing for the cure of souls, with special reference to the residence of the clergy in their benefices. These commissioners, comprising, among others, the English archishops and bishops and the chief members of the government, recommended various improvements in our ecclesisation system; in consequence of which act 6 & 7 Will. IV. c. 77, was passed, forming certain prelates and laymen of distinction into a body corporate, under the name of "The Ecclesiastical Commissioners for England," and empowering them to mature and submit to the queen in council such plans as might be best adapted to give effect to the recommendations of the commissioners. And it was enacted that such plans, when ratified by order in council, should have the force of law. The Ecclesiastical Commissioners have made numerous alterations in our ecclesiastical system, which have been embodied in orders in council. Among these are the crection of the new sees of Ripon and Manchester, and the union of the sees of Gloucester and Bristol; the augmenta-tion of the revenues of the smaller bishoprice from those of the larger, without prejudice to the rights of existing prelates; the suppression of numerous sizecures; the making better provision for the cure of populous parishes; and such like. The corporation, as originally constituted, consisted of thirteen members; of whom five were episcopal, viz., the two arch-bishops and the bishop of London ex officio, and two cosnops and the dishop of London exception, and two other bishops nominated by the crown; five exception members of the government; and three laymen, to be also appointed by the crown. In 1340 the constitution of the board was materially altered, and, besides the two archibishops and the five members of the government. ment, the corporation was made to include all the bishops of England and Wales, three deans, and six common law, equity, and ecclesiastical judges; together with eight permanent lay commissioners, six of whom are in the appointment of the grown and two in that of the archbishop of Canterbury. In 1850, by 13 & 14 Vict. c. 94, authority was given to appoint another board; viz., that of "The Church Estates Commis-sioners," consisting of these months to the sioners," consisting of three members to form the acting committee of the board, and to whom all matters acting committee of the board, and to whom all matters relative to the sale, purchase, management of lands, &c., are intrusted, and who are the responsible officers of the commission. The first and second of these commissioners are lay members of the church, appointed by her majesty by letters patent, during pleasure, the other being appointed by the archieshop of Canterbury. Five commissioners, two of whom must be Church Estates Commissioners, form a quorum of the general board; and in cases where the seal has to be affixed, two of the five must be members of the episcopal bench. The Church Estates Commissioners constitute, either The Church Estates Commissioners constitute, either per se or in combination with two other members of Ecclesiastical Commissioners appointed under seal annually by the board; a committee called "The Estates Committee." There are thus three boards, before one or other of which, according to the nature of the case, all matters must be brought for decision; vis., the

## **Ecclesisatical Corporations**

general board, the Estates Committee, and the Church Estates Commissioners. By 19 & 20 Viot. c. 55, all the duties, powers, and authorities of the Church-building Commissioners are transferred to the Ecclesiastical Commissioners. By 13 & 14 Viot. c. 94, the commissioners are required to lay an annual report before the secretary of state, to be by him submitted to parliament, of all their proceedings for the current year.

ECCLESIASTICAL COMPONATIONS are corporations the

ECCLESIASTICAL COMPOSATIONS are corporations the members of which are spiritual persons. They are either aggregate or sole; in the former case being composed of a number of persons, as the dean and chapter of a cathedral; in the latter, consisting only of one; as a bishop, rector, or vicar. By the law of England every holder of an ecclesiastical benefice is regarded as a corporation, the temporalities of which fall to his successors and do not descend to his breirs.

ECCLEMATICAL COURTS are courts in which the archbishops and bishops adjudicate upon matters pertaining to religion and the clergy. Although we have evidence that the higher orders of the olergy assisted in the national councils in the administration of jusin the national councils in the summission of the tice under the Saxon and Danish kings, yet it is clear that no separate ecclesiastical courts existed anterior to the Norman conquest. William I. gave forth a charter, whereby it was enacted that no lay tribunal should take cognizance of matters affecting the clergy or the church, and that no bishop should take cognior the church, and that no bishop should take cogni-sance of secular matters. According to Coke, these tribunsis judged and determined causes ecclesistical and spiritual; namely, blasphemy, apostasy from Christianity, heresies, schisms, rights of matrimony, divorces, reparation of churches, probate of testa-ments, &c. By an act of parliament which came into operation in January, 1958, the jurisdiction relating to the granting or revoking of wills and letters of admi-vitation was transferred to the Court of Probatenistration was transferred to the Court of Probate and by the act 20 & 21 Vict. c. 85, which created a total change in the law of divorce of England, the exclusive jurisdiction relative to matters matrimonial was transferred from the ecclesiastical courts to the Court formed from the ecclesisatical courts to the Court for Divorce and Matrimonial Causes. (See Divorce Court.) The total number of ecclesiastical courts in England and Wales is 372. (See Court of Peculiars, Consistory Court, Architecon's Court, and Court of Delegates, under art. Courts, and Abelies, Court of See also CONVOCATION.)

Ecclesiastical Law. (See Canon Law.)
Ecclesiastical Year. (See Year.)
Ecclesiasticus, or the Wisdom of Jesus the Son OF SIRSCH, ck-kle-ze-de-tik-us, is the name of an apo-cryphal book of the Old Testament, said to have been originally written in Syro-Chaldaic, by Jesus the son of Srach, a learned Jew; but the exact time in which he lived is uncertain. The book was translated into Greek, with an introduction by his grandson, probably about B.c. 130. It is destitute of any systematic arrangement, and consists chiefly of meditations and proverby relating to religion and the general conduct of life. Its general tone, however, is ethical rather than religious, in some measure resembling the book of Proverbs; and hence some have been bling the book of Proverbs; and hence some have been led to attribute it to Solomon. The sentiments are sometimes so profound and the style so highly poetical, that, according to Addison, "it would be regarded by our modern wits as one of the most shining tracts of morality that are extant, if it appeared under the name of Confucius or of any celebrated Greeian philosopher."

Excussions: "Excussions: "Acklessendlenie (Gr. ekklesia, the

ECCLESIOLOTZ, ek-kle-ze-oll-o-je (Gr. ekklesia, the church, and logos, a word or discourse), a term that is applied to the study of ecclesiastical architecture and ornament, as well as of the vestments and ceremonies belonging to the Anglo-Catholic church. It is s belonging to the Anglo-Catholic church. It is a branch of archeology. A journal is published monthly for the premotion of the science, named the Eccle-siologist, and there is an Ecclesiological Society, based on that which was formerly known as the Cambridge Camden Society. The leading manufacturers of church furniture and ecclesiastical decorations are Messrs. Cox & Son, of Southampton Street, Strand, who exhibited some beautiful specimens of fonts, lecturns, chandeliers, carved oak communion-tables, and stained glass windows, in the Industrial Exhibition of 1862.—Ref. Handbook of Enylish Ecolestology. Echo

ECURLON, eth'-lon(g) (Fr. échells, a ladder).—Bodies of treops are said to be formed in echelon when the front of each body is in a line parallel to the frents of the remainder, but the body itself occupies a position either to the rear of that which is immediately on its right, and in advance of that on its left, or vice versa, according as the movement which follows the formation is to be to the right or left. Each body has its front clear of that which is in advance of it, so that the whole can of that which is in advance of it, so that the woole can be brought into the same alignment by marching forward. It is used in attack and retreat, and especially by cavalry in charging the enemy's troops. It is also an easy and expeditions method of changing the front of a regiment drawn up in line and bringing it into a new position that is in an oblique direction to that which it has just quitted. The most simple illustration of this formation is the zigzag outline presented by a flight of stairs or steps; whence it derives its name.

ECHIDNA, or PORCUTINE ANT-RATER, e-kid'-nd (Gr.)

KOHIDNA, OF FORCUTHA ANT-RATER, c-k-at-ma (Gr., (Eckidma hystrix, Cuvier).—Of this family there are two species,—Eckidma hystrix, peculiar to New South Wales, and Eckidma setosa, chiefly found in Van Diemen's Land. They are of the same size, and, in general appearance, resemble the common hedgehop. They affect hilly countries, living in burrows, and feeding on insects, principally ants and termites, which they capture by the protrusion of their long viscous tongues; which latter organ, as in the case of the true ant-eaters, by an arrangement of longitudinal and annular muscles, is capable of being extended and contracted to a considerable extent. The head of the echidna is small; muzzle much elongated, and terminating in a little mouth, which is destitute of teeth, but furnished with several rows of small spines on the but furnished with several rows of small spines on the pulate, directed backwards. The logs are short and strong, and the feet all fornished with five toes, armed with powerful claws. With the aid of these latter, it can burrow with great rapidity, and when pursued, and not allowed sufficient time to bore a complete hiding in the earth, it enters itself so far as to expose only its prickly back to the threatened assault,

ECHINOCACIUS, c. ki-no-kāk'-tus (Gr. echinos, hedge-

ECHNOCACTUS, c-ki-no-kik'-tus (Gr. cchinos, hedge-hog; cactus, a spiny plant), in Bot., a gen. of plants belonging to the nat. ord. Cactacea. The stem in early globular, and is furrowed with longitudinal grooves, varying in number and depth. The flowers appear on the salient angles of the stem, in the centre of little tufts of bristles and spines. Many species of this genus are in cultivation as stove or greenhouse plants.

ECHINODERMATA, e-ki-no-der'-mai-ts (Gr. echinos, spine, and derma, skin), a chase of radiate animals, the highest in organization of that great division. They are characterized by possessing a well-organized skin, under which, or attached to it, are frequently found plates of solid matter constituting a kind of skeleton. They have a digestive and a vascular system, and a circular nervous system has been desystem, and a circular nervous system has been desystem, and a circular nervous system has been de-tected in many of the species. A muscular system is constantly present. The nutritive apparatus of the Echinodermata is very simple, presenting in most of the family a single oridice, destitute of teeth, in the centre of the lower surface of the body, performing the functions both of the mouth and anus; but in some presenting a digestive cavity, with an orifice for the evacuation of its contents, distinct from that by which the food is taken in. The muscular motion is generally present in these animals, but the organs of motion in them are various, the principal ones being the membranous tubes, which can be protruded at will through the ambulacral apertures, and which have been termed the feet. Whether or no the highest among the Echinodermata possess sight is not a settled matter. Among those who believe that they do, may be named Professors Ehrenberg and Forbes, and among those of a contrary opinion, Professor Rymer Jones. They are all marine animals, and are fairly represented by the star-fish, sea-urchin, and sea-cucumber.

ECHINUS, sk-i'-nus, in Arch, a mondding, sometimes called the ovolo or egg-shaped moulding. It consists of a series of oval hosses in a vertical position, projecting from the face of the moulding, and sometimes separated by a line, terminating in a triangular head, libra a horal semantic.

like a broad arrow. ECHO, ek'-o (Gr. echo, sound), a popular term applied to reflected sound. When sound from any origin

### Eclectics

is propagated through the elastic medium of the atmosphere, undulations, or waves, are produced in the air. When these waves come in contact with a the air. When these wares come in contact with a cliff, or wall, or other opposing surface, they are reflected like light or heat! When the sound is so reflected as to come back to the observer's ear, it is called an echo. In order that the echo may be heard at the place where the sound originated, it is necessary that the reflecting surface should be at right angles to a line drawn to the point where the observer stands. An obligan well though 50 the other or that it can be An oblique wall throws off the ceho so that it can be heard by others but not by the originator of the sound. The most perfect echoes come from surfaces that are either even or so curved as to be in the form of a concave mirror. This, however, is not necessary; for a very distinct echo is often returned from the edge of a wood. Sound travels at the rate of 1,125 feet in a second; consequently it is necessary, in order to obtain an echo, to be at least sixty-two feet from the reflectan early to be a teasy stay two teach from the feature ing surface, and it of a second must be allowed to elapse in order to distinguish the sound from the echo. When nearer than this distance, the echo blends with the original sound, thus making both indistinct. In many churches and public halls, where the principles of acoustics have not been considered, the multitudinous echoes drown the speaker's voice. distribution of sound in public buildings, so that the echoes may assist in strengthening the original sound, is a subject of great importance. An ingenious elergyman at Cambridge invented a parabolic reflector, which had the effect of stunning him while he preached, however impartially the subject of his discourse was imparted to his congregation. When several objects reflect sound, the number of echoes is multiplied, the sounds growing weaker and weaker till they die away. sounds growing weater and weater the they dreaway. In order to produce many sounds, the reflecting plane must be at a considerable distance. At Woodstock there is an echo which repeats about twenty syllables, and the Swiss mountaineers sing their sougs, and especially the Ranz des Vaches, in such a manner that the echo forms an accompaniment to the air. number of syllables that an echo will repeat depends of course on the distance of the reflecting surface from the origin of the sound. At the tomb of Metella, in the origin of the sound. At the tomb of Metella, in the Campagna, near Rome, there is an echo, which, according to Gassendi, is able to repeat an hexameter line requiring 2½ seconds to utter it. The Echoes of Killarney are celebrated, and also those of some of the Welsh lakes. Near Milan, there is an echo which repeats the report of a pistol sixty times.

ECLECTICS, ek-lek-tikk (Gr. eklep, I choose or sections are the control of the pistol sixty times.

is a name given to such philosophers as, without attaching themselves to any particular system, or forming one of their own, professed to select from the various existing systems what they believe to be true, and thus to construct a new and complete whole. The name originated with the Alexandrian philosophers, or name originated with the Alexandrian philosophers, or Neo-Platonists, who professed to gather and unite into one body whatever was true in all the systems of philosophy. The chief representatives of this school are Plotinus, Porphyry, Iamblichus, Proclus, and Clemens Alexandrinus. Modern celecticism is considered to have taken its rise in the 17th century with Bacon and Des Cartes, but it has recently received a fresh impetus themselve the laboure of the Genran philosopher Placel. through the labours of the German philosopher Hegel. In the present day the most eminent supporter of this system is Victor Cousin.

RCLIPSE, e-klips' (Gr. ekleipsis), in Astron., the entire or partial obscuration of a heavenly body; which may be caused in two ways,—either by another body passing between it and the sun from which it derives its light, as in the case of an eclipse of the moon, when the earth passes between the sun and moon, or by the passage of a body between that which is eclipsed and the earth, as in an eclipse of the sun, when the moon passes between the sun and the earth. The eclipses which happen most commonly from the first-named cause are those of the moon (see Luxan Ecursus), the partial eclipse of Jupiter by the passage of one of its satellites between it and the sun, and the eclipses of the satellites of that planet (see JUPITER); while those which are occasioned by the second cause are eclipses of the sun by the moon pass-

## Ecole Polytechnique

occultation of a fixed star by the moon. (See MERCURY. occulation of a fixed star by the moon. (See MINGURY, MOON, VRUES.) Eclipses of Jupiter and his satellites can also happen through the second cause as well as through the first. Eclipses of the sun and moon, like the appearance of comets, were generally regarded by the ancients as omens of some terrible public calamity that was about to happen; and although the theory of eclipses is said to have been known to the theory of eclipses is said to have been known to the Chinese about 150 B.c., yet to this day the lower orders in China imagine that these phenomena are caused by the attempts of a dragon to devour the sun or moon, and they assemble with drums and other instruments, believing that the noise they make has the effect of alarming the dragon, and preventing him from making his anticipated meal. The first scippe that is placed on record is one of the most observed at Matvice on record is one of the moon, observed at Babylon 721 B.C. Thales showed the true cause of lunar eclipses 721 B.C. Thates snowed the true cause of make copiese before 800 B.C.; but Calippus was the first who calculated their revolutions, about 275 years later. Among the most remarkable eclipses of the sun that are recorded in history, may be mentioned that which happened at the crucifixion of our Saviour, and those in 1191 and 1715, when the darkness was so great that the birds went to roost, and flowers closed their petals as at nightfall, and the stars shone brightly at midday. The theory of eclipses and the various phenomena that attend them are given in the articles to which reference has been made above, and all technical terms used in the description of an eclipse will be found under their proper headings. (See EMERSION, IMMERSION, PENUMBRA.)

ECLIPTIC, c-klip'-tik, in Astron., the great circle in which the sun appears to move; so called because the moon is always found to be in or near this circle at the time of an eclipse. The plane of the ecliptic has a mean inclination of 23° 50° to that of the equator. The angle of inclination varies to the extent of 5" or 6" in ten years. It is computed that the obliquity of the ecliptic varies between two extreme limits; namely, from 23° 53′ to 22° 54′, and that it takes about 8,500 years to effect the transition from one limit to another. The change in the angle of inclination arises from the attraction that Jupiter, Mars, and the other planets exercise on the earth. The inclination of the ecliptic exercise on the earth. The inclination of the ecliptic to the equator is said to have been first measured by Eratosthenes about 250 B.c. The ecliptic is divided into four quadrants or area of 200 each by the equince-Into four quadrants or area or area by the entimers tial points and solstices. (See Equinoxis, Solstices.)

These quadrants are subdivided into three area of 30° each, which are called the signs of the zodiac (see Signs of THE EQUIAC), and named from the constellations which happened to be found in each when the distribute of the goldinian of the constellations of the goldinian of the constellations. division ci the ecliptic was first made. These do not now coincide, although the names are still preserved. Astronomical calculations are made from that point of intersection of the equator and the ecliptic, which is the position of the sun in the heavens on March 21st, and which is known as the first point of Aries. (Sec ARTES.)

ECLOGUE, ek-log! (Gr. ektoge, a selection), denotes literally a selection of pieces out of various works, or a collection of the choice pieces of an author; but, from being a name given to the pastoral poems of Virgil, it has since come to be generally applied to that species of poetry. Some imagine the name ecloque to have been originally applied to such poems as were written in imitation of others, and that the ecloques of Virgil were so called as being imitations of the ldyls of Theoritus. The ecloques of Virgil are of various descriptions, only some of them having the true characteristics. racter of pastorals; others contain occasional poems on public and private events of the day, but slightly enveloped in the pastoral costume. The terms ecloque and idyl, in their primary signification, denote the same thing; but custom has made a difference between them, and appropriated the name of ecloque to pieces wherein shepherds are introduced speaking, and idyl to those written in a simple natural style, like the cologue, but without any shepherds in them.

ECOLE POLYTECHNIQUE, al' kole pol-e-tek -neek (Fr. école, school; Gr. polus, many, techne, an art), a military school established in Paris in 1798, under the name of Ecole Centrale de Travaux Publics, or central ing between it and the earth-see Solar Ecuiss, or the joing by Venus or Mercury crossing the sun's disc, or the joung men for the profession of arms and civil engi-

# Economy, Political

M. Lamblardie, director of the Ponts et Chaussées, which are under the control and superintendence of the government in France, and carried out by him with the aid of many eminent Frenchmen of that day. In the course of the following year a more extended course of military study was adopted. The pupils were distinguished by a uniform, and the name of the establishment was changed to the more comprehensive title of Ecole Polystenique, which it still bears, with the addition of the word Impériale, added in 1852. It has been frequently closed on account of the active part that the pupils have taken in the revolutions and has been frequenty closed on account of the active part that the pupils have taken in the revolutions and ementes that have happened in Paris since the com-mencement of the present century; but it has always been reopened as soon as order has been restored. Civilians are admitted between the ages of 16 and 20; but soldiers who have served two years in the army are eligible until 25. Pupils have to pass an examination in order to obtain admission. The course of study ex-tends over two years, when those who can pass the final examination are admitted into the engineers, artillery, civil engineers, or any employment of a similar nature under government.

ECONOMY, POLITICAL. (See POLITICAL ECONOMY.)

ECONOMY, ai-kor'-shai (Fr. écorcher, to skin or flay, from Lat. corium, a hide, or cortex, bark), the name given to a figure used by artists in the study of anatomy, in which the muscles are exposed to view by the removal of the outer skin. In parts of the figure the upper muscles are also removed, to exhibit those that he nearer the bone. These figures are made for the use of artists in plaster or papier maché. There are

also series of drawings which serve the same purpose, and in which the muscles of the human frame are represented from every point of view.

Restast, eks'-tä-se (tr. ekstasis, a standing out, change, or transposition), is a condition of mind in which the soul seems as if it were transported out of the body. The varieties of ecstasy are infinite, but they are all marked by an altered or diminished consciousness. The individual may be either completely passive or violently moved, and may or may not have any knowledge of what is going on around him. Sometimes he assumes the air of inspiration. This mental condition may be induced by fixing the mind too exclusively on one idea or object, so as to overlook all other sensations, as in meamorism and cortain forms of disease. It is also known in connection with certain highly religious states of mind. Among many Eastern nations this condition is cultivated as a part of their religion; and even among Christians there have been writers—as Bonaventurs, Gerson, and others—who have recommended those contemplations which may lead to costasy. People, however, are too apt to mis take the visions of a heated imagination for a higher

take the visions of a heated unagination for a higher and nearer view of spiritual things.

ECSTATICI, eks-tat'-e-si (Gr. ekstatikoi, from existemi, I am entranced), in Ant., were diviners who were cast into trances or cestasies, in which they lay as if dead, but who, on recovering their senses, gave strange revelations as to what they had seen and heard.

ECTOZOA, ek-to-zo'-d (Gr. ektos, without; zoos, living), a term applied to those parasitic animals, such as lice, ticks. &c., which live upon the external parts of other

ticks, &c., which live upon the external parts of other animals. The word is used in contradistinction to animals. The word is used in contrausement animals. Those entomostracous crustaceans which are entozou. Those entomostracous crustaceans which are parasitic upon fishes belong to the ectozos. It is a matter of dispute whether these parasites are the cause of disease, or whether they are the result of previous disease.

EDDA, ed'-dä, a term applied to several Scandinavian songs, supposed to have been collected and arranged by Semund Siguason, surnamed Frodi, an Icelandic priest, who was born between 1054 and 1057, and died in 1133. These songs were first discovered and brought to light in 1424 by Harniel Sandson history of States. in 1133. These songs were first discovered and brought to light in 1643, by Brynjolf Svendson, bishop of Skalbolt, who gave them the name of Edda, or 'grand-mother.' There are, however, two works which bear the title,—the "Edda Sæmundar hins Froda," or the Edda of Sæmund the Wise, and "Snorri Sturleson's Edda." Of these two eddas, the Sørmer is the most ancient, the date of its production being usually attributed to a period between the 6th and 8th centuries. Edda." Of these two eddas, the former is the most ancient, the date of its production being usually attributed to a period between the 6th and 6th centuries. The edda of Sæmund the Wise was published entire at With regard to the incisors, however, there is an ex-

## Edentata

Stockholm, in 1818, in 8vo. A complete edition of this edda was also published by Professor Munch, at Christianis, in 1847, and another in 1859, by Möbins. In 1851 a German edition of both eddas was produced by Simrook. Under the title of "Dreizehn Lieder in der Ursprache, mit einer doppelten Uebersetzung, &c.," the brothers Grimm have translated a part of Sæmund's adda. Snorri Sturleson's adda is a prose composition. edda. Snorri Sturieson's edda is a prose composition, and treats especially of Scandinavian mythology, and also of the language and literature of the ancient Scalds. In the first, or poetical edds, the detached poems attempt to shadow forth a religious system. Many of the poems have evidently been written before the in-troduction of Christianity; but the collection was pro-bably made after the Christian era. The belief in the destruction of the world is apparently derived from Christian sources; and in the very beginning of the edda the germs of one all-destroying catastrophe are presented, which involves not only the destruction of the universe, but also holds out the promise of a resurrection and a happier existence in an abode of bliss. The elder edda consists of thirty-seven poems of various degrees of poetical merit, all relating to Scandinavian mythology. The later edds is divided into two books,—"Gylfaginning," or the Fascination of Gylfa, a story similar to that of "Varthrudnismal," in the elder edds. edds. The second part of the later edds is called "Bragarsedhur," or the Discourse of Bragi, borrowed from the "Oegiradrocks," or the Drinking-feast of Oegir. In this part, Bragi, the Scald of the Gods, discourses upon the origin of poetry. (See SCANDINAVIAN MENTOCORY)

MYTHOLOGY.)

EDDY, ed'-de (Ang.-Sax.), a circular motion of the water, either in rivers or in the sea, but most frequently in the former. Eddies exist between the proper and the counter currents: they are caused by the edges of the one brushing against the other, or by a current running violently against a rock or an elevated shore, and in its recoil meeting some other object of impediment to its course; thus producing a circular motion of the water; the latter kind are often called whirlpools (which see).

Endwinder and are often caned windows (which see, Endwinder and a lighthouse in the English Channel, raised on a dangerous group of rocks that lie to the S.S.W. of Plymouth, and about 14 miles from the Breakwater, in lat. 50° 10′ 54′ N., and lon. 4° 15′ 53′ W. The lighthouse stands on the west side of the group. The Eddystone rocks were found so dangerous to homeward-bound vessels making for Plymouth harbour, that, in 1696, the Trinity Board resolved to erect a beacon on them. Mr. Winstanley, a gentleman of Essex and an ingenious mechanic, undertock the task, and in 1700 he had completed his building, a wooden structure on a stone base, and polygonal in form, which was swept from the rock in a terrific storm, Nov. 27, 1703, while the architect himself was there superintending some repairs. The next was commenced by Mr. Rudyard, a silk mercer, in 1706, and finished in 1709. It was circular in form, and, like Mr. Winstanley's, made of wood on a stone base, but 8 feet lower than his in height, being 92 feet in all. It stood uninjured by the weather until 1755, when it was destroyed by fire. In 1757 Mr. Smeaton commenced the present lighthouse, the base of which is formed of solid block of granite, dovetailed and clamped by irons to the rocks below and to each other; a solid bed of masonry is thus raised 13 feet above the highest point of the rock; here a passage is dertook the task, and in 1700 he had completed his above the highest point of the rock; here a passage is formed communicating with a circular stone staircase, which affords access to the lowest of the four chambers that are formed in the upper part of the building; the that are formed in the upper part of the building; the whole is surmounted by a lantern 24 feet in height, surrounded by a gallery. The tower is circular, being about 27 feet in diameter at highwater mark, and diminishing to 15 feet at the summit. It is 85 feet in height, including the lantern. Mr. Smeaton is said to have derived the idea of its form from that of the trunk of an oak-tree. The upper part was originally made of wood, but it was burnt in 1770, and reconstructed of stone in 1774. The light is fixed, and may be seen shining over the waters at the distance of thirsteen or fourteen miles. teen or fourteen miles.

## Edinburgh University

ception to the rule in the case of the armadillo (Daspus setosus), in which a single tooth is found in each intermaxillary bone, but placed so completely at the sides of these bones, that the front of the mouth is quite destitute of teeth. Chrier observes, that, "alquite destruite of teeth. Onvier observes, that, "although brought together by a purely negative character, the edentata have, nevertheless, some positive mutual relations, particularly in the great claws which encompass the ends of their toes, and which more or less approximate to the nature of hoofs; also in a certain slowness, or want of neithy deviceds slowness, or want of agility, deviously arising from the peculiar organization of their limbs." The number of existing edentata is not nearly so great nor so gigantic in size as at a remote period of the world's history, as the remains of these gigantic herbivora, the

mylodon, megatherium, and the megalony testify.

EDICT, e'-dikt (Lat. edice, I proclaim or publish), is something that is given forth, or proclaimed, by comsomething that is given forth, or proclaimed, by com-petent authority, as a rule of action, more particularly an order, or ordinance, issued by a prince to his sub-jects, to serve as alaw. Strictly speaking, or in this latter sense, edicts cannot exist in Britain, as the enacting of law is not lodged in the king, but in the parliament. In ancient Rome, the ordinances of the magistrates, but particularly of the two prætors, were called edicts. From the uncertainty of the law at that early neriod, it was the custom of the prætors. called edicts. From the uncertainty of the law at that early period, it was the custom of the prætors, on their necession to office, to publish edicts, or rules, for regulating the practice of their courts, and the governors of the provinces had the same authority in their districts as the prætors in the city. The edicts of a preceding prætor were not binding upon his successor, unless he confirmed them; in which case they were styled edict: vetera, or tralatitie, in contradistinction to those issued by himself, which were called edicta nowa. By the Cornelian law (n.c. 56), the prætor of the year was compelled to adhere to the spirit tor of the year was compelled to adhere to the spirit tor of the year was compelled to adhere to the spirit and letter of his first proclamation. In the reign of Hadrian, the practor Salvius Julianus, an eminent lawyer, made a digest of the bost of the practorial edicts from the earliest times, which was ratified by the emperor and senate, and ordained to be always considered as law. By this edictum perpetuum, or perpetual edict, the standard of civil jurisprudence was at length fixed. From that time the power of making edicits was taken from the magistrates, and was at length fixed. From that there have now to making edicits was taken from the magistrates, and vested in the emperors. The celebrated edict of Milan was issued by the emperor Constantine after the conquest of Italy (A.D. 313), and granted to the Christians and others full liberty in the exercise of their religious duties. The edict of Nantes was issued by Henry IV. of France in 1598, granting religious freedom to his Protestant subjects, but was revoked by Louis XIV in 1685. In France, the term edict (édil) has a very wide signification, being applied to every proclamation of the government, of whatever kind.

Entotal Citation, e-dik'-til, by the law of Scot-

land, is the mode of citing before a civil court, one who has no fixed domicile in the country, and cannot be totad personally,—a foreigner, or one who is abroad. Formerly, in such a case, the citation was published at the market-cross of Edinburgh, and pier and shore of Leith; but by 6 Geo. IV. c. 120, and 13 & 14 Vict. c. 36, this is now done by the delivery of copies of the office of Edinth (Citations in the Delivery between at the office of Edictal Citations in the Register-house, Edinburgh, where they are preserved for three years, and abstracts of them published every fortnight.

EDINBURGE REVIEW. (See REVIEW.)

EDIMETER UNIVERSITY WAS founded in 1583 by royal charter, granted by James VI.; and hence it is styled "Academia Jacobi Regia," "King James's College," and "King's College." The lord provost, magistrates, and town council of Edinburgh, were constituted patrons and governors of the princestry. In trates, and town council of Estato and, we taked patrons and governors of the university. In 1621 an act was passed by the Scottish parliament which ratified to this university, in ample form, all the rights, immunities, and privileges enjoyed by the other universities in the kingdom; and this ratification was removed in the treaty of union between England and Scotland, and in the Act of Security. In the beginning of the 17th century, the business of the university was conducted by a principal, who was also the professor of theology, and four regents, who conducted the youth through the course of study secessary to obtaining a degree in arts. Each regent conducted his students

through the entire course, teaching them in succession logio, ethics, and physics, with the kindred diterary and mathematical studies. In 1642 the chair of Hebrew was instituted, in 1874 that of mathematics, in 1890 that of Greek, and in 1695 that of church history. In 1708 the present professorial arrangement in the faculty of arts was substituted for the previous regent-tutors system. The first professor of medicine was appointed in 1665; and in 1707 the foundation of the faculty of law was laid by the institution of a shair of public law was laid by the institution of a chair of public law was laid by the institution of a casir is pointed law, followed in a few years by chairs of civil and Scotch law. Since that time a number of new chairs have been added to all the faculties. From its founda-tion, in 1582, until 1858, the government of the univer-aity was in the hands of the magistrates and town council of Edinburgh; but it was taken from them by an act of parliament in 1855, and placed in the Senatus Academicus and the University Court, in connection with a general university council. The patronage of those chairs, which had been previously in the gift of the town council, was by the same act transferred to seven curators,—three nominated by the University Court and four by the town council, and hold office for three years. The offices of changellor, vice-chancellor, and rector were also instituted. The chancellor is the official head of the university, is elected by the general council, and holds office for life. The vice-chancellor is nominated by the chancellor, and performs his duties in his absence. The rector is elected by a general poll of the matriculated students of the university. president of the University Court, and holds office for three years. The University Court is composed of the rector, principal, the lord-provest of Edinburgh for the time being, and five assessors, elected respectively by the chancellor, the rector, the town council of Edinburgh, the general council, and the senatus. The rector and his assessor continue in office for three years, the other assessors for four. It constitutes the court of appeal from the Senstus Academicus, and has the power to effect improvements in the internal arrangements of the university, after due consideration with the sens-tus and council, and with the sanction of the chancel-The principal is resident head of the college and president of the senatus. He is appointed by the cura-tors, and holds office for life. The principal and pro-fessors constitute the Senatus Academicus, which is intrusted with the superintendence and regulation of the teaching and discipline of the university, and with the administration of its revenues and property. general council of the university consists of the chancellor, rector, and other members of the University Court, the principal and professors, masters of arts of the university, doctors of medicine of the university who have, as matriculated students, attended classes in any of the facuties for four complete sessions, and all who have established, within three years of the passing of the Universities Act (2nd August, 1858), that they had attended the university as matriculated students and attended the university as matriculated students for four essions, or three sessions and afourth in some other Scottish university. The number of members of the general council at present (1871) is 2,255. They meet twice a year, in April and October, to take into consideration all questions affecting the well-being and prosperity of the university, their decisions being represented to the University Court who executed that University Court who executed the transmitter Court when the transmitter Court who executed the transmitter Court when the transmitter Court who executed the transmitter Court when the t sented to the University Court, who are to return a judg-ment thereon. The chairs of the university are comprehended in the four faculties, the affairs of each faculty hended in the four faculties, the affairs of each faculty being superintended by a dean, who is elected by the professors of the faculty. The faculty of arts comprehends the chairs of humanity, Greek, matternaties, logic and metaphysics, moral philosophy, natural philosophy and rhetoric, and English literature; also universal history, practical astronomy, agriculture, music, and Sanskrit; attendance on the first seven of which is required for the degree of master of arts. The faculty of theology has plained and district the faculty of the control of district the faculty of the degree of master of arts. the degree of master of arts. The faculty of theology has chairs of divinity, Hebrew, eccleaisatical history, and biblical criticism and antiquities. The faculty of law has chairs of public law, civil or Roman law, and conveyancing. The medical faculty comprehends chairs of botany, institutes of medicine, practice of physic, anatomy, chemietry, midwifery, natural history, materia medica, clinical surgery, medical jurispradence, surgery, and general pathology. There are two secons in the year,—the winter seesion, which opens in the beginning of November and ends with April, and

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the summer session, which opens in the beginning of May and ends with July, the latter being almost entirely confined to the medical classes. The ordisery course of study necessary for the degree of M.A. ex-tends over four winter sessions; and candidates for that degree must be examined on all the seven subjects of instruction embraced in the above course of study; of instruction subreced in the above course or succey; and the examinations way be conducted partly in writing and partly vied voce. Students who have passed satisfactorily the examinations for M.A. may, before taking the degree, offer themselves for a further examination, with a view to graduation with homours. There are four departments for honours; viz., classical literature, mental philosophy, mathematics, and natural science, in any one or more of which students may present themselves for examination. Each student has to pay unusually a matriculation fee of £1. 1s.; and the fees for each class per session vary from £2. 2s. to £4. 4s. A fee of £3. 3s. is payable for the examinations for M.A. There are three medical degrees conferred for M.A. There are three medical degrees conterred by the university; viz., bachelor of medicine (M.B.), master in surgery (C.M.), and dector of medicine (M.D.). No one is admitted to the degree of M.B. or C.M. who has not been engaged in medical and surgical studies for four years, one of which must be at the university of Edinburgh. He must produce certificates of having attended certain classes, and the medical and surgical practice of a general hospital; and he is also subjected to examination, both in writing and vird wae, on the various branches of study. The degree of M.D. may be conferred on any candidate who has obtained the degree of M.B. and is of the age of 24, provided he has been engaged for at least two years in attendance on an hospital, or in practice. The degrees of D.D. and LL.D. are honorary distinctions. The professors of humanity, Greek, mathematics, natural philosophy, chemistry, and music, have each an assistaut, the first four having salaries of £100 each, the last two of £200 each. Conjoined with the professors as examiners for degrees, are three examiners in arts and three in medicine. The total number of scholarships and bursaries connected with the university is 112, and the annual value is about £1,800. They are mostly for the faculties of arts and theology, are generally of small amount, and in the patronage of the senstus, The total town council, or of private individuals. The total numbers of students in the winter session of 1861-62 was 1,427; being in arts 618, medicine 516, law 202, theology 01. The university library contains about 130,000 printed volumes, and above 700 MSS., many of which are of great interest and value. It originated in a bequest of about 300 volumes in 1580, and was subsequently largely augmented by donations from various persons; among others by the celebrated Drummond of Hawthornden, who bequesthed his library to it. It was formerly entitled to a copy of every book entered in Stationers' Hall, in lieu of which privilege it now receives a sum of £575 per annum. The museum of natural history was catablished in 1812, —a great part of it having been collected by the exer-tions of the late Professor Jameson. It receives a government grant of £200 per annum. The anatomical museum was founded in 1800 by Dr. Monro Secundus, who presented his own anatomical collection and that of his father to the university, for the purpose of "demonstrating to the students the structure, physiciogy, and diseases of the human body." The Royal Botanic Garden in connection with the university was founded in 1670, and extends to seventeen acres, having an extensive range of greenhouses and hothouses, with a large palm-house. There are also several private

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sterectyped, and to print copies as may be required from the sterectype plates. In a bibliographical point of view, some editions of books are much more valuable than others. Generally speaking, the last edition of an author's work is the best, as containing his latest improvements; but in some cases circumstances give a provements; but in some cases circumstances give as greater value to earlier editions, or sometimes the first. Sometimes a book acquires its chief value from the editor, or even from the publisher; as Bentley's Horace, or the Aldine Classics. (See BIBLIOGRAFILY, BOOK-TRADE.)

EDITOR, ed-it-or (Lat. edo, I publish), is one who edits or prepares for publication the writings of another. We may distinguish two classes of editors:—1. those whose object is merely to reproduce the works of another in their purity, and content themselves with adding notes or commentaries to the text; and 2. those who have the general superintendence of some large literary work, encyclopædia, magazine, newspaper, or the like, receiving contributions from various persons, which they may have to correct, cut down, supplement, or reject, according to their character and the ment, or reject, according to their character and the general plan of the work. In the former case the editor requires to be a man of great learning, taste, judgment, and exactness, and to have a full appreciation of his author, having to judge critically of the various readings, to explain the obscure passages, supply omissions and references, and generally to present his author in the most pure and favourable light to the noble. It at he latter case the qualifications require to public. In the latter case the qualifications require to be of a much more general and varied kind. Here a full and comprehensive view of the whole work is required, as well as an acquaintance with all its minor details, and the bearings of each upon the whole. Generally, a minute and accurate knowledge is necessary on a vast variety of subjects, and a readiness and full command over them, so as at once to be able to

bring them to bear upon any particular point.

Education, ed-u-kai-shun (in Lat. educatio is derived from the verb educo, I lead, or bring our or forth). The Latins used the word not only in relation to man, but also to the lower animals, and even to plants. To but also to the lower animals, and even to plants. To educate was to cultivate or bring out their various properties. With us, the term is properly confined to the human species, as being alone capable of education in any high or proper sense of the word. Man, says Kant (Veber Erziehing), is the only creature capable of cducation. The lower animals require, at most, only nourishment and protection to enable them to reach their proper condition, and to perform all the functions of their nature; but man is possessed of powers and faculties indefinitely perfectible, and which require to be trained and directed by others; otherwise they may be useless, if not absolutely injurious. In this way has Providence wisely provided for the progress of the human race. While the lower animals of to-day are not a whit more advanced than animals of to-day are not a whit more advanced than when they were originally created, man has been gradually progressing towards a higher and more per-fect state of development, and that exactly in propertion as the true principles of his nature were understood and acted upon. Each generation profits by the learning and experience of those that preceded it, and in like manner transmits its knowledge to its successors. Education, in its most extended sense, then, has to do with the progress of the human race towards a more perfect state of development. It marks its gradual advancement from the earliest dawn of history to the present time, observing the various circumstances that may have tended to promote or retard its an extensive range of greenhouses and hothouses, with a large palm-house. There are also several private museums or collections in connection with some of the classes.—Ref. Edinburgh Viviversity Calendur, 1871.

Enimon, edinh'un (Lat. edo, I give out or publish), is the number of copies of a work that are printed at one time before the types are again taken down by the may constitute an edition are hence very various, depending in a great measure tipon the sale which is expected to have a large or continued sale, to get it stances that may have tended to promote or retard its progress, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present, and seeks to gather from the whole instruction for the present in present.

It is a present man as an individual destined for a future and higher state of existence, for which lise the preparatory training. In this sense a man is educated, either for good or evil, by everything which he may respect the whole instruction for the present and bigher state of existence, from the oradle to the grave. In a still active for good or

the training which he then receives marks his character through life. While we shall be obliged, in the present article, to confine our attention to the last of these, as embracing the most important period of life these, as emurating the most important period of me as regards education; yet it is only by keeping in view that our entire life here is but a preparation for another and a higher state of existence, and that all our training must be directed to that object, that we can arrive at clear and correct notions respecting it. Education, then, we would define to be the full and harmonious development of all the powers and capacities of man,—full, that is, each to the highest point of which it is capable; and harmonious, each in complete unison with all the rest. In other words, it is the bringing of his entire nature into the highest is the bringing of his entire nature into the highest state of perfection of which it is susceptible; for, in the words of Milton, the end of education is "to repair the ruins of our first parents,"—to re-store harmony and beauty and power to that sys-tem which was ruined by the Fall. It is a common error to confound education with instruction, and much misunderstanding is the consequence. can be indeed no education without some instruction, but there may be a great amount of instruction with very little education. The best educated man is not he that knows most, but he that can do most. Bacon has well said that men are apt to set too high a value upon their acquirements and to underrate their faculties. It is impossible, from the nature of the present work, that we can traverse the vast field that the subject of education opens up to us, or notice the numerous important questions that are connected with it; and perhaps we shall best employ our space by noticing some of the more important points which are as yet but little understood or acted upon. In order to educate a human being, it is first of all necessary to know something of the nature of that being; for education can be right or true only in proportion as it is based upon a knowledge of that nature, and of the laws to which it is subject. Until a knowledge of human nature is more generally diffused and acted upon, we have little hope for any great progress in education. Man is not only subject to certain laws regulating his growth and determining his condition, but he is also possessed of a variety of faculties, differ-ing greatly in their nature and character, having different periods of development, and requiring different modes of treatment. It is only by extending our knowledge of these, that we can expect to arrive at a true system of education, which has for its object their full and harmonious development. The true educator carefully observes the workings of Nature, and pursues the course that she indicates, aiding her in her opera-tions, and, it may be, occasionally gently bending her to his ends, but never directly opposing or thwarting her, for he knows that she ever worketh wisely and well. Man, then, is possessed of a twofold nature,—a spiritual and a material; the one partaking of the nature of spirit, the other subject to the laws of matter. "The soul is that side of our nature which is in relation with the Infinite." "By this immortal soul," says Dr. Carpenter, in his Human Physiology, "man is connected with that higher order of being in which Intelligence exists, unrestrained in its exercise by the imperfections of that corporeal mechanism through which it here operates." It is unnecessary for our present purpose to attempt to speculate as to the nature of either spiritor matter apart and by itself. In man we have to do with the two in inseparable connection; and it is only with man that education connection; and it is only win man that caucation con-cerns itself. But not only are the two inseparably connected, but there is every reason to believe them to be inseparably present in every act. Physiologists, indeed, tell us, that as every movement of any part of the body causes destruction to a portion of the tissues of that part, so, in like manner, every thought that passes through the mind causes destruction to a por-

tendency of science in the present day is to break up tendency of science in an experience and partial man into pieces, viewing him as distinct and separate parts, instead of one beautiful and united whole. We believe that not only are spirit and matter inseparably connected in man, but that the former is everywhere limited by the latter; that the body is, in fact, the prison-house of the soul. Not only is there every reason to believe this to be the case from what is generally regarded as the nature of spirit, but we cannot nerally regarded as the state of spars, but we same otherwise account for the pari passu growth of the mind with the body,—its feebleness in childhood, its strength in manhood, and its decay in old age. Our rational soul, says Hippocrates, is always the same throughout the whole course of our life,—in youth and in age, when we are children and grown men; but the body, on the contrary, never continues in one state, but is constantly changing. It is only by bearing in mind the intimate connection that subsists between body and spirit, and the dependence of the latter upon the former for its manifestations, that we are able to explain many of the mental phenomena; and hence, too, we in many cases obtain a clue how to proceed in edu-cation. We thus come to know that the body and spirit in man are not two distinct and opposing elements, the one being improved and strengthened as the other is weakened and depressed. The two are indissolubly united,—the spirit giving life to the body, the body giving direction and form to the mind. And not only so, but our physical nature plays a much more important part in the animal economy than is generally believed or acted upon in education. The brain, which is the organ of the mind, is a part of our physical constitution, subject to physical laws, to disease and decay, requiring exercise to develop it, and a due supply of arterial blood to maintain it in a state of health. To the educator, too, it is important to know that he is not in the performance of his to know that he is not, in the performance of his duties, dealing with incomprehensible spirit moving in another sphere, and the laws of whose operations it is impossible for him to divine; but that the spirit is strictly limited, and subject to the laws of matter; that it is in obedience to these laws that its operations are carried on, and that, however mysterious some of are carried on, and that, however mysterious some or its workings may seem to be, they are all the result of causes which he ought to strive to find out. We see further here a valuable provision for the gradual improvement of the human race. It is well known that mental as well as physical quali-ties are transmitted from parents to children, however inexplicable the laws by which it is regulated may be at present, or how many apparent exceptions may occur. In our view, the general fact is explained by the physical character of the mind's organ; that, as the outward physical form is transmitted from parents to children, so is the physical character of the brain; and the man who has fought the good fight against his avil affections and lusts, and has kept the faith with his better nature, not only enjoys the fruits thereof himself, but may have the satisfaction of knowing that he may thereby be transmitting to his posterity the most valuable of all inheritances. "In order," says Sir B. Brodie, "to make the most of the intellectual powers, the animal system should be maintained in a state as nearly as possible approaching perfect health." "The state of mind, whether as regards the moral or the intellectual, is, to a very great extent, subjected to the influence of physical canees." But not only does this show the primary importance of physical health in education, but it leads ance of physical health in education, but it leads us to look for the like laws governing the mind as we know to govern the body. The great law in education, mental or physical, is exercise. If we want to develop a muscle, we exercise it; if we want to improve a faculty, we must, in like manner, exercise it. In the one case, as in the other, the exercise must be proportioned to the strength of the individual, and every period of exercise about the autocaded by a time every period of exercise should be succeeded by a time passes through the mind causes destruction to a portion of the nerve-matter of the brain. Thus every period of exercise should be succeeded by a time of rest. It is now the generally received opinion thought of the mind partakes of the material as well as the spiritual; as well as the material. This is of importance to bear in mind; for we constantly hear people speaking of mental acts and physical acts, as if the two were distinct and separate, and not intimately sonnected the one with the offer. In fact, the whole of rest. It is now the generally received opinion among philosophers and men of science, that different faculties of the mind have different portions of the brain for their organs; and hence it is that the mind, when tired of one subject, can turn with fresh vigour to another, in the tame way as one tired with walking may sit down to some manual occupation. We would, however continue the warren of practice the content of t

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from one kind of violent or protracted exercise to rom one kind of violent or protracted exercise to another; more particularly from severe mental to great physical exertion, or vice verad. The exercise of any part of the body causes an increased flow of nutritious blood to that part; and this continues for some time after the exercise has ceased, to supply the waste that has taken place; and hence to withdraw the blood at once in another direction by exercising other organs of the body, interferes with the regular course of nature. the body, interferes with the regular course of nature, and deprives the wasted part of its due nourishment. But while the two elements of man's nature are concerned in every act, some partake more of the one and others of the other; and hence we have the common division of them into physical and mental acts the former comprising the outward acts. tal acts, the former comprising the outward acts of the body, the latter mental thought and feeling; according to which we have a twofold division of education, into physical and mental. Of physical education, which deals with the proper development of the physical powers, it will not be necessary to say much. It is, indeed, a subject of the utmost importance, and entitled to much more attention than it has yet received, as it is not only upon it that the health of the body mainly depends, but it is by it that the hody is made the ready, willing, and obedient servant of the mind. Its object ought to be to impart strength, dignity, and grace to every movement of the body. The value of correct habits formed in early life, whether there were be useful secondlished as graceful. ther they may be useful accomplishments, a graceful deportment, correctness of pronunciation, or any kind of manual dexterity, continues to be felt throughout the course of one's life. As a means of physical education, course or one sine. As a means or paysical education, Ling's, or the Swedish, system of gynnastics is much superior to any other. It is not only founded on strictly physiological principles, but the attention of the pupil is excited and kept alive by his constantly iving direction from the teacher as to the different movements that he is to perform; and thus it is in some measure a mental as well as a physical exercise. It is also free from that violent exercion that characterizes the other systems of gymnastics. Mental education has to do with the mind of man, and ought to be based upon a knowledge of that portion of his nature. The mind is that which feels, thinks, and acts, or is characterized by feeling, thought, and action. The first of these comprises not only those feelings and impressions that are communicated through the senses, but also the emotions and moral feelings, and generally all such as arise from states of the mind itself. In thought, the mind turns itself in upon those feelings, reasons of them, judges of them, arranges and compare them. In the last of these we have the active printhem. In the last of these we have the active prin-ciples of the mind, or those that propel it into action; as the desires and the will. There are two kinds of actions; either passing outwards through the body, or inwards, directing the thoughts, calling up ideas, and forming conceptions. Here again we would caution against the error of regarding the mind as consisting against the error of regarding the mind as consisting of distinct and independent faculties, and not as one entire and united whole. "All our intellectual processes so completely interpenetrate each other, that it is impossible to separate them into distinct faculties and assign provinces to each."—(Morell's Psychology.) Feeling, thought, and action, therefore, are only different manifestations of the same active principle, and ought properly to go together. One of the great errors of the present assembles. In they are kept too much ought properly to go together. One of the great errors of the present systems is, that they are kept too much apart. Feelings are not so cultivated as to improve thought; and thought too frequently terminates in itself, without going out into action. The proper object of all thought and feeling is action, which is the great end of life. "A rigorous separation of the speculative from the practical," says Professor Fraser, the successor of Sir W. Hamilton in the chair of philosophy in Edinburgh, "is apt, by causing a disruption of the complex nature of man. . . to occasion weakness and vacillation in the conduct of life." Men fail not on much from not knowing what is right, as from so much from not knowing what is right, as from not acting up to their knowledge.—(See especially on this subject Foster's admirable essay on Decision of

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the moment than after mature consideration; not from acting blindly, but from following a truer guide than reason. But to explain this will lead to another important question connected with the phenomens of mind,—that is, to what extent are we conscious of the operations of the mind? This is a question that has not hitherto received much attention in this country. not interest received much attention in this country. The doctrine of unconscious perception, or latent thought, originated with Leibnitz, and from him has passed into the principal philosophical systems of modern Germany. It has received various names; as, latent or ultra-conscious thought, unconscious cerebration, reflex action of the brain, &c. This doctrine may be illustrated in many ways. A man, after puzzling over a difficult problem for a long time, and, unable to solve it, turns his attention to something else, and after a time, on returning to it again, he finds it all arranged and plain before him, although he is quite unconscious of having once thought of it in the interval. Certain conditions of the atmosphere produce lightness or depression of spirits, by means of impressions of which we are insensible; and the unpleasant dreams which result from indigestion are to be attributed to the same cause. We know, too, that beyond consciousness, there exist in the mind systems of knowledge of which there exist in the minu systems of anomaly states, and which are only revealed on extraordinary occasions; as delirium, madness, somnambulism, &c., Within this as delirium, madness, somnambulism, &c. Within this unexplored region exist the instincts and intuitions of our nature,—those innate principles of morality and beauty which seem to us so incomprehensible, guided and directed, it may be, by feelings of pleasure and pain. "There is a latent intelligence within us which pain. "There is a latent intelligence within us which works teleologically, apart from will, feeling, sensation, or any kind of consciousness whatever."—(Morell.) "I do not hesitate to maintain," says Sir William Hamilton, "that what we are conscious of is constructed out of what we are not conscious of; that our whole knowledge is in fact made up of the unknown and incognizable." It seems as if the mind might be compared to a dark cavern, into which consciousness, like a light at the mouth, cermits us only to look a like a light at the mouth, permits us only to look a little way. In the dark and unknown region beyond are stored up all our knowledge and all our experience; and here are carried on those wonderful mental pro-cesses which are only known to us by their results. The highest and most perfect of the mental operations are instinctive or unconscious. Genius in its higher forms is of this kind, being moved and guided by inner im-pulses little accountable to reason. Genius had sponpulses little accountable to reason. Genius had spontaneously produced great works before rules of criticism could be laid down; and her greatest works still are but little indebted to such helps. "What," says Göthe, in speaking of his works, "is in such cases termed invention, was with me spontaneous" ("Ich habe nie über das Denken gedacht"). "Wobserve with confidence," says Carlyle, "that the truly strong mind, view it as intellect, as morality, or under any other aspect, is nowise the mind acquainted with its strength; that here, as before, the sign of health is unconsciousness." "Here (underneath the region of consciousness, in its quiet mysterious depths, dwells what vital force is in us;—here, if aught is to be created, and not merely manufactured and communicated, must the work go on. Manufacture is intelligible, but trivial; creation on. Manufacture is intelligible, but trivial; creation is great, and cannot be understood." And this is true is great, and cannot be understood. And this is cute of the moral as well as the intellectual powers, the highest morality being also instinctive; for, as he says, "had we never sinued, we should have had no conscience." Policemen are necessary where rogues exist; but, were society perfect, there would be no rogues, and no need for policemen. Further, not only are the highest acts of the mind instinctive, but the tendency of all mental acts is to become so by practice. Acts of which the mind was at first painfully conscious, become gradually less so, until at length they may be performed quite unconsciously. Were calucators to perceive and act upon the principle that there is in human nature something above and Character.) One great means of imparting decision of the Character to children is to teach them unquestioningly and unhesitatingly to obey. Further, we believe that and unhesitatingly to obey. Further, we believe that earliest period of life that our instincts are most active if people were true to their feelings, they would generate and most success,—more especially as it is during the earliest period of life that our instincts are most active if people were true to their feelings, they would generate and most succeptible of improvement. Everything rally be found to act much more wisely on the spur of that there is in human nature something above and beyond reason, their labours would be crowned with more success,—more especially as it is during the earliest period of life that our instincts are most active and most susceptible of improvement. Everything

primary instincts of the child. If we observe nature, we shall find that early shildwood is pre-eminently the we shall that ward park and the speciments the time for imbibing knowledge. Who can estimate the amount of knowledge that a child acquires during the first few years of its life,—without effort, without anything but by the apoutaneous workings of its own mind? This knowledge, however, workings of its own mind? This knowledge, however, is entirely objective, being acquired from nature and life around it. This, then, is the period for perceptive teaching,—for storing the mind with objective knowledge. But during this time the child is not content with being merely the recipient of knowledge: true to its instincts, it soon begins to reproduce what it has acquired,—to imitate what it sees and hears, and to express what it feels. The power of seizing wird ideas of things—of complaints associating, and connecting of things,—of combining, associating, and connecting them with the appropriate words or signs, is now in the highest state of intensity. Nature, therefore, shows that in education "our principal aim at this time of life should be to furnish nutriment for the growth and expansion of the powers of inward reprerowth and expansion of the powers of instance of the sensition; that is, for strengthening the memory, training and regulating the imagination, giving full play to the laws of association, and producing the capacity of expressing ideas in clear, luminous, correct, and copious language. All these habits of mind can generally be acquired with great facility at this time of life, but if a control of life. of life; but, if neglected som, so difficult does the process of their education afterwards become, that it is a thousand chances to one whether they will ever be acquired to any degree of perfection at all."—(Morell.) As the reasoning faculties become more advanced and mature, these powers gradually degenerate. It is, therefore, of the greatest importance, not only that they be improved to the utmost during this period of life, but that nothing should be done to abridge it by prematurely developing the reasoning faculties. fortunately, however, this is the tendency of much of the teaching of the present day. The teacher, not content with receiving a correct answer to a question, must also have the reason why it is so. The less the child has to do with giving or receiving reasons at this time the better. Direct teaching is the best, and rules, or the application of them, should be as little resorted to as possible. Still more reprehensible is the practice of presenting to the child's mind both the right and the wrong at the same time; or, after receiving a correct answer, asking if he is sure it is not something else. It not only tends to loosen its hold in the child's mind, but to make him doubtful of his knowledge. "Spoil not," says Dr. Andrew Fuller, "thy memory "Spoil not," says Dr. Andrew Fuller, "thy memory by suspecting it. How canst thou find that true which thon wilt not trust." As in morals, the greatest injury you can do an innocent child is to suspect him; so in you can do an indocent could be to suspect mm; so in teaching, you cannot do a greater injury to a scholur than to make him suspect his knowledge. In questioning a boy, so as to bring out his knowledge, care ought to be taken to fellow only the natural order. If questioned on the subject of his reading, the questions should follow the order in which it was read and not taken at follow the order in which it was read, and not taken at random throughout the lesson, or, as is sometimes done, by proceeding from the end to the beginning. This is of more importance than it may at first seem; for there are certain laws of the mind, commonly known as the laws of association, according to which things are stored up in the memory and reproduced. One of these is, that things are reproduced in the order and with the associations that they were received, and an habitual departure from this order is destructive of one of the finest and most important laws of mind. It is in this way that one comes to acquire the style and an tas way that one comes to acquire the style and modes of thought of another, the thoughts flowing naturally in the same way, the ideas suggesting each other in the like order. In every process of thought or course of reasoning there is a certain natural order in which the ideas suggest and follow each other; and any interference with this order tends to introduce confusion, whoughts springing up that are not directly wanted, and the mind becoming erowded with irrelevant matters. As it may mechanical operation, the work goes on best when the materials are brought to hand as and in the order that they are required; so mand as and in the order that they are required; so in mental operations, the mind as the best when the thoughts and words are brought before it exactly in the order finit they are needed,—

when it is given them at the proper time what they shall say; and if people would give more beed to the instinctive portion of their nature, they would find that its workings were much more true and reliable than any resulting from reason. Reason is but to be regarded as supplementary to that higher portion of our nature,—intuition. In the words of an old philosophical nature,—intuition. In the words of an one participants divine, whose works are by no means so well known as they deserve, "Intuition is by far the must perfect and excellent way of knowledge." "Our intuition here, however, is so short-sighted, that if we knew no more than we can thus attain to, we should not have sight enough the words are in our increase through the word; so that our we can thus attain to, we should not have sight enough to direct us in our journey through the world; so that our feeble eye is assisted with the glass of reason,—natu-rally, indeed, a very good prospective, but which logic, and especially algebra, has improved into a telescope. Still its but an artificial way of seeing, and all art sup-poses and argues a defect in nature;" but "hereafter said especially an artificial way of seeing, and an artificial way of seeing, and argues a defect in nature;" but "hereafter we shall be so far from needing any logic to direct us in our reasoning, that we shall have but little need or use even of reason itself,"—(Norris's Reason and Fuith.) But reason is given to us, and is necessary for us here, and therefore requires cultivation. Though not the But reason is given to us, and is necessary for us here, and therefore requires cultivation. Though not the highest faculty of our nature, it is the most practical, and that which has the closest bearing upon the occupations and duties of life. It is defined by J. D. Morell to be "the co-ordinating power in relation to all our other intellectual processes,—as that which gives unity and solidarity to them, siding us at once in the pursuit of truth, and in adapting our lives to the state of things in which we exist."—(Psychology.) This faculty deals with the ceneral and the abstract; separates our deals with the general and the abstract; separates our knowledge into definite parts; arranges, classifies, and embodies it in accurate terms; expands it into formal propositions, and draws conclusions from one proposition to another. As the mental powers become some-what mature, then the main portion of our intellectual education should be directed to the regulation and development of this faculty by means of the higher branches of study,—logic, mathematics, science, and philosophy. We have said little of the means of eduphilosophy. We have said little of the meass of education, of what is to be taught, and the order in which it ought to be communicated; but this is the less necessary, as those who shall have intelligently followed us in the above remarks will be able in some measure to judge for themselves on these points. The great thing in each case is to follow Nature, pursuing the course that she points out; and, as a general rule, the order of the progress of the race is the order that ought to be followed in the education of the individual members of it. We may mention that Dr. Neil Arust has, in his Survey of Humos Progress, given a sketch of the various branches of knowledge in relation to the state of the s education In fine, then, the object of education is the full and harmonious development of all our faculties; the bringing our entire nature, physical, moral, and intellectual, into the highest state of perfection of which it is capable. Who can tell how high that is? So far as our present knowledge or experience goes, it So far as our present knowledge or experience goes, is indefinitely perfectible. However much we may see the physical, moral, and intellectual parts of man apart now, they are each and all necessary, in their respective spheres, to constitute a perfect man, whom we believe to be a thing of beauty, physically, morally, and intellectually. God has not in vain inmorally, and intellectually. God has not in vain instilled principles of beauty into the mind of man; and according to a fine expression of Kant's, which, however, is but an adaptation of one of the sublimest docever, is but an acaptation of one of the sublinest doc-trines of the Platonic philosophy,—that of ideas, there is in every man's mind the ideal of a perfect man. Beauty and goodness always go together; the one produces the other. A man's character is generally impressed upon his countenance; and hence there was truth, as well as wit, in Sidney Smith's remark of a man having all the ten commandments written on his forehead The culture of the moral feelings gives a benignant and loveable expression to the countenance; intellec-tuality stamps itself principally upon the forehead; while the general admiration which a fine figure and while the general admiration which a fine figure and manly bearing naturally excite, show that physical education must also play an important part in the forming of our perfect man. (See NATIONAL EDUCATION, SCHOOLS, SCHOOL BOLEDS, UNIVERSITIES.)
EDUCATION, MILITARY.—This term may be equally applied to the education given to candidates for com-

## Education, Technical

missions in the army, as well as to officers who have already served, or to the system adopted by govern-ment to afford instruction to soldiers and their children. Instruction in all the subjects most necessary for an officer to become acquainted with, combined for an officer to become acquainted with, combined with strict military discipline, is given to cadets or youths from 16 to 19 years of age at entrance, at the Cadets' College, Sandhurst; the Royal India Military College, Addiscombe; and the Royal Military Academy, Woolwich. (Sec Cadet, Military; Military Academy, Woolwich. (Sec Cadet, Military; Military Schools.) A college was also exablished at Richmond, known as Cavalry College, in 1867, under private control, to afford a fitting education to youths about to actes that branch of the service. Officers are about to enter that branch of the service. Officers are able to render themselves eligible for staff appointable to reader themselves slightle for stati appointments at Sandburst under recent regulations. (See STAFF COLLEGE.) The sons of deceased soldiers are brought up and educated at the Royal Military Asylum, Chelsea, better known as the Duke of York's School, as many being admitted annually, by selection, as the vacancies that occur and the resources of the establishvacuations allow. On leaving, they either enter the army or are apprenticed to learn some trade. For the improvement of the soldier, schoolmasters are attached to each regiment, and stationed at the various camps and depôts; and instruction is regularly given in the elementary branches of knowledge to such as desire it, combined with lectures on various scientific subjects. (See REGIMENTAL SCHOOLS.)

EDUCATION, TECHNICAL. (Sec TECHNICAL EDU-CATION.)

EDULORATION, e-dul-ko-rai'-shun (Fr. tdulcorer, to sweeten, purify).—In Chem., edulcoration is the work-ing of precipitates after filtration, to free them from any excess of precipitant or supernatant fluid. It is generally performed by means of a bottle containing two tubes, one drawn to a fine point and reaching to the bottom of the bottle, the other only entering the cork a few inches. By blowing down the latter tube, the water is forced out of the former in a fine stream.

BES, set (Sax. al), a fam. of fishes (Anguilla), belonging to the apodal section of the Malacopterygii. Their long and cylindrical bodies are covered by a thick and soft skin, in which the scales are so deeply imbedded as to be scarcely apparent. The gill orifices are very small, and are situated far back; so that there is a long eassage from the gill-chamber outwards; and hence passage from the ginemanner outside, see the the gills not soon becoming dry, these fishes can remain a long time out of the water, some of them, indeed, leaving it of their own accord. Most of the cels are included in the Linnman genus Murana, and are divided by some naturalists into the families Symbranchivided. de, Muranida, Anguillida, Congerida, and Ophicurida. The Synbranchida have the gill-passages so united under a common integument as to present externally only a single orifice: they are almost destitute of fins. The species are few, and they are chiefly found in tropical seas. The Muranida are also generally destitate of fins, or nearly so: they are all destitute of scales, and never found in fresh water. The Anguillida are fresh-water fishes, though some of them occasionally visit the sea. They have pretty large pectoral fine, anal and dorsal fine extending to and encompassing the tip of the tail, and numerous longish scales embedded in groups in the skin, so as to resemble latticework. Ophiswide, or snake-cels, are distinguished by the tail ending in a conical pointless fin. At least three species of cels are found in this country,—the Sharp-nosed, the Broad-nosed, and the Snig. The first-The firstmentioned, which is common in streams and lakes, is distinguished, as its name implies, by its comparatively long and narrow muzzle. Its colours are dark olive-green on the upper surface of the head and body; under surface silvery white. The clearer the stream in which the eel lives, the more vivid are its colours. The broadnosed cel is not uncommon, and is often found in the same waters with the sharp-nosed, from which, however, it is to be readily distinguished by the comparaever, it is to be readily distinguished by the compara-tively greater breadth of its head and the situation of its eyes, which are placed in advance of the angle of the mouth; the body, moreover, is thicker in propor-tion to its length, and the teeth more numerous and stronger; and the dersal and spal fins, which are much deeper and thicker, commence farther back. In some parts of England this sort is known as the grig-eel.

## Efforescence

The snig is in many respects intermediate between the hroad-nosed and sharp-nosed species: its colour is closely like that of the sharp-nosed cel. "In the compa-rative breadth of the nose," says Mr. Yarrell, "the snig is intermediate in reference to the broad and sharpnosed eets, but rather more resembles that with the nosed eas, but rather more resembles that with the sharp nose. It has a slight but elongated depression extending from the enterior edge of the upper jaw to the upper and back part of the head; the tubalar openings of the nostrils are longer, and the nucous pores about the lips larger and more conspicuous; both jaws rounded at their extremities, the lower one the longest; teeth longer and stronger than in the common sharpnosed species; gape large; the angle and the posterior edge of the eye on the same vertical line; the pectoral edge of the eye on the same vertical line; the pectoral fins, the commencement of the dorsal fin, and the vent, are each placed nearer the head than in either of our fresh-water eela." The snig is considered superior to other kinds for the table; but the sharped-nosed cel other kinds for the table; but the sharped-unsed eel attains the greatest size,—sometimes five-and-twenty, and even thirty pounds weight. The eel migrates at the approach of winter to warm estnaries, generally brackish, and at times perfectly salt. Those, however, which live in ponds, and cannot emigrate, bore down into the mud, and there remain during the colder months of the year. They are sometimes dup out of the mud, land to give a sometimes dup out of the mud, land to give a sometimes dup out of the mud-banks of rivers and lakes in considerable quantities. Mr. Yarrell mentions that the London market is supplied with eels by Dutch fishermen, from Holland. There are two companies in Holland, having five vessels each. Each ship is built with a capacious well, in which large quantities of cels are stored till they are wanted. Each vessel carries a cargo of this fish, weighing from fifteen to twenty thousand pounds, the duty on which cargo is £15.

the duty on whom cargo is 2.15.

Rel, Conger. (See Conger Erl.)

Erl, Electrical. (See Electrical Erl.)

Refrect, cf-felt (Int. effecre, to produce), in Paint.
and Sculp., a term used to express the impression that
correct drawing and judicious and harmonious coluring in a picture, or the outline and position of the figure or figures in a well-executed piece of sculpture, is apt to produce on the mind of the spectator. When is apt to produce on the mind of the spectator. we are looking at a work of art, and nothing incongru-ous or distorted in outline or design, or offensive to the eye in colouring, meets the view, we are prone to express our satisfaction with that at which we are look-

express our satisfaction with that at which were sooning by saying that the effect is very good or pleasing.

EFFECT, the impression produced on the ear and
the mind by the performance of good music. It is the
joint result of composition and performance; and is
the chief object of both the composer and the executant, on whose ability and skill it entirely depends.

EFFENDI, 'ef-fen'-de, among the Turks, a title of honour given to civil dignituries and others, in contradistinction to the title aga, which is only bestowed upon courtiers and military officials. The word is equivalent to the English sir, or the French monsieur.
Thus the minister of foreign affairs is called Refserfiendi; the first physician of the sultan is termed Hakim-effondi; the priest of the seraglio, Imameffendi, &c.

EFFERVESORUE, of fer-ves'-ens (Lat. effervesco, I boil over), in Chem., the escape of gas in musute bub-bles from a liquid. Thus, when any strong amaonis is uncorked, effervescence takes place, from the relief of pressure. It also happens when a gas is replaced in a solution by some liquid or solid, as where sulphuric acid is added to a solution of carbonate of sods to

acid is added to a solution of carbonate of soda to unite with the alkali, acting free the carbonic acid.

Effice, of feje (Lat. effigies, a likeness, from fueger, to make or form), the resemblance or likeness of any person executed in metal, stone, wood, plaster, &c., or depicted in a drawing or painting. Although it is generally taken to mean a likeness in any form or material, it is a word but seldem, if ever, used in the meterial, it is a word but seldem, if ever, used in the fine arts. It may be better applied to the rude representation of any one, such as those of Guy Fawkes, which were formerly carried about the streets on November 5, than to any portrait, bust, or statue.

Bepronscance, of fiother case (Lat. effloresce, I blossom).—In Chem., efflorescence is the formation of an opaque powder upon the surface of a crystal, from its losing its water of crystallization spontaneously, the action generally consinuing until the whole has fallen to

powder. Familiar instances take place in common carbonate of soda and sulphate of soda, or Glauber's sait. It is the reverse of deliquescences. Expressors, of further than (Lat. of two). from effundo, I pour out or forth), denotes generally the pouring out of any liquid, and is applied, in Med. to the scose of any fluid out of a vessel or viscus naturally containing it, and its lodgment in another cavity in the cellular substance, or in the substance of parts. It also some-times signifies an oosing or morbid secretion of a fluid from vessels that have not been ruptured; thus surgeons often speak of coagulable lymph being effused

on different surfaces.

E FLAT, the note E depressed half a tone,—the minor seventh of F, and the second flat introduced in modulating by fourths from the natural diatonic

scale mode.

EGG, eg (Sax. eg, Lat. ovum), a body produced in the females of birds and certain other animals, containing an embryo or fectus of the same species, or the substance from which a similar saimal is ultimately produced. Those animals in which reproduction takes place by means of eggs are called oviparous. The marsupial quadrupeds and the mono-tremata form the connecting link between the warm-blooded animals which are oviparous and the truly viriparous animals, which only belong to the mammalia. The number of eggs produced varies greatly in different animals; some birds only produce one egg in a year, while others produce as many as twenty. The roe of some fishes conbirds only produce one egg in a year, while others produce as many as twenty. The roe of some fishes contains myriads of eggs. The eggs deposited by some animals are enveloped in a gelatinous substance; others are connected in various ways, sometimes being in the form of a string. The eggs of a large number of birds are used as articles of food, those most generally used belonging to the class of birds called poultry. The common domestic fowl, the turkey, and the peahen, are birds whose eggs are most generally used all over the world. In some of the islands of Beetland. the eggs of several species of sea-birds, such as the gull and guillemot, form an important article of food gui and guillemot, form an important article of food among the inhabitants. Although the eggs of birds are principally eaten, the eggs of the turtle are also considered a luxury; and the eggs of fresh-water tor-toises are valuable for the oil which they yield. An ordinary hen's egg has an average weight of 875 grains, of which the shell and its inner membrapous coating weigh 37 grains; the albumen, or white, 529's grains; and the yolk 251'8 grains. The shell contains about two per cent. of animal matter, and one per cent. of the phosphates of lime and magnesia, the rest consisting of carbonate of lime, with a trace of carbonate of magnesis. (See Albumen.)

of magnesis. (See ALBUMEN.)

EGG-BPLES. (See SOLANUM.)

EGG-BIED (Hydrochelidon fuliginosum, or Sterna fuliginosu), a bird of the Gull fam, sometimes called the sooty tern. It is somewhat larger than the other members of the tern family, and has a long and sharp the south of the tern family, and has a long and sharp than the converged and algular wines. bill, nearly straight, compressed, and slender; wings narrow, long, and pointed; tail deeply forked; colour glossy black on the upper parts, edges of wings, fore-head, and under parts white. It abounds in the West-Indian seas, and is chiefly valuable for its eggs, which are about two inches long, cream-colour, sparingly streaked with purple. So highly are these eggs esteemed, that their gathering is quite a considerable trade. The nest of the egg-bird is made in the sand, and the eggs number from one to three.

and the eggs number from one to three.

Egg-Taple.—The trade in eggs forms no inconsiderable branch of our commercial intercourse with France, as the English poultry are not able to supply the home demand. Vast quantities of eggs are, howthe home demand. Vast quantities of eggs are, however, brought from the country to London and other ever, brought from the country to London and other largetowns. The importation of eggs from France gives employment to a large number of small vessels. In 1854 mentions a large number of small vessels. In 1854 mentions on a base that contracts in size as it appears to a large number of small vessels. In 1854 mentions on a base that contracts in size as it appears to a large number of small vessels. In 1854 mentions on a base that contracts in size as it approaches the floor of the building, instead of expanding from the substance of the sum of the shaft, as is usually the case. The capitals are sometimes bell-shaped and adorned with lotus-leaves, while others are square in form, with a human face sculptured on each from Beigium. The value of these eggs has been computed at £336,000. The imported eggs are seldom equal in quality to those

produced at home. The duty formerly paid on imported eggs is now removed.

ported eggs is now removed.

Reg-hatching. (Soe Hatching.)

EGYPTIAN ARCHITECTURE, e-fip'-shim.—The architecture of Egypt is the oldest in the world, and is superior to that of any other country, Assayris along excepted, in its colossal proportions, massive structure, general magnificence, and grandeur of conception. It has the merit of being entirely original, and possesses peculiar characteristics that distinguish it in a striking manner from that of any other country. The striking manner from that of any other country. The carliest specimens of Egyptian architecture that yet? carriest specimens of Egyptian architecture that yet remain to us, and which will probably endure as long as the world lasts, are the pyramids, and the monumental records known as obelisks; but to ascertain the efficiency they had attained in this art, we must go to the temples of Karnac, Edfou, Denderah, and that of Abou-Sambul, hewn out of the solid rock, as well as the architectural remains that still exist at Thebes and other ancient cities of Egypt. The pyramids are buildings of great solidity, but of simple form. They are built on a square base, with four triangular sides, that meet in a common apex. They are supposed to be royal mausoleums, and were built between 1500 and 1000 R.C. (See PYRAMIDS.) The obelisks are four-sided shafts of great size, terminating in a pyramidal top. They are hewn out of a solid block of stone; top. They are hewn out of a sond under on soone, they are also elaborately carved with hieroglyphica. The temples cover a great space of ground, and stand in a walled inclosure. Before the temple itself there is a large square court, surrounded on three sides by a colonnade. Access is obtained to this court through a doorway of great height, flanked on either side by quadrilateral towers, diminishing in size as they approach the top. The doorway and side towers are proach the top. The doorway and side towers are adorned with coloseal sculptured figures, and in some cases an avenue of figures, generally sphinxes, was made, leading directly to the doorway we have mentioned. The temple itself was generally raised, the court between it and the grand entrance being composed of a series of broad steps rising in a gradual slope. These steps lead to a magnificent hall or fortico, occupying nearly the entire width of the court. tico, occupying nearly the entire width of the court, in which there are generally six rows of pillars which support the flat and massive roof. From the portice we enter a smaller hall, also divided into narrow spaces by pillars that support the roof, and after crossing two or more chambers, each narrower than the one before it, we gam the innermost chamber, or shrine, exactly fronting the entrance, in which the statue of the di-vinity was placed, to whose worship the temple was dedicated. The area occupied at the temple at Ediou dedicated. The area occupied at the temple at Edfout is 414 feet long by 154 broad, the towers on either side of the gateway being 104 feet long by 47 broad at the base, and 94 feet in length by about 30 in width at the summit; but these proportions, large as they may summt; but these proportions, large as they may appear, are eclipsed by those of the temple of Karnac, the great hall or portice of this magnificent building being 338 feet long by 170 broad, and covering an area nearly equal to that of the entire temple of Kdfou. The entire length of the temple of Karnac is about 1,200 feet, and its breadth about 360. The columns, entablatures, and mouldings, are the great distinctive features of Egyptian architecture, in addition to the marked peculiarity that their doors and windows, and marked peculiarity that their thouse said the seven the buildings themselves, present; namely, the convergence of the sides; so that the breadth at the base is greatly diminished in extent at this summit. The size of the columns is in proportion to the extent of the building in which they are placed. At Karnao they are 9 and 11 feet in diameter. First they were square in form, then polygonal, and at last circular shafts were made. All are elaborately sculptured.

upper part of which projected considerably beyond the face of the walls of the building. The roof was perfectly flat. The doorways are surrounded by a flat moulding, and surmounted by a cornice and lintel of great depth. Figures attached to the walls were generally executed in alto-rilievo, like those that flank the doorways of the Assyrian palaces; but the hieroglyphics and representations of historical events were carved in low relief, in a style peculiar to Egyptian sculpture known as cave-rilievo. (See CARTOUCHE.) carven in low relief, in a style peculiar to Egyptian sculpture known as cano-riliceou. (See CARTOUGHE.)
The walls were adorned with paintings in red, blue, green, black, and yellow, on a white ground : gilding was also introduced as an embellishment, and the sculptured columns and the ecilings were also painted. The domestic dwellings of the Egyptians seem to have been built of brick, consisting of rooms ranged round a central court planted with trees, and having a founa central court planted with trees, and having a foun-tain in the centre. They were sometimes two and three stories high. The flat lintel is common to Egyptian, Grecian, and Assyrian architecture; the method of forming arched doorways and vaulted passages was known to the Egyptians, but it was seldom resorted to by them, and then principally in the construction of combs.

EGYPTIAN BEAN, (See NELUMBIUM.) EMBETIACER, er-e-ti-ai-se-e (in honour of D. G. Ehret, a German botanical draughtsman), in Bot., the Ebretia fam., a nat. ord. of dicotyledonous plants in the sub-class Corolliftora, resembling the Boraginacea in most of their characters, but differing from them in having the carpels completely united, so as to form a two or more celled overy; in their terminal style, and drupaceous fruit. There are 14 genera and 297 species, chiefy tropical trees or shrubs. The properties and uses of these plants are not very remarkable. Some species of Ehretia hear edible fruits. Some have a delicious odour, as Heliotropium peruviunum, the Peruvian heliotrope.

EIDER DOWN, i'-der down (Swed. dun), the down from the breast of the eider duck. The best is that which the birds have stripped from their breasts to provide a lining for their nests; that which is taken from the dead bird being considered inferior in quality, and called dead down, in contradistinction to that which is taken from the nests, and termed live down. The down is chiefly used for making coverlets that take the place of blankets on the continent; the down being placed between two pieces of linen or other material, and the whole quilted together to keep the feathers in place.

EIDER DUCK (Somateria mollissima), a species of wild duck inhabiting the frozen regions of the north. It is very abundant in Iceland, Lapland, Green-land, and Spitzbergen, on the shores of Baffin's Bay, ac. Generally, it is of a size intermediate between the domestic duck and goose. The head is large; the middle of the neck small, with the lower part of it spread out very broad, so as to form a hollow between the shoulders. The bill is horn-colour, the upper manthe snoulders. The one is non-count, are upper mandible being forked in a singular manner towards each eye, and covered with white feathers on the sides as far forwards as the nostrils. The top of the head is soft velvety black, cleft behind by a narrow streak of white; the feathers from the nape of the neck to the while; the feathers iron the nape of the neck to the throat are pulified out, and look as though the ends had seen clipped. The cheeks, chin, upper part of the neck, the back, and leaser wing-coverts, are white; bastard wings and primary quills brown; the front part of the neck to the breast is dun-colour, and thence to the under part of the tail deep black; tail brown; legs short and yellow. In Icoland and Norway the breeding-grounds of eiders are carefully protected, so that as little as possible may interfere with the growth of the eider-down crop. This curious and beautiful down grows on the breast of the bird, and the mode adopted to procure it is somewhat singular. The nest is composed of seaweed, and any hole or ledge is evidently considered an eligible building site. The number of eggs laid is usually five, eix, or seven: they are three inches long, two broad, and of a uniform pale green. When first deposited in the nest, they are allowed to go uncovered; but in few days the mother begins to pluck the down from her breast, and to cover them over; and this process would seem to be indispensable to the growth and latching of the young birds; for, if the nest be plundered, till the female has throat are puffed out, and look as though the ends had

left no more down on her breast, the male bird will begin to furnish the comfortable covering from his own body. The common practice is to remove the whole of body. The common practice is to remove the whole or the eggs with the down, twice, and to leave the third lot of eggs, that the birds may not be thinned in num-ber. The gross weight of the down yielded by one bird in a single season is half a pound; but this, when elsenned, is reduced by one-half. The elasticity of eider-down is so extreme that three-quarters of an ounce will fill a man's hat. It is capable of great compression, so that the down makes its appearance in balls no larger than a breakfast-cup, but weighing about three pounds. The flesh of the eider duck, though not so toothsome as that of the species familiar to us, is fit to be eaten, and is said to become of excellent flavour when the bird is wholly or even partially domesticated. They are evidently capable of easy domestication, at least sons who reside near the sea. The Hon. A. Dillon, who spent a winter in Iceland and Lapland, relates that five of these birds chose as their location the ground under a narrow bench that ran along the windows of his house, and that when approached they evinced no timidity, and would even allow their backs to be stroked.

EIDOGRAPH, V-do-graf (Gr. eidos, form, and gra-phein, to write), a machine which answers the pur-pose of a pantagraph, and is used for copying plans and drawings on the same scale, or for enlarging or reducing them in any proportion that may be desired. It was invented by the late Professor Wallace, of Edinburgh. It consists of a beam which moves in at horizontal plane, sliding in a secket that works on a vertical pin, which enters a tube in a mass of metal beneath it. The ends of the beam are fitted with pulleys that also work freely in an horizontal plane. Pieces watch-spring pass round the pulleys, being fastened to them at one point by a simple pin to prevent them from slipping on the circumference, and connected by wires, so as to form a kind of endless band, which may be tightened or loosened at pleasure by swivel screws. Rods of metal slide in sockets under the pulleys. One of these has a tracing-point and the other a pencil, but at opposite ends of the arms, so that they may be in a line passing diagonally through the central pin, on which the beam, and consequently the whole machine, works. The beam and arms are graduated and may be self to any required scale. When it is desired to use the machine, the operator, after setting the beam and rods as may be desired, passes the tracing-point over the drawing to be copied; a corresponding motion is communicated to the pencil at the opposite end of the other rod, which delineates a fac-simile of the

drawing to be copied.

EISTEDDYON, i-stoth'-vod (Welsh eistedd, to sit),
a name applied generally in Welsh to any meeting or
concourse of people, but more particularly to the
assemblies of the Welsh bards and minstrels, who
anciently formed an hereditary order. These meetings were forbiden by Edward I, at the conquest of Wales, but they were renewed by Henry VII., who was of Welsh origin. They have been again revived during the present century, and eisteddfods are held periodically at various Welsh towns in succession, at which prizes are awarded for proficiency in the Welsh tongue, and for poems in that language, and playing on the harp.

EJECTMENT, e-jekt'-ment (from Lat. e, out, and jactus, cast), is the name of an action at law, by which a party entitled to the immediate posses-sion of lands or other corporeal hereditaments may recover that possession from the party wrongfully withholding it. Until abolished by the Common Law Procedure Act, of 1852, this action exhibited the most remarkable string of fletions then recognized by most remarkable string of fictions then recognized by the courts of common law. This was by an action commonly known as John Doc v. Richard Roc. (See Don, John.) By the Common Law Procedure Act, of 1852, a writ is now issued out of any of the superior courts of common law, in a prescribed form, directed to the person or persons in possession by name, and generally to all persons entitled to defend the posses-sion of the premises therein described, setting forth son of the premises therein described, setting forth that some person or persons, by name, claim to be entitled to the possession, and to eject all other persons; and commanding those to whom it is directed, or

such of them as deny the alleged title, to appear in the court from which the writ is issued, within sixteen days after the service thereof, to defend the possession of the property. This writ (which remains in force for three months) is served by delivering it to the tenant in possession personally, or to some member of his family or household personally, on the premises; and any other person, on filing an affidavit that he or his tenant is in possession, may be allowed to appear in court and defend the action. If no appearance be entered, the claimant obtains an ordinary judgment entered, the chamant obtains an ordinary judgment by default, on which the sheriff gives him possession; but if an appearance be entered, an issue is at once made up without any pleadings, and the question is submitted to a jury.—Ref. Stephen's Commentaries on the Laws of England.

the Laws of England.

ELEMAGNACE, el-e-äg-nai'-se-s (Gr. elaia, an olive, and agnos, chuste), in Bot., the Oleaster fam., a nat. ord. of dicotyledonous plants in the sub-class Monochlamydee. They are trees or shrubs, with ontire exstipulate leaves, usually scurfy. The flowers are mostly discious, rarely perfect. Male flowers amentaceous, bracteated; sepals 2—4, or united; stamens definite, perigynous. Female flowers with an inferior tubular calyx and a fleshy disc; metivation imbricate; overy superior, l-called, with a solitary ascending ovule. Fruit inclosed in the succulous calyx; indebiseent. Seed solitary, ascending, with thin ascending over the memoscal new succession, with thin albumen; embryo straight, with an inferior radicle. There are four genera and thirty species, mostly natives of the northern lemisphere. The fruits of several species of the typical gen. Elaagnus are enten in Persia and some parts of India. Those of an English member of the family, namely Hippohaë rhamnoides, the sea-buckthorn, are also edible, and have been employed in the preparation of sauce for fish; but their use requires caution, as they contain a narcotic principle.

ELECCARPUS, elec-o-kar-pus (Gr. claia, an olive, and karpos, a fruit), in Bot., a gen. of plants belonging to the nat. ord. Tiliacex. The Molucca berries, which are frequently made into necklaces in India, are obtained from the species E. serratus. The outer portion of the fruit is pulpy, but the endocarp is hard, bony, and beautifully furrowed. The pulp is carefully removed from the berries when they are used

ELAIS, el-a'-is (Gr. elaion, oil), in Bot., agen. of palms. The two species E. gaincensis and melanococca are the Guines oil-palms, from the fruits of which the vegetable butter called palm oil is extracted. The fruits are drupaceous, and the oil is found in the sarcocarp. It is of a rich orange-yellow colour, and is extensively used in this country in the manufacture of candles and soap, being the chief raw material worked up at the great factories belonging to Price's Patent Caudle Company. In Africa it is used as food by the natives. Being emollient, it is sometimes used in medicine as an embroca-tion to spasms and bruises. The hard stony putament of the same fruits yields a limpid oil. Palm wine may be prepared from the juice which flows from the wounded spathes of the two palms.

ELAND, e'-land (its name at the Cape) .- This animal, considerably the largest of all the antelopes, is known by soveral different names,—the impoofoo, claud, Cape elk, canna, or bastard cland, are among the many terms applied to it. The ordinary claud is a large heavy animal, weighing, at full growth, from 7 cett. to 9 cett.; and, contrary to the rule amongst antelopes in general, is prone to be fat. Its usual size is that of a full-grown horse, measuring generally a little more than eight feet in length, and standing full five feet at the shoulder. The borns of the male are thick and heavy and about a foot and a half in length. They are considerably the largest of all the antelopes, is known heavy, and about a foot and a half in length. They are straight till they arrive at about three inches from the tips, where they bend outwards. They are also surrounded by a thick spiral wreath, which becomes indistinct at the points. The horns of the female cland are longer and smaller, and the spiral wreath is often absent. both sexes the head is long and pointed, the ears large, the neck thick, and in front of the chest is a loose banging skin or dewlap, with a border of long hair on its margin. A short erect mane of dark brown hair its margin. A short crow many the state of the forstead to the rost of the tail. This mane is directed backwards along the spine, but is reversed on the neck. The tail is more than two tail. This mane is our but is reversed on the neck.
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feet long, and terminates in a tuft of long black hair. The flesh of the cland is more prized as food than that of any other wild animal of Southern Africa. When of any other wild animal of Southern Africa. When dried and cured, the large muscles of the thighs are looked upon with high estimation, and are usually called thigh-tongues. Elands were formerly very common in the neighbourhood of Cape Town; but they have been so universally hunted, that they are only to be met with in the most retired parts of the The disposition of the cland is very mild and gentle, and it seems predisposed to domesticity. It is gregarious, and lives in large herds upon the low hills and level plains. Elands, when husted, are soon tired, as they are usually fat and short of wind. Very often they drop down during a chase from plethors. Of late years there have been many attempts made to intro-duce the eland among the animals used for food in duce the cland among the animals used for food in England. The attempts have all been successful, and not only in the Zoological Gardens in Regent's Park, but also in the grounds of noblemen and private gentlemen, the cland has been reared and bred. Concerning its flesh as food, Dr. Livingstone, the celebrated Africau traveller, writes as follows:—"Our parly was well supplied with cland-flesh during our passage through the desert; and it being superior to beef, and the animal as large as an ox, it seems strange that it has not yet been introduced into England." The Acclimatization Society has given much attention to the qualities of the cland; and it is more than probable that in a few years it will be largely bred in Great Britain. The scientific name of this animal is Antilope oreas. Antilope oreus.

ELASTICITY, e-lae-tis'-e-te (from Fr. élastique, elastic, primarily from Gr. elastes, an impeller forward), that property which certain bodies possess of recovering their former figure or state after internal pressure, tension, or distortion. Elasticity is perfect when the body exactly recovers its primitive form after the force by which its form has been changed is removed. Perfect elasticity is, however, not to be found in nature. Aëriform fluids or gases approach nearer to perfect elasticity than any other substances. In solid bodies, as a general rule, elasticity is destroyed by use: thus a bow loses its elasticity by being kept bent. by use: thus a bow loses its elasticity by being kept bent. Iron and steel can have their elasticity increased by being tempered, that is, by contracting their volumo suddenly after being expsuded by heat.

ELATERIUM. (See F. GBALIUM.)

FLATINACEM, e-lift -e-nui-se-e (Gr. elate, a fir; the leaves resembling those of the fir-free), in Bot., the

Water-pepper fam, a nat. ord. of dicotyledonous plants in the sub-class Thalamiflore, consisting of six genera and about 22 species,—little annual marsh-plants with hollow stems and opposite leaves, with interpetiolar sti-pules. The flowers are small and axillary; sepals and petals 3-5; the laiter, as well as the stamens, being hypogynous. The fruit is capsular, 3—5-celled; the placentation axile. The styles 3—5; stigmas capitate. The seeds are numerous and exalbuminous. The plants of this small order are scattered all over the model. The concerned to president heard. They are generally considered acrid.

ELBOW, el-bo (Sax. elneboga), in Anat., is the joint of the arm formed by the lower end of the humerus and the upper end of the radius and ulna. The lower end of the humerus is received into the hollow of the ulna, so as to produce a hinge-like arrangement, and the upper end of the radius forms also a small part of the The surface of the humerus in contact with the ulna is limited, internally and externally, by a promineat ridge, and is hollowed out in the centre; that in contact with the radius is a small rounded eminence which moves in the cavity of the latter. front of the humerus, above the articular surface, are two depressions that receive the coronoid process and the head of the radius during flexure, and behind is a large fosse for the reception of the olecranos, or large process of the ulns, in the extension of the forearm. Where the bones touch, their surfaces are covered with cartilage, and their articular ends are kept in place by a number of ligaments.

ELROW-BEERS, the plates of metal used to cover the chow-joint at the junction of the brassart, or rere-brace, and the vaut-brace, the former of which served as a protection to the arm between the shoulder and the clbow, and the latter to the lower part, between

### Elder

the shoulder and the wrist. They were sometimes called conditeres. The elbow-piece is shown in the illustration appended to the article on Brassauts.

BLDER, el'der (fr. prebletere), is the comparative degree of the Ang. Sax. eld, and denotes one who is older than others; and hence an overseer or ruler. In the ancient Jewish polity, the elders were persons of considerable age and experience, and who consequently obtained certain there is almost over other considerables. obtained certain, power and influence over others.
When Moses was sent into Egypt to deliver the children of Israel, he assembled the elders of the people, and told them that God had appeared unto him. Afterwards Moses associated with himself in the government seventy of the elders of Israel, which, according to the generality of interpreters, was the beginning of the Sauhedrim (which see). Every city, also, had its elders, who seem to have possessed a certain local jurisdiction. In the New Testament, the term chiler is employed to designate a certain class of officers in the church, regarding the office and duties of whom there are various conflicting opinions. Whether the elders were lay officers of the church, has long been mutter of dispute. It appears certain, however, that the elders mentioned by St. Paul (1 Tim. v.) did not hold the same office as word and decrine." It is said that Calvin admitted lay elders into church courts on what he conceived to be the sanction of the primitive church, and "as an effectual method of preventing the return of inordinate Presbyterian church, are certain laymen who are elected and ordained for ecclesiastical office, and who, in conjunction with the minister and descons, composa in Scotland the kirk session. The number of elders is proportioned to the extent and population of the parish, and they are usually persons of tried character and Christian excellence. They have no right to teach or to dispense the sacraments; but in every question of jurisdiction within the parish, they form a spiritual court, of which the minister is officially moderator; and in the presbyteries, synods, and treneral Assembly, they sit as representatives of the several sessions or consistories. Formerly the power of the kirk-sessions in Scotland was much greater than at present. They used to take cognizance not only of all grosser immoralities, as swearing, drunkenness, lewdness, absence from public worship, &c., but also card-playing, racing, dancing, and the like. Their duties, in many respects, now correspond to those of churchwardens in the Church of England.

ELDER, in Bot. (See Samucus.) En Dorano, et do-ra'-do (Span., the golden region), the term applied by the Spaniards, in the 16th century, to an imaginary land abounding in gold and all kinds of precious stones, and supposed to be situate in the interior of South America, between the rivers Amazon and Orinoco. The origin of this fable was due to the heated imaginations of the avaricious Castilian adventurers, who loved to dream of regions more golden than those of Mexico and Peru. Many expeditions were fitted out for the purpose of discovering it, and, were fitted out for the purpose of discovering it, and, although each proved abortive, the belief in the existence of the "golden land" survived until the commencement of the 18th century. In England, even, the fable took root, and Sir Walter Raleigh twice visited Guiana in search of "El Dorado." The term has now become the property of the poet, who uses it to express a land of boundless wealth and felicity, like the Paradisc of Mahomet or the Elysian fields of the ancients.—Ref. Edinburgh Review, vol. lxxii., art. Sir Walter Ruleigh

ELEATICS, e-le-lit-iks, the name of an ancient sect of philosophers, so called from Elea, a Greek colony of lower Italy, which was in all probability the residence,

## Election of Members of Parliament

rather a pantheism. They opposed the polytheism of the times by maintaining the infinity and self-existence the times by mantaning the infinity and self-existence of One; but they could not separate that One from the world. The apparent changes of the universe they regarded as mere illusions of sense, the Infinite being without change or corruption. "Whatever estimate," says Ritter, "may be formed of the Electic doctrine and its results, it cannot be denied that, as the first attempt to correct the conceptions and representations of sense by the pure notions of reason, or, at least, to reduce them to their true value, it is in the highest degree deserving the attention of the philosopher. By it the pure speculative element of thought was first abstracted from all that is incidental to its concrete appearance, and consciousness awakened thereby to a truer notion of philosophy. At the same time it is far from unprofitable to observe the course of the attempt to abstract from the sensible appearance, the perfect knowledge of true being, however unsuccessful the casay."

ELECAMPANE. (See INULA.)
ELECTION, e-lek-shun (Lat. electio, a choice, selection), in a general sense, is the act of selecting one or more from a greater number, for any use or purpose. In Law it is also when a man is left to his own free will to take or do one thing or another, which he pleases. It is the obligation imposed upon a party to choose between two or more inconsistent or alternative rights or claims, where he cannot enjoy the benefits of both. In courts of equity the principle of election is frequently applied where a party has inconsistent rights, and is compelled to elect which he will enforce. It has been said that the doctrine constitutes a rule of law as well as in equity, but that, in consequence of the forms of proceeding at law, a party cannot be put to elect. Every act of election presupposes a plurality of gifts or rights, with a right to the party to elect any one of them. Though, as a general rule, a person is not allowed to sue in equity and at law to, the same thing, but is obliged to elect in which court he will proceed, yet there is an exception in the case of a mortgage, who may proceed both in equity and at law at the same time.—Ref. Wharton's Law Lexicon.

Electron, in Theol., "is a purpose of God referring to certain and definite persons of the fallen and sinful

race of mankind, determining to unite them to Christ, and by means of that new connection with him to bring them to perfect holiness and happiness."—(Pye Smith.)
That God hath out of his mere good pleasure from all I that God into out of his mere good pleasure from all eternity predestined some of the human race to everlasting life, and left others to inevitable and eternal damnation, is a doctrine clearly taught in Scripture, and is a necessary consequence of the omniscience and foreknowledge of God. (See PREDESTINATION.)

ELECTION OF MEMBERS OF PARLIAMENT.—When a

new parliament is to be summoned, the lord chancellor receives a written command from the sovereign in council to that effect, and directs the clerk of the erown in chancery to issue writs to the returning officer of each electoral district. The returning officer of each county must, within two days of the receipt of the writ, cause proclamation to be saide of the time and place of said election, which must be not later than the twelfth nor sooner than the sixth day after said proclamation. In boroughs, the officer must proceed with the election within six days after the receipt of the writ, having first given three clear days' notice thereof. On the day fixed for the election, the writ is read in public by the returning officer, and candidates are pro-posed and seconded by qualified electors. A shew of hands is then taken of those present, and the officer declares the apparent result, without, of course, knowing whether those who have held up their hands be electors or not. If the parties are satisfied with this declaration, the election is at an end; but if the parfounder of this sect, and the principal seat of its cultivation; for its great propagators, Parmenides and Zeno, were natives of this town. The Eleatic school is pre-eminently distinguished from the Pythagoroan and Ionian by the recklessuress with which it strove to attain to an exclusive knowledge of the supra-sensible. They attempted to construct a system of the universe, and maintained that the aboutes of all truth was something independent of and source of all truth was something independent of and superior to sense. Their system was a monotheism, or

## **Election Committees**

day following that fixed for the election, unless a Sunday, Good Friday, or Christmas Day; and in coun-ties on the day next but two after the day fixed for election. On the day next after the close of the poll (in counties on the day next but one), the returning officer is to open the poll-books and declare the state officer is to open the poll-books and declare the state of the poll, and make proclamation of the member or members chosen, not later than two o'clock in the afternoon of that day. The election being closed, the officer returns the writ, with the names of the persons elected by the majority, to the clerk of the crown in chancery, to whom also the poll-books are to be delivered for their future safe-custody. The candidate is considered to be a member of parliament from the moment of the declaration of the poll, although he does not act as a legislator until he has taken the baths. No person is competent to vote at the election oaths. No person is competent to vote at the election of a member of parliament unless his name appears on the register of electors; but in the case of one so registered no exception can be taken at the time of polling. In order to prevent bribery, treating, and intimidation at elections, the returning officers are now required annually to appoint certain officers, called election auditors, whose duty it is to take and publish an account of all expenses incurred at elecpublish an account of an expense incurred a second tions; and any payment in respect of any election made otherwise than by or through the election auditor is declared to be illegal. Bribery, if proved, involves the disqualification of the elector, and the unseating of the member chosen, if brought home to him.

ELECTION COMMITTEES.—At the beginning of every session of parliament the Speaker appoints by warrant six members of the House as "the General Committee of Elections." The members must be willing to serve, their seats must be unquestioned by petition, and they must not themselves be petitioners against any election. The Speaker's warrant is laid upon the table of the House, and if not disapproved of in the course of the three next sitting days, it takes effect. To this committee all election petitions are referred, and it is their duty to choose a committee for the trial of each petition, called therefrom an "Election Committee". Fash election committee. tee." Each election committee consists of a chairman and four other members of the House; the former of whom is chosen by and from out of a select body called the chairmen's panel (appointed to serve for that session by the general committee), and the latter by the general committee itself. This select committee, who general committee itself. This select committee, who are sworn truly and faithfully to try the matter before them, and are required to examine all witnesses on oath, then proceed to try the merits of the return or election (admitting no evidence, however, against any voter, or in support of any objection, not set forth in the list of voters, and objections which had before been delivered to the general committee), and determine whether the sitting members, or either of them, or any whether the sitting members, or either of them, or any or what other person, were duly returned or elected, or whether the election be void. Such decision, being final between the parties to all intents and purposes, is reported to the House at large, and entered in their journals.—Ref. Stephen's Commentaries on the Laws of England; May's Law of Parliament.

Elector, e-lek'-tor (Lat., from electum, supine of eligers, to choose), a dignity which is now merely nominal, the privileges that were formerly attached to it being lost, and the title retained by the ruler of Hesse-Cassel alone. It was originally applied to the high potentates of the empire, who claimed the right

high potentates of the empire, who claimed the right high potentaces of the empire, who claimed the right of participating in the election of the emperor. By the Gciden Bull of Charles IV. of Germany, which was accepted and confirmed by the diet of Nuremberg in 1856, the exercise of this privilege was restricted to a few of the leading princes and ecclesiant and the state of the s structed to a lew of the leading princes and ecclesia-tics, and it ultimately became hereditary in certain families, and confined to the king of Bohemia, the electors of Brandenburg and Saxony, the elector-palatine of the Rhine, and the archbishops of Co-logue, Treves, and Mayence. Bayaria became an electorate under Maximilian the Great in 1823, and Hanover in 1692, under Ernest Augustus, bishop of

## Electrical Machine

were lost at the dissolution of the Holy Roman empire by Napoleon in 1806, the last emperor, Francis II., having abandoned the title of emperor of Germany for that of emperor of Austria in 1804. The title had fallen into disuse, to a certain extent, long before this event, from the elector of Brandenburg having become king of Prussia in 1701, the electors of Saxony kings of Poland in 1897 and 1733, and the elector of Hanover king of Great Britain and Ireland in 1714. Bayaria, Saxony, and Hanover were erected into kingdoms in 1805, 1806, and 1814 respectively, when the rulers of each finally abandoned the title of elector for that of

ELECTRIC, e-lek-trik (Gr. elektron, amber), in Phys., the term generally applied to a substance which may, under ordinary circumstances, be readily made to evince electrical properties by friction. Amber is a powerful electric, and its property of attracting light particles of matter when rubbed was known to the ancients. From the Greek word for amber, the terms electric, electricity, electroscops, and many others, are derived. Electrics do not transmit, or conduct, electricity; hence they are frequently termed non-conductors, or insulators; whilst, on the other hand, anelectrics (which see) are transmitters, or conductors, of electrical action. The most perfect electrics are shell-lac, sulphur, am-The most perfect electrics are abel-lac, sulphur, amber, jet, resinous bodies, gums, gun-cotton, glass, silk, diamomd, agate, tourmaline, dry fur, hair, wood, feathers, paper, turpentine and various oils, dry atmospheric air and other gases, steam of high elasticity, and ice at 0° Fah. (See Electricity.)

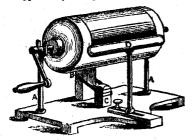
Electric Clock. (See Horology.)

Electric Light. (See Llumination.)

ELECTRICAL EEL (Gymnotus electricus) .traordinary fish is an inhabitant of the firesh-water traordinary his is an inhabitant of the hresh-water lakes and rivers of the warmer regions of America, Africa, and Asia. A specimen more than three feet in length was preserved alive in London between the years 1838 and 1842, and was examined by a great many electricians. Like the torpedo (which see), it has the power of giving electrical shocks; which power it exerts for killing or atunning the fishes upon which it feeds. Its body is smooth and without scales. A long ventral fin extends from behind the head to the extremity of the tail; the mouth is armed with sharp teeth, and projecting into it are numerous fringes, that, from their nature, appear to serve a purpose in respiration. The gullet is short, terminating in a ca-pacious stomach. The electrical organs are situated on pacious stomach. The electrical organs are situated on each side, and consist of flat purtitions or septa, and cross divisions between them. The outer edges of these sents appear, when the skin of the body is turned over, in parallel lines, nearly in the direction of the longitudinal axis of the body. They are thin membranes nearly parallel to one another, their breadth being nearly the semi-diameter of the body. A powerful shock is felt when one hand is placed near the head and the other near the tail. By the electricity generated by the specimen exhibited in England, Faraday magnetized steel needles, and decomposed iddied of magnetized steel needles, and decomposed iodide of potassium with the greatest case. A single medium discharge from the animal is calculated to be equal to the electricity of a Leyden battery of fifteen jars, containing 3,500 square inches of coated glass, charged to the highest degree.

ELECTRICAL MACHINE, an instrument for the excitation and collection of electricity. The earlier elecsimple glass tubes or rods of sulphur, which were held in the hand and excited by friction with silk or flamel. The first idea of a machine originated with the celebrated Otto Guericke of Magdeburg, who mounted a globe of brimstone on an axis, and caused it to revolve rapidly against the palm of the hand. For the globe of brimstone Dr. Hauksbee afterwards substituted a globe or glass; and Professor Winkler, of Leipsic, rendered the apparatus much more useful and convenient by affixing a cushion of soil leather stuffed with horse-heir, so that, by the pressure of a spring, it might rub against the revolving globe. In the electrical machines Onsburg. In 1778, Bavaria was united to the pulanow in use, the electric be excited is either a hollow
tinate of the Rhine, and the number of electorates was
cylinder or a circular plate of glass. For most purreduced to eight. Some minor electorates were created
at the commencement of the present century, after the
the more simple in construction and the less liable to
peace of Luneville; but the privileges of the dignity
740

pillars, A, A, usually of glass, which are fixed to a firm wooden base. Pressing against the cylinder is a flat cushion or rubber of coarse oiled silk, stuffed with wool or hair. This may be also fixed on an insulating pillar of glass. In the annexed figure, however, it is supported by a hinged wooden pillar B, which



ELECTRICAL MACRINE.

is drawn towards the cylinder by an elastic band placed over a block of wood, C. A long flap of thin silk, oiled on the upper side only, is sewed to the cushion, and rasts upon the upper half of the cylinder. Opposite the loose edge of this flap is a row of metallic points connected with a metallic cylinder called the conductor, D, which is also supported by an insulating glass pillar. When the glass cylinder is put in motion by means of the winch attached to one of its pivots, the two kinds of electrical power which, when combined neutralize each other, are one of its pivots, the two kinds of electrical power which, when combined, neutralize each other, are developed, the conductor becoming charged with vitrous or positive electricity, and the cushion with resinous or negative electricity. When it is requisite to obtain vitrous electricity for charging jars or other purposes, the cushion must be connected with the action of the chain vitrous exists in vidential the charinity of the connected with the charge of the charge that the charge the connected with the charge that the charge the charge that the charge the charge that the charge t purposes, the cusmon must be connected with the earth by a chain or wire, in order that the electricity drawn from the glass by the points of the conductor may become continually replaced by that supplied from the earth. If it be required to collect resinous electricity, this arrangement must be reversed. The conductor must be connected with the earth, and the body to be charged must be presented to the insulated cushion. The plate-glass machine was devised by Van Marum about the year 1776. As constructed by Cuth-bertson some few years after, the machine consisted of a circular disc of plate glass, from two to seven feet in diameter, mounted on an horizontal axis of metal, and sustained by a vertical frame of wood, to which were attached two pairs of cushions, one above and the other below. The plate was turned round between the rubbers by a winch fixed to the extremity of the axis. The electricity was contined by flaps of oiled silk, extending from each pair of cushions round nearly one fourth of the circumference of the plate, and was then collected by two rows of points opposite its horizontal diameter, and communicating with an insulated metallic conductor. The plate-machine, as originally constructed, was not adapted for the collection of resinous or negative electricity; but it has lately been so modified that this defect has been completely overcome. Sir W. Snow Harris, in his "Rudimentary Electricity," describes a most effective arrangement, calculated to describes a most effective arrangement, calculated to meet every difficulty in the use of the glass plate for both kinds of electricity. There are several instruments for exciting and collecting electricity besides the cylindrical and plate machines. (For notices of these, see Battrary, Electrical and Voltaic; Electrometous: Hydro-electric Machine; Induction

see BATTERY, ÉLECTRICAL and VOLTAIG; ELECTRO-THORUS; HYDRO-ELECTRIC MACHINE; INDUCTION COIL; JAR, ELECTRICAL.)

ELECTRICITY, e-lek-tris'-e-te (Gr. elektron, amber, the substance in which electrical properties were first recognized), the name given primarily to one of the great forces of nature, and secondarily to that branch of physical science which has sprung from the investi-gation of phenomena depending on this particular force. The ancients were well acquainted with the fact that certain bodies, when rubbell, acquire the power of attracting light particles of matter. Thales of Mile-tus, the founder of the Lonic philosophy, who flourished

#### Electricity

some 600 years before the Christian era, developed this attractive property in amber by friction, and con-cluded that the substance was animated by an unknown spirit or element. Theophrastus, some centuries later, observed the same attractive property in a crystal termed the lyncurium, now supposed to be the tournaline. Pliny and other naturalists refer to the sttractive power of amber as something well known, but say nothing to lead us to suppose that their knowledge say nothing to lead us to suppose that their knowledge of electrical phenomena went beyond the discoveries of the old philosophers. The first attempt towards a generalization of electrical phenomena was made near the close of the 16th century, by Dr. William Gilbert, in a treatise on the Magnet. In the following century, Dr. Wall, Boyle, Newton, and others, socumulated many new facts; but these were not of a nature to lead to the discovery of general principles. The electric spark was first noticed by Dr. Wall. In the early part of the last century, Dr. Hauksbee made many electrical experiments, from which he sacertained that glass was a substance which could be readily electrified by friction; and that some other bodies, especially metals, a substance which could be readily electrified by friction; and that some other bodies, especially metals, treated in the same manner, manifested no electrical power whatever. In 1728, Mr. Stephen Grey, a pensioner at the Charterhouse, performed a number of experiments which led to the discovery of electrical conduction, and to the classification of bodies into conductors and non-conductors. The conclusions arrived at by Grey were firmly established by the briliant researches of Du Fsy, a Freuch philosopher, to whom we are indebted for the discovery that there are two opposite states of electrical excitation, in which forces are developed attractive of each other. In 1745 forces are developed attractive of each other. In 1745 and 1746, numerous attempts were made to confine electricity in glass vessels containing water or mercury; and, almost simultaneously, Von Kleist in Germany, and Cunzus in Holland, became acquainted with the disagreeable effects of the electric shock. Muschenbrock, of Leyden, repeated the experiments of Cunzus, and published a wonderful report of the effects of the shock received from the apparatus, which is still known as the Leyden jar or phial. The discoveries of Franklin followed soon after, and greatly advanced the science of electricity. By a series of beautiful experiments with a common kite, this celebrated philosopher ascertained what had been before conjectured, that lightning was an electrical phenomenon. Carendish afterwards was an electrical phenomenon. Cavendish afterwards entered with great spirit into the field of electrical research, and thoroughly investigated the conditions of bodies charged with electricity. About the year 1799, Galvani, of Bologna, discovered that the mere contact of metals with the muscles and nerves of a frog contact of metals with the muscles and nerves of a frog recently killed produced convulsive motions; and, by repeating Gaivani's experiments, the celebrated Volta, a professor of natural philosophy at Pavia, was led to the discovery of the apparatus now known set he Voltaic pile, a discovery which gave rise to a new branch of electrical science, which is termed galvanism, or, more correctly, Voltaic electricity. Davy's researches proved that the voltaic current was a most potent agent in chemical analysis. Oersted discovered, in 1820, that the current exerted a peculiar influence on the magnetic needle, and founded the science of electro-magnetism, which was soon afterwards fully developed by Ampère. which was soon afterwards fully developed by Ampère. Faraday, in his "Experimental Researches in Elecpublished between 1830 and 1840, described tricity," published between 1830 and 1840, described the phenomena of volts-electric and magneto-electric induction, and thus established the beautiful science of magneto-electricity. Seebeck, of Berlin, found that an electric current may be generated by the unequal effects of heat on different metals in contact, and gave the name of thermo-electricity to the new branch of science which sprung from this observation. Among the modern electricians to whom the world is greatly indebted are Grove, Wheatstone, Becquerel, Pouillet, Jacobi, Spenser, De la Rive, Harris, and Henry. The peculiar power which we call electricity is only known to us by its effects, and such terms as electric fluid and to us by its effects, and such terms as electric fluid and electrical current are to be understood as figurative expressions. Many theories respecting the nature of electricity have been advanced for the purpose of explaining electrical phenomena. That of Du Fay and Symmer supposes electricity to be an infinitely attenuated fluid pervaging all bodies, and composed of two primary elements possessing distinct and opposite

# Electricity, Atmospheric

Electricity, Frictional

properties. These elements, called viercous and resinous electricities, are supposed to neutralize each other when combined, electrical repose being the result. When, however, a disunion of these elements takes place, each becomes active. In accordance with this theory, electrical excitation consists in a separation and abstraction of one of the elements, leaving the other in excess or uncompensated. The theory started by Frankin supposes the existence of a single homogeneous imponderable fluid of extreme tenuity and clasticity, in a state of equable distribution throughout the material world. This fluid is assumed to be out the material world. This fluid is assumed to be repulsive of its own particles, but attractive of all other matter. When distributed in bodies, in quantities proportionate to their capacities or attraction for it, such bodies are said to be in their natural state. When we increase or diminish the natural quantity of electricity in any substance, excitation is the result, and the substance, if overcharged, is said to be electrified positionly, or, if undercharged, negatively. The theories of Eules and Cavendish are less defective than those of Du Fay and Franklin, upon which they are respectively based; but even these are now found to be inadequate for the elucidation of electrical phenatural of the change of the control phe-momens. Adopting the views of Faraday, scientific men of all nations now recognize two kinds of elec-trical force, distinguished by the terms positive and negative, but do not assume the existence of any pe-culiar kind of matter to which the term sleetic fluid may be applied. For a lucid exposition of Faraday's theoretical views of electrical action, the reader is referred to Sir W. Snow Harris's "Rudimentary Treatise on Electricity." As the various branches of electricity on Electricity." As the various branches of electricity are generally considered as distinct sciences, they are are generally considered as distinct sciences, any are treated separately in this work. The following are the principal heads under which electrical phenomena are described:—ELECTRICITY, FRICTIONAL; ELECTRICITY, VOLTAIC; ELECTRO-CHEMICAL THEORY; ELECTROLY-SIS; ELECTBO-MAGNETISM; MAGNETO-ÉLECTRICITY; LIGHTNING BED THUNDES. The more important electrical machines and instruments are noticed under BATTERY, ELECTRICAL and VOLTAIC; ELECTRICAL MACHINE; ELECTROPHORUS; ELECTROSCOVES and ELECTROMETERS; HYDRO-ELECTRIC MACHINE; IN-DECTION COIL; JAR, ELECTRICAL. For information respecting the chief practical applications of electricity, see Electro-MOTUS POWER; ELECTRO-PLATING AND GILDING; ELECTROTYPE; LIGHTNING-CONDUCTOR; TELEGRAPHY; ILLUMINATION.

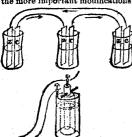
ELECTRICITY, ATMOSPHERIC, the term applied to electricity as a natural agent existing and acting in the atmosphere. Electricity is called into action upon a grand scale in the thunderstorm. How the electric accumulation takes place is a subject that has never been clearly ascertained, but it probably results from a variety of causes, and is also connected with some peculiar power in masses of aërial vapour, which enables them to receive and retain electrical charges. The analogy between lightning and electricity seems to have been first noticed by the Able Nollet, in 1748. It was afterwards verified by Benjamin Franklin, at Philadelphia, in 1752. (See LIGHTNING.) There is still very little known about the cause of atmospheric There is electricity. The many changes which are continually occurring on the surface of the earth and in the sur-rounding atmosphere are, doubtless, of such a nature rounding atmosphere are, doubless, of such a nature as to disturb the electric equilibrium. Evaporation, change of state or form in the varieties of matter, changes of temperature, chemical action, all these combined, asem to produce those enormous electrical accumulations called thunderstorms. (See Thunder, Thundersonm.) The beautiful phenomens of the aurora borealis is most probably connected with, or dependent upon, atmospheric electricity. (See Aurora Berralis.) All meteors were at one time considered as derived from electricity; but the showers of stones by which many of them are accompanied show that they must be ascribed to other sources. (See Metros, Merrosio Storks.) Those bodies called falling stars are considered by many to have an electric origin. They are most common when the atmo-aphere is favourable to electric accumulation.

from those comparatively new sciences which have reference to the phenomena attendant on electrical excitation by chemical action, magnetism, and heat.
If a stick of seuling-wax be rubbed with a dry piece of it as stated is a state with a try piece of faunci or cloth, it becomes electrified, in other words, it acquires the power of attracting light bodies, as feathers, wafers, or bits of paper. Many other substances besides sealing wax can be readily electrified by friction, and such substances are termed electric by friction, and such such such such as are termine section (which see). If a light, down, feather be suspended by a flue thread of white silk, and a dry glass tube, excited by rubbing, be presented to it, the feather will be strongly attracted to the tube, will adhere to its surface for a few seconds, and will then fall off. the tube be now excited anew, and presented to the feather, the latter will be strongly repelled. same experiment may be repeated with the stick of scaling-wax; the feather, in its ordinary state, will be drawn towards the excited body, and after touching again driven from it with a certain degree of force. Now, let the feather be brought into contact with the excited glass so as to be repelled by that substance, and let the excited sealing-wax be presented to it, a degree of attraction will be observed far exceeding that exhibited when the feather is in its ordinary state. Or, again, let the feather be made repulsive for sealing-wax, and then let the excited glass be presented; strong attraction will ensue. These experiments prove that there are two opposite kinds of electrical excitement, and that a body, to which one kind has been communicated, is attracted by another body in the opposite state, and repelled by one in the same state. It is customary to call the electricity manifested by glass positive or vitreous, and that developed in the case of sealing wax and bodies of the same class, negative or resingue. The kind of electricity resulting from friction appears, however, to depend on some peculiar condi-tion of contact between the rubbed surfaces; thus smooth glass rubbed with silk or wool becomes positive, but when roughened by sand or emery it acquires, under the same circumstances, a negative charge. Again, when silk is rubbed with glass, it becomes negative, but when rubbed with sealing-wax, positive. Both tive, but when rubbed with scannig man products whinds of electricity are produced in every case of electrical excitation, the rubber and the rubbed body always assuming opposite states. There are many always assuming opposite states. There are many substances which cannot be excited in the ordinary way, though they may be electrified by placing them in communication with an excited electric. are termed anelectrics (which see), or more correctly conductors, from their property of conducting the electrical force. If an electrified pith-ball, suspended by a silk thread, be touched by any electric,—a stick of dry scaling wax for instance, its attractive power will not be in any sensible degree impaired; but if it be touched with any conductor in communication with the ground, it will instantly lose its electrical charge. It is therefore evident that electrics are non-conductors, or insulators, and that anelectrics are transmitters, or conductors, of electrical action. Modern researches have, however, proved that the difference between the two classes is only one of degree, not of kind; the very best conductors offer a certain resistance to the electrical discharge, and the most perfect justila-tors permit it to a amail extent. The metals are by far the best conductors; shell-lac, sulphur, glass, silk, and dry gas, the worst. Electrical discharges take place silently and without disturbance in good conductors of sufficient size; but if the charge is very intense and the conductor very small, or imperfect from its nature, it is often destroyed with violence. When a break is made in a conductor employed in effecting the discharge of a highly-excited body, disruption or spark-discharge takes place across the intervening air, provided the ends of the conductor be not too distant. The electrical spark itself presents many points of interest in the modifications to which it is liable. The time of transit of the electrical force it is liable. The time of transit of the electrons force through a chain of good conducting bodies of great length is so minute as to be altogether inappreciable to ordinary means of observation. An electrified body exerts a peculiar influence upon neutral conducting bodies at sensible and even considerable distances. BLECTRICITY, FRICTIONAL.—By this term, that de-partment of physics which relates to the phenomena of ordinary electricity may be conveniently distinguished duction, may be thus examined:—Let two small cylin-

ders of metal be insulated upon supports of glass varnished with a solution of shell-lac in spirits of wine, and let these insulated conductors be placed end to end at a short distance apart. Now, if one conductor be charged with positive electricity, it will induce a negative state in the nearer portions of the other, and a positive state in the more remote parts. The precise condition of the second conductor cannot be properly investigated without the aid of the most delicate electroscopes; but with a suspended pith-ball the attractive power of its distant extremity may be readily detected. On removing the electrified conductor, the second conductor at once loses its attractive power. For experiments on electrical attraction two power. For experiments on electrical attraction and repulsion, a large glass tube will be found very useful. To excite it, the rough side of oiled silk (oiled only on one side) rubbed over with aurum musicum (which see), may be used; or, if such a rubber cannot readily be procured, a dry soft silk handkerchief may be employed. To exhibit the mechanical, luminous, and heating effects of the electrical discharge, we require an electrical machine (which see), and for the accumulation of electricity of great intensity we demand, in addition to this, those powerful instruments the jur and bottery. (See these words.)
ELECTRICITY, MEDICAL. (See ELECTRICITY, VOL-

TAIC; INDUCTION-COIL.)

ELECTRICITY, VOLVAIC, or GALVANISM, the science which relates to the phenomena connected with a peculiar form of electrical force obtained by certain arrangements of netals and liquids. Galvani, a pro-fessor of anatomy at Bologue, in 1789, made the dis-covery that the transmission of electricity through the nerves of a frog, recently killed, would excite muscular contractions; and he afterwards found that similar convulsions could be produced by merely touching the nerves and muscles with two different metals and then bringing the metals into contact. Upon these and similar phenomens, observed in an extended series of experiments with different animals, Galvani based his theory of "animal electricity," which was received with enthusiasm by the Italian physiologists of his day. According to this theory, every animal is endowed with an inherent constitutional electricity, generated in the brain and distributed through the nervous sysa professor of natural philosophy at Pavia, repeated Galvani's experiments, and proved that the contractions in the muscular fibre depended, not on any peculiar electrical condition of the animal frame, but on a feeble action derived from the metals with which the nerves and muscles were brought into contact. determine the exact conditions under which electrical disturbance is produced, he commenced a course of disturbance is produced, no commenced a course of experimental researches on the energies of different metals, which eventually led him to the discovery of the pile, an apparatus which must be regarded as the source of all the great discoveries relating to electricity made in modern times. The original voltaic pile, and the more important modifications of it which are now



in use, are fully described under the head of Bar-TRHY, VOLTAIC. The opposite figs. represent three cells of Volta's couronne des tassea, or crown of cups, the most simple modifica-tion of the pile, and a single cell Professor Daniell's conbattery. stant The arrows show

taken by the positive current out of the battery, taken by the positive current out of the battery, positive to the zine, the current in the reals being from the copper to the zine, the current in the reals being from the zine to the copper. Two theories have been offered in explanation of the action of the voltaic pile or battery. The contact theory of volta assumes that different metals have different volta assumes that different metals have different radius electrical capacities, and that electrical disturbance radius electropositive pole. (See Electrical capacities, and that electrical disturbance radius electropositive. When an electric current in the pole to the capper. In the pole to the compound with sufficient pole of the battery, and the other electro-positive. When an electric currely in the pole to the compound with sufficient pole to decompose it, its electro-negative constituent pole of the battery, and the vire connected with the positive pole of the battery, and the vire connected with the positive pole of the battery. The compound with sufficient pole to decompose it, its electro-negative constituent pole to decompose it, its electro-negative constituent pole to decompose it, its electro-negative constituent pole of the battery. The contact theory of the battery are the vire connected with the negative pole of the battery. The contact theory of the battery are the vire connected with the negative pole of the battery.

results from simple contact. In applying this theory to the pile, or crown of cups, it is assumed that each zinc plate takes electricity from the copper plate in contact, or connected with it, and at the same time discharges electricity through the moist or fluid conductor into the next copper plate. This theory is embarrassed by anomalies and improbabilities, and has been rejected by most scientific men. The chemical theory, new generally adopted, assumes that the chemical action set up between the solids and liquids of the pills in the source of its new of the pills of the pills in the source of its new of the pills of the pills in the source of its new of the pills of the pill mical action set up between the solids and liquids of the pile is the source of its power. The facts which support this theory are very numerous, and most of them are inexplicable when viewed by the light of the contact theory. Faraday and others have proved that chemical action does give rise to electrical force; that when the chemical action of a battery diminishes or ceases, the voltaic current also diminishes or ceases; and that powerful currents may be generated without and that powerful currents may be generated without bringing dissimilar metals into contact. There is, indeed, every ground for supposing that chemical silinity and electricity are merely modifications of one aminty and electrony are active.

force. (See Electronysis.) The ourrent force of the voltaic battery has been practically applied to many useful purposes. It is employed in telegraphy (which see) to deflect magnetic needless at a distance of hundreds of miles in such a manner that alphabetical signals may be determined by the direction and number of converting iron ber of the deflections. Its power of converting iron bars into temporary magnets of unlimited power has been taken advantage of in the construction of electromotive engines and clocks. (See ELECETRO-MOTIVE Powen; Horology.) Its power of causing chemical decomposition has been turned to account by the metal-worker, the engraver, and the calico-printer. (See Electrotype; Electro-plating and Gilling; Electro Calico-printing.) The current is also much used as a remedial agent in the treatment of many forms of disease of the human body; decided relief has been obtained in paralysis, lock-jaw, St. Vitus's dance, tic-doloreux, and deafness. Though the term galvanism is still commonly applied to the science relating to the current force, it is certainly less appropriate than either rolluic electricity or rolluism, for the observations of Galvani were unimportant compared with those of his great follower, Volta.—Ref. Sir William Snow Harris's Rudimentary Treatise on Galvarism.

ELECTRO CALICO-PRINTING, the art of producing patterns on cloth by the chemical action of the voltaic patterns on cloth by the chemical action of the voltaic current. Many processes of electro calico-printing have been introduced, but as yet they are only used to a limited extent, and it is not likely that they will ever supersede the ordinary effective processes of calico-printing, which depend on chemical action alone. (See Calico-Pennting.) The following example will give the reader a general idea of the electro-chemical methods:—A white pattern is to be printed on a blue ground. The cloth having been wetted with very diluto by dypochlavia acid. is placed on a sheet of tinfoil or hydrochloric acid, is placed on a sheet of tinfoil or other conducting surface connected with the negative electrode of a voltaic battery. A plate of iron, upon which the required pattern has been painted in var-nish, is now connected with the positive electrode of the apparatus, and applied to the cloth. Electro-chemical action is at once set up, and the exposed por-tions of the metallic surface are dissolved by the acid, and the charded is from thus formed becomes fixed in and the chloride of iron thus formed becomes fixed in the cloth. To develop the pattern, the cloth is now passed through a bath of prussiate of potash, which produces a beautiful blue colour wherever the iron has touched, but which does not affect the parts which

touched, but when does not seem the varnish has shielded.

ELECTRO-CHEMICAL THROBY.—In Chem., a theory founded by Davy and Berzelius to account for the chemical changes that take place in substances during their formation or decomposition. It assumes that the constituents of every binary compound are always in opposite electrical states; one being electro-negative and the other electro-positive. When an electric current is passed through such a compound with sufficient force to decompose it, its electro-negative constituent is disengaged at the wire connected with the positive

### Electrode

Electrolysis

been classified according to this theory. Thus hydrogen metals and their oxides belong to the class of electro-positive substances, while the non-metallic ele-ments and the soids belong to the other class. It must be borne in mind, however, that the distinction is only relative, as a substance may be electro-positive to one body, but electro-negative to a third. Sulphur, for instance, is electro-negative to silver, but electro-positive to chlorine.

ELECTRODE, e-lek-trode (Gr. elektron, amber; odos, a way), a term substituted by Faraday for the term pole, as applied to one of the terminations of a voltaic battery. It signifies the way or door by which a current

enters or leaves a substance. (See Electrolysis.)
Electro-Dynamics. (See Electro-Magnetism.) BLECTRO-DYNAMICS. (See MERRY-MARKISE.).

BLECTRO-BYOLING, a mode of etching based upon the destructive action of certain anions upon metals during electrolysis (which see). If two plates of copper be connected with the opposite ends of a voltaic battery and placed in a vessel containing water mixed with a little sulphuric acid, the plate connected with the a little suppuric acid, the plate connected with the positive end will be attacked by the anion oxygen, which is released during the decomposition of the water. This destructive action can be localized at pleasure, by covering certain parts of the plate with a protecting stratum of varnish. Now, as ordinary etching-ground effectually shields a plate from the effects of electrolytic action, it is evident that a drawing traced through the ground in the ordinary manner may be etched without difficulty by exposing the plate to the action of the nascent oxygen. A stout wire must be soldered to the plate; and this, as well as the back of the plate, must be varnished with a solution of shell-lac in spirits of wine. Thus prepared, the plate is placed in a decomposition-cell opposite a plate of somewhat similar size, and the two are connected respectively with the copper and the zinc of a Daniell's respectively with the copper and the zino of a Bannell sor a Smee's cell. (See Batter, Voltaic.) After a lapse of about ten minutes, the prepared plate is removed, for the purpose of "stopping out" the fine parts of the design with Brunswick black. This operation having been completed, the plate is returned for auother space of ten minutes. The half-tints are thus stopped out, and the plate is once more exposed to the action for ten minutes, in order that the stronger lines of the drawing may be deepened. The etching is now completed, and the ground is removed by means of heat. The exact duration of the several exposures, as well as their number, must, of course, be regulated by circumstances. To etch upon iron or steel, a solution of common salt may be used as an electrolyte, and to etch upon silver, a solution of sulphate of silver. The mode of etching above described is, in many respects, superior to the common mode by the use of acids. The whole operation can be conducted with considerable regularity, and can be rendered slow or rapid at pleasure. Again, the plate can be taken out of the decom-position-cell from time to time to be examined, and can be re-submitted to the electrolytic action in a

ELECTROLYSIS, e-lek-trol'-e-sis (Gr. elektron, amber; luo, I loose), a term applied by Faraday to the process of electro-chemical decomposition. The voltaic current of electro-chemical decomposition. The voltaic current has the power of locening and separating the elements of certain compounds when these are interposed in the circuit. The substances which are thus susceptible of decomposition are termed electrolytes. They are all binary compounds, containing single equivalents of their components, which are held together by very powerful affinities. The amount of electrical power required to effect decomposition varies greatly with different electrolytes: solution of iodide of potasium, melted chloride of lead, hydrochloric acid, water mixed with a little sulphuric acid, and pure water, demand very different degrees of decomposing force, the resistance increasing from the first-mentioned sub-

ing perfectly quiescent. Faraday has proposed the terms anode and cathode respectively for the surfaces which are supposed to receive and let out the current which are supposed to receive and let out the current of positive electricity. The anode is therefore directly against or opposite the positive pole of the battery, or, according to Faraday's nomenclature, the positive electrode; and the cathode against or opposite the negative pole or electrode. The bodies which are set free by electrolysis are termed ions. Those ions which to the product of a possite at the positive electrode. go to the anode, and appear at the positive electrode or pole, are distinguished by the term anions, and those which go to the cathode, and appear at the negative electrode, by the term cathions. In the old phraseology of the electro-chemical theory (which see), anions would be called electro-positive bodies, and cathions electronegative bodies, from the assumption that they are under the influence of direct attractive forces residing in the opposite poles of the battery. Faraday has shown by conclusive experiments that the decomposing forces in the state of the s force is not at the poles, but within the substance which is acted on by the current; and the new terms introduced by him express the phenomena actually observed in all cases of electro-chemical decomposition. The following illustrations of electrolysis are particularly striking:—When a pair of platinum plates are plunged into a glass of water to which a few drops of sulphuric acid have been added, and the plates con-nected by wires with the extremities of an active voltate hattery, the water is decomposed into its two consti-tuents, oxygen and hydrogen gases; the former being tuents, oxygen and hydrogen gases; the former being disengaged at the positive electrode, and the latter at the negative electrode. The sulphuric acid is added to the water merely to increase its conducting power. A solution of hydrochloric acid coloured with a little Saxon blue, and treated in the same manner, yields hydrogen at the negative electrode and chlorine at the calific and acid at the same manner. positive, where its presence is made evident by the indigo becoming bleached. Iodide of potassium is decomposed in a similar manner, with still greater ease; and the free iodine at the positive electrode can be recognized by its brown colour or by the addition of a little gelatinous starch, with which it forms a lovely blue compound. The decomposition of water by the voltaic current was first observed by Messrs. Nicholson and Carlisle, and their discovery caused a great sensa-tion in the scientific world. The researches of Davy on the chemical effects of the current led soon after to on the chemical effects of the current led soon after to the great discovery that the alkalies, soda and potassa, and the earths, which had hitherto been regarded as elementary bodies, contained metals. This dis-covery, which was announced in 1807, proved that the voltaic pile was an instrument of immense im-portance in chanical investigations. To Davy's great pupil and auccessor, Faraday, the world is indebted for the clucidation of beautiful phenomena attend-ant on electrolysis. From a very extended series ant on electrolysis. From a very extended series of experiments he was enabled to draw the general inference that the effects of chemical decomposition were always proportionate to the quantity of circu-lating electricity, and might be taken as an accurate and trustworthy measure of the latter. Guided by this important principle, he constructed his voltameter, an instrument which has rendered the greatest service by which a little soidulated water is decomposed by the current, the gas evolved being collected and measured. By placing such an instrument in any part of the circuit, the quantity of electrical force necessary to produce any given effect can be at once estimated; or, on the other hand, any required amount of the latter one be as it ware measured out and adulted to the on the other hand, any required amount of the latter can be, as it were, measured out and adapted to the object in view. Experiments performed with the aid of this instrument led to the important discovery that the relative decomposing effects produced by the same current in different electrolytes is exactly expressed by the atomic weights or chemical equivalents of the electrolytes. Thus if a current be made to traverse demand very different degrees of decomposing force, the resistance increasing from the first-mentioned substance to the last. One of the indispensable conditions of electrolysis is fluidity; for bodies which, when reduced to the liquid state by fusion or solution, recollectrolysis is fluidity; for bodies which, when reduced to the liquid state by fusion or solution, for electrolyses, and readily suffer decomposition, are frequently absolute insulators when solid. When a liquid is electrolysed, its components are disengaged solely at the limiting surfaces, where, scoording to the usual flagrative mode of speech, the current enters and pleaves the liquid, all the intermediate portions appear-lectrical machine, though only on a very minute

This arises from the small quantity of elec scale. This arises from the small quantity of electricity set in motion by the machine, as compared with that generated by the voltaic battery. A pair of small wires of sine and platinum dipping into a single drop of dilute acid develop far more electricity to judge from the chemical effects of such an arrangement, than very many turns of a large plate electricity generated by the machine depend on its tension, or that property which enables it to overcome difficulties, and pass through imperfect conductors. The electroand pass through imperfect conductors. The electrolysis of metallic salts is now carried out on a large scale in the beautiful arts of electrotype and electrolysis (which see). The more recent arts of electroetching, galuanography, and electro culco-printing (see these words), are also based upon the chemical action of the voltaic current .- Ref. Fownes's Manual of Che-

mistry; Harria's Rudimentary Treatise on Galvanism.

ELECTRO-MAGNETISM, e-lek'-tro-mag'-ne-tizm, a important branch of electrical science, which ma 8.0 may be said to have sprung from a discovery made by Professor Oersted, of Copenhagen, in the year 1920. The discovery of the Danish philosopher was thus simply stated:—When a properly balanced magnetic needle stated: - When a properly-balanced magnetic needle is placed in its natural position in the magnetic merian, immediately under and parallel to a wire along which a current of voltaic electricity is passing, that end of the needle which is situated next to the negative side of the battery immediately moves to the west; if the needle is placed parallel to and over the wire, the same pole moves to the cast. When the uniting wire is situated in the same horizontal plane as that in which the needle moves, no declination takes place; but the needle is inclined, so that the pole next to the negative end of the wire is depressed when the wire is situated on the west side, and elevated when situated on the east side. By this discovery the relation of magnetism to electricity, which had long been suspected, was satisfactorily established, and a new and boundless field of research was opened. One of the Faraday, who, reasoning on the fact that the action of a conducting-wire on a magnet is not a directly attractive or repulsive one, was led to the conclusion, that if the action of the voltaic current could be confined to one pole of the magnet, that pole ought, under proper conditions, to rotate round the wire; and conversely, if the magnet were fixed and the conducting-wire movable, the wire ought to rotate round the magnetic movable, the wire ought to rotate round the magnetic pole. Both of these phenomena he realized; and early in 1822 described the apparatus for exhibiting them. The apparatus employed to exhibit the rotation of the movable magnet consisted of a deep cup, nearly full of mercury, in which a cylindrical magnet was placed. The north pole of this magnet was allowed to project above the surface of the mercury, while its south pole was held down by a piece of thread attached to the end of a copper wire, which entered the cup through the centre of the base. The end of a second wire was made to dip into the mercury exactly over that at the bottom of the cup. By connecting the two wires with the two ends of a voltaic battery in action, whree with the two enus of a voiting observery in action, the current was made to pass through the mercury; and the magnet, buoyed up by the mercury, rotated about it. If the positive current descended, the rotation was in the direction from east through south to west: but if the current was made to ascend, then the direction of the motion was reversed. Ampère subsequently caused a magnet to rotate round its own axis; and Barlow devised an ingenious apparatus for exhibiting the rotation of a conducting body round its axis. The first useful application of Oersted's discovery of the reciprocal force exerted between magnetic bars and conducting-wires, was made by Schweigger, a German physicist, in the construction of an instrument for indicating the direction and measuring the intensity for indicating the direction and measuring the intensity of voltaic currents. (See GALVANOMETE.) The laws of electro-magnetic action were fully developed by Ampère, who must be regarded as one of the greatest philosophers of this century. In the course of his investigations he discovered a number of extremely interesting phenomena resulting from the action of all centuring and action.

two currents flowing in the same direction were made to approach each other, strong attraction took place to approach each other, strong attraction took place between them, and when in opposite directions, an equally strong repulsion. These effects have absolutely no relation that can be traced to ordinary electrical attractions and repulsions, from which they must be carefully distinguished. They are purely dynamic, having to do with electricity in motion; and hence they are generally treated of under the head of electro-ture in the electrons. dynamics. Upon those attractions and repulsions of ayamete. Open those attractions and repulsions or conducting wires Ampère founded a most beautiful and ingenious hypothesis of magnetic actions in general, which explains very clearly the influence of the current on the needle. He found that a striking analogy existed between wires conducting electricity analogy existed between wires conducting electricity and magnets, when the former were turned, corkserew fashion, into helices. A helix has indeed all the properties of a magnet, but the direction of the pole at either end will depend on the direction of the turns of the helix; if these be from left to right, then the extremity at which the current enters will have the magnetic properties of a north pole; but if the helix be a left-handed one, then the extremity at which the current enters will have the magnetic properties of a south pole. The analogy extends to fracture. If a magnetic bar be broken in two, each piece is a perfect magnet, and the fractured two, each piece is a perfect magnet, and the fractured parts have opposite poles; so it is with the helix, which, if divided in the middle, exhibits attraction between the fractured ends. Now, according to Ampère's theory of magnetism, the phenomena exhibited by a magnet depend on voltaic currents circulating round its molecules. In their unervited state these round its molecules. In their unexcited state, these molecular currents move in all directions, and thus neutralize one another; but when the bar becomes a magnet, the currents move parallel to each other, and in the same direction, and the effect produced is that of a uniform current moving corkscrew-fashion round the bar, which thus becomes in effect a helix, and the attractions and repulsions are consequences of the actions of the currents on each other. In applying this theory to the explanation of the phenomena of terrestrial magnetism, it is necessary to suppose the incessant circulation of electrical currents round the globe from east to west perpendicular to the maggiode from east to west perpendicular to the mag-netic meridian. (See Magnarism.) A consideration of the influence exerted by electrical currents on magnets naturally led to the conclusion that the neutral condition of bodies susceptible of magnetism would be disturbed by an electrical current, and this conclusion was quickly verified by experiments. When an electrical current is passed at right angles to a piece of tron or steel, the latter acquires magnetic polarity, either temporary or permanent, as the case may be, the direction of the current determining the position of the poles. This effect is prodigiously increased by causing the current to circulate a number of times round the bar, which then acquires extraordinary round the bar, which then acquires extracturary magnetic power. A steel bar may be permanently magnetized in this way, but a bar of pure and soft iron retains the magnetic force only so long as the electrical current is circulating round it. Bars of iron thus temporarily magnetized are called electro-magnets. They are usually horse-shoe shaped, and the conduct ing-wire, which is wound several times round them, is ordinary copper bell-wire, covered with silk or cotton for the purpose of insulation. The power of the electromagnet depends on the dimensions of the bar, the purity of the iron, the intensity of the current, and on the length and thickness of the covered wire. One the length and thickness of the covered wire. One has already been constructed which, when connected with a powerful voltain battery, attracts the iron keeper with a force equal to the weight of more than two tons. When it was discovered that magnets of great power could so readily be made and unmade, attention was naturally given to the application of electro-magnetism as a motive power, and many increase which has been considered with the legislativity was genious models of engines driven by electricity soon genous models of engines driven by electricity soon made their appearance. At the present time, there are many highly efficient electro-magnetic engines in existence, but the expense of working them prevents their application to ordinary purposes. (See Electro-MOTIVE POWER.) The application of electromagnetism to telegraphy has led to marvellous results. electrical currents on each other, which become TRO-MOTIVE POWER.) The application of electroevident when arrangements are made for giving momagnetism to telegraphy has led to marvellous results.
bility to the conducting-wires. He found that when Space and time have, in effect, been annihilated, and

## Electro-Metallurgy

the inhabitants of almost all the large towns of the civilized portions of the globe have been brought, as it were, within speaking distance of each other. A general description of the electric telegraph, with a sketch of the history of telegraphic communication, will be found under the head of TELEGRAPHY. Electromagnetism has been most successfully applied as a motive power to the mechanism of clocks. ROLOGY.) About ten years after Oersted's discovery, Faraday found that electrical currents could be de-veloped in metallic bodies by the action of magnetism. Out of this discovery arose an entirely new branch of electricity, which has been termed Magneto-Electricity (which see).—Ref. Noad's Manual of Electricity; Bir W. Snow Harris's Rudimentary Treatises on Magnetism and Electricity.

ELECTRO-METALLURGY, a comprehensive term for The application of electricity to metal-working. The more important branches of electro-metallurgy are fully described under the heads Electro-type, Electro-type, and Gilding, and Electro-type, Electro-type, and Electro-type, an

TROMETERS.)

ELECTRO-MOTIVE POWER .- The attractive force of the electro-magnet is applied with complete success as a motive power; and machines or engines driven by this force are rather extensively used in the fabrica-tion of mathematical and optical instruments. Compared with steam, electro-magnetism is a very costly agent, and, on this account, it cannot be employed for moving ordinary machinery. For small and delicate machines, however, electro-motive power is so excellently adapted, that its cost is not taken into consideration. ation. Its peculiar advantages are its noiseless action, portability, safety, controllability, and freedom from dirt. The colebrated Russian philosopher Jacobi first constructed electro-motive engines large enough to be practically tested. With one of these, he, in 1839, succeeded in working the paddles of a boat with such force, that the boat, with ten persons on board, attained the speed of four miles an hour. In 1812, Mr. Davidson made some experiments with an electro-motive engine with an electro-motive engine of his invention, and succeeded in propelling a carriage weighing five tons along a line of rails at the rate of four miles an hour. In America, Mr. Davenport and Professor Page successfully applied electro-magnetism to various machines; and in Denmark, Mr. Hjorth, in 1849 took out a nature for an electro-medical control of the contro 1849, took out a patent for an electro-motive engine of 10-horse power, which far surpassed all previous contrivances. To M. Froment, the celebrated mathematical-instrument-maker of Paris, the world is indebted for the proof that electro-magnetism could be advantageously used as a permanent and regular moving power in a large establishment. The electro-motive machines of M. Froment are very various in form, magnitude, and power; but they all derive their motion from magnetism temporarily induced in iron bars by the action of the electric current. (See Electro Magnetism.) By an expedient to which an infinite variety of forms may be given, the current round each iron bar, or electro-magnet, can be alternately transmitted and suspended with any desired degree of rapidity; and, by varying the power of the battery, the length of the coiled wire, and the magnitude of the bar, a magnetic force of any desired intensity can be produced. A piece of iron, called an armature, is presented to one or both of the poles of the electro-magnet, towards which it is attracted while the current is transmitted, with a force proportionate to the intensity of the magnetism; and when the current is suspended, the armature either falls from the magnet by its own weight, or is with drawn from it by the action of a spring or other mechanical arrangement provided for the purpose. The armature may be placed between two magnets, so as which is transmitted round each in the intervals of its suspension round the other. The armature will then be moved alternately to and fro between the two mag-nets. In this manner, by alternately suspending and transmitting the gureant on the wive which is called round the electro-magnet, the magnet and its armature receive an alternate motion to and from each other, similar to that of the piston of a steam-engine or the foot of a person who works the treadle of a lathe. This alternate motion is made to produce one of continued

## Electro-plating and Gilding

rotation by the same mechanical expedients as are used in the application of any other moving power. The force with which the electro-magnet and its armature attract each other determines the power of the electromotive machine, just as the pressure of steam on the piston determines the power of a steam-engine.— Ref. Lardner on Electro-Motive Power, in Museum of Science and Art. The construction of several of M. Froment's ingenious contrivances is there plainly described.

ELECTROPHORUS, e-lek-trof'-o-rus (Gr. elektron, and phoreo, I bear), a valuable instrument for exciting electricity, devised by Volta. In the chemical laboratory it is generally used instead of an ordinary electrical machine for charging small Leyden jars, when mixtures of gases have to be exploded by the electric spark. To construct it, a plate of tin is made into a circle of about twelve inches diameter; a raised border is then turned up for about half an inch, and the extreme edge is turned outwards over a wire, so as to avoid a sharp border. A mixture of equal weights of shell-lac, Venice turpentine, and resin, is made by gently heating them together until well fused, stirring during the time with a stick, so as to thoroughly incorporate the ingredients. The composition should, when perfectly homogeneous, be poured into the plate with the raised edges until it a suite full, and the composition is to be but mitted. is quite full, and the composition is to be kept melted, but not too hot, until the hubbles have entirely disap-peared. The second portion of the instrument, or that which serves the place of a conductor, consists of a flat circle of wood, rounded at the edge, and neatly covered with tin-foil: it is rather smaller than the resinous plate. An insulating handle, formed of a piece of stout glass rod, is cemented into the centre of the wooden disc. Before using the instrument, it must be carefully dried and stightly warmed. The resinous surface fully dried and signify warned. The resinous surned is to be excited by beating with a piece of warm flamnel. To do this effectually, the latter is to be folded into a slip about fourteen inches long, and, being grasped by one end, is to be struck upon the resinous surface smartly, and in an oblique direction, much in the manner of beating dust off a flat surface. When this has been done for about a minute, the warm dry cover or upper plate of the instrument is to be placed upon the resinous cake, and touched with the finger. If the cover is then raised a few inches, and the knuckle approached, a powerful spark of positive electricity will pass; and if the cover be again replaced, touched, and raised, a second spark will pass. This may be repeated many times without again exciting the resinous plate, for the electricity of the cover is not derived in the way of charge from the resin, but is the result of the process of inductioe. By substituting the knob of a Leyden jar for the knockle, in order that it may receive a spark after each raising of the cover, the jar may be quickly charged sufficiently to give a powerful shock, or to cause the explosion of a gascous mixture. The electrophorus is sometimes termed the perpetual electrical machine.

ELECTRO-PLATING AND GILDING, the arts by which silver and gold are deposited in thin films upon the baser metals through the agency of electricity. idea of working in the noble metals by electricity was naturally suggested to several experimentalists simultaneously by the beautiful results obtained with copper. (See Electrotype.) The early attempts at copper. (See EBECTROITES.) In carry attempts as electro-plating were, however, somewhat discouraging; for although De la Rive, C. V. Walker, and others, succeeded in obtaining deposits, they could only get deposits of the proper character when they chanced to have in action a power nicely balanced with the work to be performed. The first practical process of electro-plating was introduced by the Messra. Elkington, of Birmingham, who have obtained patent rights for this and many other processes of electro-metallurgy. They employ solutions of the argento-cyanide and the aurocyanide of potassium as electrotypes, from which silver and gold are respectively separated. These compounds are what chemists term double salts; for instance, cyanide of potassium is simply a compound of potassium is silver and cyanogen; but argento-cyanide of potassium is silver and cyanogen combined with potassium and cyanogen, or, what amounts to the same thing, cyanide of silver united with cyanide of potassium. When a solution of this double cyanide is electrolyzed (see ELECTROLYSIS), silver appears at one electrode and

cyanogen at the other, while a proportionate amount of the simple cyanide of potassium is formed in the solution. But if the positive electrode is silver, the cyanogen combines with it and forms cyanide of silver, which unites with the liberated cyanide of potassium, and so keeps up the strength of the solution. In the great electro-plating establishments of Birmingham large oblong vats are used as decomposition-cells: some of these contain from 200 to 250 gallous of the alivering solution. Silver plates, connected with the positive end of the voltaic apparatus, are placed at intervals in the vats: they correspond in extent of surface with the articles to be coated, and face them on both sides. Two brass rods, connected with the negative end of the apparatus, are laid over each vat lengthways, and from these the articles to be coated are Two brass rods, connected with the suspended by copperwires. Almost all the articles which are commonly electro-plated, such as teapots, cruetare commonly electro-plated, such as teapots, cruet-frames, candleaticks, spoons and forks, are formed of nickel silver or German silver, an alloy of copper, zinc, and nickel: this chosen chiefly on account of its silvery whiteness, a quality of great importance when portions of the coating of noble metal have been worn away by use. The articles to be plated are first boiled in a solution of potash, to free them from grease; they are then unickly dinued in red nitrous acid, to remove any then quickly dipped in red nitrous acid, to remove any oxide that may have formed on the surface, and, after this, twice washed in different tanks of water, to remove every trace of the acid. After having been carefully weighed, they are suspended from copper wires and dipped into a solution of mercury in cyanide of potassium, then again twice washed in different tanks of water, and then they are ready for immersion in the silvering solution. Here they are left until the operator has reason to believe that nearly a sufficient amount of silver has been deposited on them, when he removes a test article and weighs it, to ascertain the exact condition of the others, and how much longer they require to remain in the solution. Any thickness of silver may, of course, be given to an article by con-tinuing the operation sufficiently long; but from three to six hours generally suffice to give a proper coating:
1\frac{1}{2} ounce of silver to the square foot of surface is considered to form an excellent plate. In some establishments the silvering solution is kept constantly stirred by simple mechanical arrangements. The silver-plated articles, on being removed from the vats, are well brushed with brushes of very fine brass wire attached to a lathe, and cleaned with fine Calais sand; they are afterwards polished on revolving brushes with rottenatone, then by hand with soft leather and ronge, and lastly with the naked hand. The finishing opera-tion is always performed by women, who, from the greater softness and delicacy of skin, excel men in the art of polishing. Articles with fluted, chased, and ornsmented surfaces, are often burnished after being polished. The burnisher is a piece of highly-polished hardened steel, sometimes of bloodstone, flint, or agate, fitted to a handle; and when judiciously applied agete, fitted to a handle; and when judiciously applied to smooth metallic surfaces, it imparts to them, by friction, an exceedingly brilliant and lasting polish. The process of electro-gilding is nearly the same asthat of silvering, but, of course, plates of gold are suspended in the solution instead of silver plates. Professor Wood, of Springfield, Massachusetts, has communicated the following recipes, which are calculated to be of the greatest service to the electro-metallurgist. The professor observes:—"I believe it is the first time that a solution for plating direct on iron, steel, or Britannia metal has been published. In most of the experiments I have used Smee's battery; but for depositing brass I prefer a battery fitted up as Grove's, positing brass I prefer a battery fitted up as Grore's, using artificial graphite—obtained from the inside of broken coal-gas retorts—in the place of platinum. With one large cell (the zinc cylinder being 8 × 3 inches, and excited with a mixture of one part sulphuric acid and twelve parts water, the graphite being excited by commercial nitric acid) I have plated six gross of polished iron buckles per hour with brass. I have also coated type and stereotype plates with brass and find it more durable than comper brass, and find it more durable than copper facing. To prepare Cyanide of Silver.—1. Dissolve 10 z. of pure silver in 2 oz. of nitric soid and 2 oz. of hot water, after which add a quart of hot water. 2. Dissolve 5 oz. of the cyanide of potassium 747

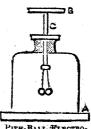
## Electroscopes and Electrometers

in 1 quart of water. To the first preparation add by degrees a small portion of the second preparation, until the whole of the silver is precipitated, which may be known by stirring the mixture and allowing it to settle. Then drop into the clear liquid a very small to settle. Then drop into the clear liquid a very small quantity of the second preparation from the end of a glass rod; if the clear liquid is rendered turbid, it is a proof that the whole of the silver is not separated; if, on the other hand, the liquor is not altered, it is a proof that the silver is separated. The clear liquid is now to be poured off, and the precipitate, which is the cyanide of silver, washed at least four times in hot water. The precipitate may now be dried and bottled for use. To prepare Cyanide of Gold.—Dissolve 1 oz. of fine gold in 1.4 oz. of nitric acid, and 2 oz. of muriatic acid, after it is dissolved, add 1 quart of muriatic acid; after it is dissolved, add 1 quart of hot water, and precipitate with the second preparation, proceeding the same as for the cyanide of silver. To prepare Cyanides of Copper and Zinc.—For copper, dissolve 1 oz. of sulphate of copper in 1 pint of hot water; for zinc, dissolve 1 oz. of the sul-phate of zinc in 1 pint of hot water, and proceed the same as for the cyanide of silver. The electroplater, to insure success in plating upon all metals and metallic alloys, must have two solutions of silver; the first to whiten or fix the silver to such metals as iron, steel, Britannia metal, and German silver; the second to finish the work, as any amount of silver can be deposited in a reguline state from the second solution. First, or Whitening Solution.—Dissolve 2; lb. troy of cyanide of potaseium, 8 oz. of carbonate of sods, and 5 oz. of cyanide of silver in 1 gallon of rain or distilled water. This solution should be used with a compound battery, of three to ten pairs, according to the size of the work to be plated. Second, or Finishing Solution.—Dissolve 4; oz. troy of cyanide of potassium and 10 oz. of cyanide of silver in 1 gallon of rain or distilled water. This solution should be used with one large cell of Smee's battery, observing that the silver plate is placed as and metallic alloys, must have two solutions of silver; solution should be used who one large cell of since a battery, observing that the silver plate is placed as near the surface of the articles to be plated as possible. N.B. By using the first, or whitening solution, you may incure the adhesion of silver to all kinds of brass, may insure the adhesion of silver to all kinds of brass, bronze, red-cock metal, type metal, &c., without the use of mercury, which is so injurious to the human system. To prepare a Solution of Gold.—Dissolve 4 oz. Troys of cyanide of potassium and 1 oz. of cyanide of gold in 1 gallon of rain or distilled water. This solution is to be used warm (about 90° Fahr.) with a battery of at least two cells. Gold can be deposited of various shades to suit the artist, by adding to the solution of gold a small quantity of the cyanides of silver, copper, or zinc, and a few drops of the hydrosulphuret of ammonia.

Electrometers. e-lek-tro-

ELECTROSCOPES AND ELECTROMETERS, e-lek'-tro-scopes, e-lek-trom'-e-ters (Gr. elektron, and skopeo, I see, or metree, I measure), instruments constantly employed in electrical investigations. The distinction hetween the electroscope and the electrometer is often disregarded by scientific writers. Strictly speaking. the former is an instrument for simply rendering electrical excitation apparent by its effects, and the latter an instrument for measuring electrical forces. Any light body delicately suspended may be used as an electroscope. A pith ball hanging by a fine silk thread from a convenient stand is very frequently employed.

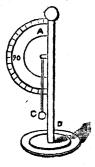
Another form of this instru-



ment consists of two pith balls hung by threads, or very fine metal wires: when excited, the balls diverge in virtue of their mutual repulsion. As the currents of sir render the indications of the pith balls obscure when they are left unprotected, it is found better to enclose them in a glass cy-linder. The annexed woodcut illustrates the arrange-

## Electroscopes and Electrometers

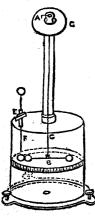
electricity is diffused along the metallic rod C, and reaching the pith balls, they become similarly electrified and repel each other. Bennett's gold-leaf electroscope—a much more delicate instrument, and one of great value in all electrical investigations—consists of two slips of gold-leaf suspended parallel to each sets of two sups of gold-less auspended parallel to each other within a glass receiver, and communicating with a metal cap or disc above. When the cap is touched with an electrified body, the leaves separate, but instantly collapse when a second body charged with the opposite kind of electricity is brought near the cap. The oldest form of the electrometer consists of a vertical conducting-rod with a movable reed arm terminating in a light pith ball, and working over a graduated quadrant or emicircle. The instrument is generally attached to the prime conductor of the electrical machine, and, when charged, the vertical rod repels the reed arm, which rises in the air, and marks on the graduated semicircle This instrument is known as the angle of divergence.



Henley's quadrant electro-meter. Cavendish constructed an excellent electrometer, with two slender reeds terminating with two cork balls, the divergence of which was indicated by a scale. In Coulomb's torsion-balance the force of electrical repulsion is esti-mated by the reactive force of a fine wire suspended vertically, and twisted more or less from its quiescent position. M. Coulomb's most ingeniously contrived instrument consists of a slender bar (B) formed of melted shellac, furnished with a gilt pith ball at one end, and a little vane

HENLET'S ELECTEOMETER.

"This," says Mr. Charles
Brooke, in his edition of
Golding Bird's Natural Philosophy, "is suspended by
a fine metallic wire (0), or still better, by a filament
of spun glass, in the middle of a cylindrical cage of
class. The pupus and of this wire. The upper end of this wire, or glass thread, terminates in a key (D),



COULOMB'S TORSION-BALANCE.

furnished with an index, and capable of moving in the centre of a circle (G), graduated into 360°. Through a hole (E) at the top of the glass cage a rod of lac (F), terminating in a gilt ball, is inserted, being prevented from falling in by a stop at E. This hall is generally termed the carrier ball, on account of its being used to convey the electricity of an excited body to the electrometer, so that its potential may be determined. To use this instrument for measuring the amount of electricity, the rod F is removed, and its ball brought in contact with the substance to be examined. The ball acquires some active electricity, and on being placed in the glass cage it shares its electricity with the ball terminating the horizontal needle B;

## Electrotype

degrees described by the index fixed to the revolving key D gives an approximation to the amount of elec-tricity acquired by the ball F during its contact with the electrified body." Harris's bifilar balance may be the electrified body." Harris's bitilar balance may be regarded as a modification of Coulomb's. A very simple, as well as efficient, form of electroscope is that invented by Dr. Hare, of Philadelphia. A thin strip of gold leaf is suspended within a glass globe. Directly opposite the end of this gold leaf a small brass rod passes through the side of the globe, upon which is a gilt disc of paper or wood. With this instrument both the presence and the kind of elecinstrument both the presence and the kind of electricity may be detected. "In the use of this instrument care must be taken to preserve a dry atmosphere within the glass receiver, which may be, if required, removed from its foot and held over a warm iron. The glass also about the openings through which the brass rods pass should be carefully varnished. With proper care it is quite astonishing how sensitive the instrument becomes to the smallest electrical force. (Harris.) There are many electrometers for esti-(Harris.) There are many electrometers for esti-mating the quantity of accumulated electricity in Leyden jars. Of these the most useful are the dis-charging electrometers of Lane and Cuthhertson, and the unit-measure and quantity-jar of Sir W. S. Harris. For descriptions and figures of all the more im-

portant electroscopes and electronometers, refer to Harris's Rudimentary Electricity.

ELECTROTYPE, e-lek'-tro-tipe (Gr. tupos, an impression), the term commonly applied to the ert of depositing copper and other metals in or upon suitable moulds, through the agency of voltaic electricity, so as to produce faithful copies of coins, medals, statues, engraved blocks, and other works. For this art we are indebted to Professor Jacobi, of St. Petersburg, and Mr. Spencer, of Liverpool, who almost simultaneously invented similar processes for moulding the copper released during the electrolysis of the sulphate, into beautiful or useful forms. The following examples of electrolysis (see this word) will elucidate this important branch of electro-metallurgy. If two platinum plates be connected with the opposite ends of a voltaic battery in action, and be placed in a vessel con-taining water and sulphuric acid, the water will be taining water and sulphurio acid, the water will be electrolyzed, or decomposed by electricity: the hydrogen gas will be released at the plate connected with the negative end of the battery, and the oxygen at that connected with the positive. If into the acid liquid some crystals of sulphate of copper (blue vitriol) be now thrown, electrolysis will still take place, but only one of the elements of the water, namely oxygen, will be evolved; for the hydrogen, on being released from the water, will take the place of the copper in the solution, and the copper thus liberated will be deposited on the negative plate. This experiment may deposited on the negative plate. This experiment may be continued until all the copper is abstracted from the solution. If a copper plate be now substituted for the solution. If a copper plate be now substituted for the platinum one, forming the positive electrode, the water will be decomposed, but neither of the gases will escape. The hydrogen, as before, will take the place of the copper in the solution; the oxygen, instead of appearing at the positive plate, will combine with the copper of which that plate is composed, forming oxide of copper, which will unite with the sulphuric acid to form sulphate of copper. The chemical forces called into action by the current are so heautifully balanced that, in the last experiment, the quantity of copper supplied by the positive plate equals exactly the quantity withdrawn from the solution and deposited on the negative plate. The practice of electrotyping cousists negative plate. The practice of electrotyping consists in preparing models or moulds of objects to be copied, and in so arranging the battery, or apparatus which generates the voltaic current, as to deposit the metal in a compact and solid form upon these models. There are many materials fitted for forming electrotype-moulds; of these, fusible metal, wax, stearine, plaster of Paris, and gutta-peroha, are mostly used. Non-metallic moulds are rubbed over with plumbago or black, bad which is an argulant confluctor of leartingity. The the horizontal needle B; moulds; of these, fasible metal, war, stearine, plaster of Paris, and gutta-percha, are mostly used. Non-metallic moulds are rubbed over with plumbago or black. B necessarily moves, and describes a certain angle, but it retains until it loses its electricity. To measure the amount of energy thus acquired by the balls, the key D, to which the glass thread C is fastened, is turned round, until, by the torsion or twisting of the thread, the ball of B is compelled to some in contact with that of F. Then the number of trotyping is a single cell of a Daniell's battery, alightly

modified. (See BATTERY, VOLTAIC.) In a vessel of stoneware or glass is placed a tube or cell of porous earthenware, and in this a plate or rod of amalgamated zinc. A perforated shelf for holding crystals of sulzino. A periorated shell for holding crystals of sulphate of copper is fixed in the upper part of the outervessel. The prepared mould which represents the copper or negative element of an ordinary voltaic pair is connected by a wire with the zino, and suspended in the outer vessel. To charge the apparatus, the porous cell is filled with a mixture of water and sulphuric acid; the outer vessel with a mixture of water and sulphuric acid; the outer vessel with a saturated solution of sulphate of copper, with a little sulphuric acid in it; and the shelf is well furnished with crystals of sulphute of copper to keep the solution saturated. Certain precautions must be observed in using this apparatus. Thus the mould must not be too small in proportion to the size of the zine; for when this is the case the copper is deposited as a dark powder. Again, it must not be too large, because then the copper is deposited very slowly, and is of a brittle texture. The singleapparatus is now only used for copying medals, seals, and other small works. For electrotyping large objects, or for operating upon a number of small moulds, a separate decomposition cell is used, with a single cell of a Daniell's or a Smee's battery for producing the current. The decomposition cell is filled with a dilute acid solution of sulphate of copper. Two brass rods, connected respectively with the zinc and copper (or platinized silver) of the generating-cell, are laid across the top; to one of these the moulds are attached, and to the other a plate or plates of copper. By a series of chemical changes, to which reference has already been made, the copper from the solution is transferred to the moulds; and the copper plates are dissolved with such regularity, that the strength of the solution is kept up. The useful pur-poses to which the electrotype process is applied are numerable. It is used for copying busts and statues; for manufacturing pipes without seams, boilers, stempars, and other vessels of copper; for reproducing the plates used to print Bank of England notes; for making casts from metal type and woodcuts; to form rollers of copper for printing or embossing calicoes; to give strong coatings of metal to fragile glass vessels, such as chemical retorts and flasks; to prepare metallic lace and cloth; and to cover delicate flowers and minute insects with durable films of copper.—Ref. C. V. Walker's Electrotype Manipulation.

ELECTRUM, e-lek'-trum (Gr. elektron, suber), a term read by the Greeks to depote suber, and supplied by

used by the Greeks to denote amber, and applied by the Romans to this substance and to an alloy of gold and silver containing three or four parts of the former to one of the latter. The metal thus formed was characterized by great lustre and brilliancy. At the pre-sent day the term is often used to denote German

silver.

ELECTUARY, e-lek'-tu-a-re (Lat. eligo, I make choice), in Med., is a form of preparing certain remedies, such means of syrup or honey, so as to be easily taken off a teaspoon or the point of a knife, or without their natu-

rally unpleasant taste being perceived.

ELREMOSYNARY, el-ee-mos'-e-nê-re (Gr. eleemosune, alms), of or belonging to alms or charity. In the early church, the eleemosynamus, or almoner, was a peculiar officer, who received the eleemosynary rents and gifts, and distributed them to pious and charitable uses. In Law, eleemosynary corporations are corporate bodies constituted for the perpetual distribution of the free alms or bounty of the founder of them, to such persons as he has directed. Of this kind are all hospitals for the maintenance of the poor, sick, and impotent, and all colleges, both in our universities and out of them.

all colleges, both in our universities and out of them. ELEGI, ele', jt (Lat. eligo, I choose,—because it is the choice or election of the plaintiff), in Law, is the name of a writ of execution founded on the Statute of Westminster the Second, by which, after a plaintiff or defendant has obtained judgment in an action, the sheriff gives him possession of the lands and tenements of the opposite party, to be occupied and enjoyed until the money due on such judgment is fully paid, and during that period he is tenant by elegit. By the common law, a man could only have satisfaction of the goods, chattels, and present profits of lands, but not possession of the lands themselves. To remedy this,

the above statute was passed, by which not only are the defendant's goods and chattels (except oxen and beasts of the plough) delivered over to the plaintiff, but if there are not sufficient to satisfy the debt, then but in there are not sumctent to satisfy the debt, then the sheriff shall make delivery of a moiety of the de-fendant's land to be held until the whole debt and dumages are paid and satisfied. This statute was altered by 1 & 2 Vict. c. 110, which enables the plaintiff by this writ to seize the whole, instead of only half of the defendant's lands and tenements. Upon this writ the sheriff impanels a jury, who appraise the debtor's goods and lands, and if the former are insufficient to pay the debt, then the latter are also delivered over to the creditor.

ELEGY, el'-e-je (Gr. elegos, from e, and legein, to cry alas!), a term applied, in modern English language, to a short poem composed on a mournful occasion, genea short poem composed on a mournisi occasion, generally on some one's death. Amongst the ancient Greeks, the elegos was a strain of lament, and usually consisted of a poem made up of alternate hexaneter and pentameter verses. The elegiac was also the favourite metre for epigrams. It was used, however, by different poets in different ways. The elegics of Callinus and Tyrtsus are political and warlike; those of Minnermys are contemplative and melancholy: of Mimnermus are contemplative and melancholy; those of Theognis and Solon are moral and political, &c. The first Latin elegiac writer of note was Catullus, and he was followed by Tibulius, Tibutius, and Ovid. The elegiac verses of Catulius are either mournful or satirical, while those of the other poets of the Augustan ers are devoted to subjects connected with successful or unsuccessful love. In more modern times, the poets of nearly every nation have practised this species of composition. Amongst the most successful in this country may be mentioned the Elegies of Hammond, the Lycidas of Milton, and Gray's Elegy.

ELEMENTS, el'-e-ments (Lat. elementum), in Chem .-An element may be defined as a substance which can-not be resolved into others. The ancient philosophers imagined earth, sir, fire, and water to be elements, by the combination of which all other substances were the combination of which all other substances were formed. Modern chemistry has, however, proved that air, earth, and water are compound bodies, and that fire is an effect, and not a substance. The number of substances which cannot be further resolved by chemists are provisionally termed by them elements, it being by no means improbable that many of them are compound hodies. In the present state of knowledge, they are about sixty-five in number, and are divided broadly into the non-metallic and metallic elements. broadly into the non-metallic and metallic elements; these two divisions somewhat running into each other The following is a list of the elements divided in this

manner :-

## Non-metallic Elements.

Name,	Symbol.	Equivalent.
Boron	B	10.9
Bromine	Br	80
Carbon	C	12
Chlorine		
Fluorine		19
Hydrogen		
Iodine		127
Nitrogen		
Oxygen		16
Phosphorus		
Sulphur		
Selenium		
Silicon		
Tellurium		

Dr. William Allen Miller, in the last edition of his valuable "Elements of Chemistry," makes the following general arrangement of the metallic elements:—

I. Alkali Metals-5 in number.

3. Lithium 5. Rubidium 1. Potassium 2. Sodium 4. Cesium

II. Alkaline Earth Metals-3 in number.

1. Barium 2. Strontium 3. Calcium

III. Earth Metals-8 in number.

4. Erbium 7. Lanthanum 1. Aluminium 2. Glucinum 5. Terbium 8. Didymium 3. Yttrium 6. Cerium

## Elements

# IV. Magnesium Metals-3 in number.

#### 1. Magnesium 2. Zino

3. Cadmium

- V. Metals more or less analogous to Iron-6 in number. 1. Cobalt 2. Nickel 3. Uranium 5. Chromium
  - 4. Iron 6. Manganese

## VI. Metale which yield Acids-12 in number.

- 1. Tin 2. Titanium 5. Molybdenum 9. Vanadium
  - 6. Tungsten 10. Arsenicum
- 3. Zirconium
- 7. Niobium
- 4. Thorinum 8. Tantalum
- 11. Antimony 12. Bismuth

## VII. 4 Mctals.

#### 1. Copper 2. Lead 3. Thalliam 4. Indium.

## VIII. Noble Metals-9 in number 1. Mercury

- 4. Platinum 5. Palladium
- 7. Ruthenium
- 2. Silver 6. Rhodium 3. Gold
- 8. Osmium 9. Iridium

The following are only of scientific importance, no use having as yet been found for them. Some of them, such as palladium, rhodium, iridium, and one or two more, would be exceedingly valuable but for their rarity.

Name.	Symbol.	Equivalent.
Cæsium	Св	
Cerium	Се	47
Didymium	D	
Erbium	E	
Glacinum		
Ilmenium (?)	1i	
Iridium		99
Lanthanum	La	
Molybdenum	Мо	46
Niobium (?)	Nb	
Osminm		
Palladium		53·3
Pelopium (?)		
Rhodium		52*2
Rubidium		
Ruthenium		
Tantalum		
Tellarium		61.2
Terbium		•
Thallium		
Thorium		
Titanium		
Yanadium		63.6
Yttrium		
Zirconium	Zr	23.4

ELEMENTS, those numerical quantities, obtained by observation and calculation, which are used in compiling tables that exhibit the ephemeris of a planet's motions. The principal are its greatest, mean, and least distance from the sun; its mean daily motion; its mean annual motion; the eccentricity of its orbit and its inclination to the ecliptic; the longitude of its seconding node and perihelion; and its mass and density.

ELEPHANT, el'-e-f'unt (Elephan).—This is the largest of existing Pachydermata. In ancient times the most curious notions were entertained concerning it, not the least quaint being that it had no joints. Aristotle and Pliny were firm adherents to this doctrine. There can be little doubt that this delusion sprung from the fact that the elephant seldom lies down either in a wild or captive They have been surprised by hunters standing and yet fast asleep. Captain Denman so encountered and shot an elephant. With regard to its disnicination to lie down when domesticated, it is recorded that one belonging to Louis XIV, never assumed any but a standing position during five years. In this case, however, there was evidence that other than natural causes impelled the elephant to remain on his legs; for he was at great pains to scoop in the stone walls for he was at great pains to scoop in the stone walls of his house two deep holes, in which he inserted his tasks before sleeping. Were the elephant's less formed like those of other quadrapeds, the labour of round like those of other quadrapeds, the labour of the this valuable organ. Some time ago one was containing his immense carcass from the ground might in a menageric at Dublin, and by some misformatic formed like those of other quadrapeds.

## Elephant

account for his dislike to a recumbent position; but account for his dislike to a recument position; but his structure is such that lying down and rising are matters of but little difficulty. Instead of bringing his hind legs under him when he lies down, he extends them behind him, in the position of a kneeling human being; when he wishes to rise, he simply draws his hind feet gradually under him, and his enormous weight is levered up with perfect case. This mobility of limb is of west service to the slenbart in the nerform of limb is of vast service to the elephant in the performance of his duty as a beast of burden; and with a howdah on his back containing eight or ten persons, and the driver on his neck, he can descend steep hills with perfect safety. He manages in this way: kneeling down at the commencement of the declivity, he puts out one fore-leg and feels cautiously for a safe foot-ing; if he does not find it, he hanners at the soft soil with his heavy foot until he has made an indentation sufficient to secure firm footing. One foot thus accommodated, the other is drawn out with equal care, and provided for in the same manner as the first. Then one of the hind legs is cautiously drawn forward and one of the first feet being released from the foothole, it is inserted in its place: and all this is performed so rapidly that it might be repeated at least three times in as little time as it takes to write this explanation. It is almost needless to observe that the elephant is distinguished by the possession of a long



ELEPHANT.

trunk or probosus, which serves him in place of a hand, and enables him to perform many extraordinary Without this carious appendage he would find feats. Without this curious appeniage he would mut existence difficult, if not impossible. Elephants some-times go blind while in a state of freedom, but, guided by this exquisite organ of touch, they are still en-abled to make their way through dense forests, to gather food, and to avoid ditches and hollows. The elephant's trunk is not composed of a mere series of muscular rings, as its appearance would lead one to suspect. It has three perfect and distinct uses. As an organ of smell, it is an elongated and curiously clastic nose. Within it two canals are continued from the nostrils, which are reflected round the nasal bones and then proceed straight to its end. These canals are separated by, and embedded in, a fatty elastic membrane containing thousands of minute muscles. Of these there are threesets,—an outer longitudinal, com-posed of four layers; an oblique set, which are variously directed; and a third set, which radiate from the tubes to the circumference. They are very small, and supposed to number as many as forty or fifty thou-sand. Besides as an organ of smell, the elephant's trunk serves as a sucker, by which the great animal may quench his thirst at the shallowest pools. There is no passage from the trunk to the mouth; but the former may be filled, and then, the mouth of it being

gradually from the shoulder to the middle, and thence descending to the insertion of the tail; all his joints firm and strong." It is conjectured that elephants attain their full growth at about their twentieth year. Their size has been greatly exaggerated. In for times it was thought a common thing for the elephant times it was thought a common thing for the captains.

to reach a height of twenty feet; but it is now pretty certain that ten feet is tail, and twelve feet an extraordinary height for one of these animals. Among the Singhalese the belief is still prevalent that the elephant attains the age of two or even three hundred years; it, however, is a tolerably well-ascertained fact that the duration of life in these animals is from seventy to eighty years. There are records of the elephant tiving to a greater age than this. Amongst the papers of Colonel Robertson (son of the historian of Charles V.), who held a command in Ceylon in 1799, shortly after the capture of the island by the British, showing that a decoy was then attached to the elephant establishments at Maturs, which the records proved to have served under the Dutch during the entire period of the occupation (extending to upwards of 140 years), and was said to have been found in the stables by the Dutch, on the expulsion of the Portuguese in 1656. The number of elephant tasks brought to England is very large. In Sheffield alone it is stated that upwards of 46,000 tasks are annually consumed. The workers in ivory in that town are above 500 in number, and the value of the ivory about £30,000 per annum. It may be worth while here to remark that the well-known Indian-yellow, or Purree, is held to be a commendant

the earthy phosphate and urea deposited from the urine of the elephant.—Ref. Wild Sports of the World. RLEPHANTIASIS, OF BARBADOES LEG, el-e-fan-ti-d-sis (Gr., from elephas, an elephant), is the name of a discase common in the East and West Indies, and so called from the skin of the afflicted limb becoming rough, scaly, and enormously thickened, so as to re-semble the leg of an elephant. It generally comes on with great heat of the skin, alternating with profuse perspiration and ardent thirst. The part becomes red, herspiration and ardent thirst. The part becomes red, hot, swelled, and painful, increases to great size, and becomes a burden to the patient. Though it is the leg that is generally affected by this disorder, other parts of the body are liable to its attack; but it is not usual for more than one part to be morbidly enlarged in the same individual. In the treatment of this disease of its earlier stages the use of laxatives and disphoretise recommended, together with the application in iodine ointment to the part, and firm bandaging.

Indian-yellow, or Purree, is held to be a compound of

ELEUSINIAN MYSTRIBS, el-su-sin'-e-in mis'-ter-ees, a term applied by the ancient Greeks to the festival and sacred rites originally celebrated only at Athens and Eleusis, in honour of the goddess Ceres. It was considered the holiest and most venerable of all the festivals of Greece. There are several traditions current as to its origin; and many of the mysteries are unknown, as they were so superstitiously observed, that any person who revealed any of the religious cere-monies was put to death. The first Eleusinan festivals are generally attributed to a tradition that Geres, or Demeter, as she was called by the Greeks, while seek-ing for her lost daughter Persephone, overwhelmed with grief and fatigue, rested upon a stone called "the sorrowful stone," near a well at Eleusis. Round this well the Eleusinian women first sang their choruses, and instituted the first mysterious rites. In after-time the festival was divided into two classes,—the greater and lesser mysteries. The latter was considered a preparation for the former, and was held at Agræ, on the Ilissus. The celebration at Eleusis commenced in the third month of the Attic year, and lasted about nine days. The initiated were called epoptai or ephuroi. On the first day those who had been initiated in the was called aguris, 'an assembly.' A large number of etrangers also crowded to Athens at the same time. On the second day the initiated purified themselves by ablations; hence it was called alade mysta,—' to the sea, ye initiated!' Very little is known with certainty about the proceedings on the third day. It seems to have been held as a day of fasting, a frugal meal of cakes made of serame and honey being taken in the evening. Sacrifices were

it was found almost to a depth of two feet into the hard floor of the den. The dentition of the elephant is of a very remarkable nature. From the upper jaw extend very remarkable nature. From the upper jaw extend two enormous teeth fixed in sockets in the front of the mouth, but which, in fact, are neither increors nor tusks, although by the latter term they are generally known. They spring, however, from the intermaxillary bones, and must be regarded as the representatives of the incisors. They grow from a permanent pulp, and continue to increase in size during the life of the animal. The incisors are wanting in the lower jaw, as are also the canines in both jaws; and the only other teeth possessed by this immense quadru-ped consist of two molars of a most remarkable structure on each side of each jaw. These teeth are of a very large size, and a quadrangular form. They consist of a series of plates of the ordinary substance of teeth (dentine), each coated with a layer of enamel, and united together into a mass by a material called the coment. The form of these transverse plates of dentine and enamel varies greatly in the different species. The formation of the molar teeth, like that species. The formation of the moint recent, and con-of the tasks, is going on as long as the elephant lives; but with this difference, that whilst after shedding the first or milk tusks, the pulp of each tusk continues adding matter to its base without any change, in the case of the molars it is a succession of separate teeth that is produced, the hindermost pressing gradually forward to take the place of those which have been abraded by use, and cast off as unserviceable. The period of ges-tation of the elephant is a few days over twenty months. The breasts of the female are placed under the chest, and the young one sucks not with the trunk but with the mouth. The strongest proof of the elephant's antipathy to a recumbent position may be drawn from the fact that although the new-born calf is much too short to reach the test, the mother, rather than lie down, will extend her legs so as to bring her breast nearer the earth. In a state of domesticity, the elephant-keeper will, under such circumstances, build a little platform of earth for the elephant-calf to stand on while it sucks. At its birth, the calf is about thirty-six inches in height. Weaning a young olephant is, by all accounts, a formidable undertaking. A colebrated English traveller thus describes the business :-"About two-and-thirty females with their young ones were driven into the inclosure, and shortly afterwards there also went in four great male clephants, the riders of which had in their hand a long rope with a noose in the end. After many unsuccessful attempts, they succeeded in snaring one of the calves by the hind This was a difficult matter to accomplish, for, leg. This was a difficult matter to accompann, 101, besides its own opposition, it was protected by the adroitness of several of the grown females, who crowded round it. So outrageously did the calf struggle, that the big males had frequently to beat him, and I observed that once or twice they lifted him with their trunks literally off his legs." There are two living species of the genus Elephas,—the Indian (Indiaus) and the African (Africanus). The latter is confined to the southern (Africanns). The latter is commed to the southern parts of Africa, and is distinguished from the former by the convexity of its forehead, the enormous size of its ears, and the lozenge-shaped arrangement of the dentine and ivory in its molar teeth. The Indian or Asiatic elephant has the forehead concave, the ears of moderate size, and the dentine and enamel of the teeth arranged in transverse hands. It differs likewise from the African species by the paler brown of the skin, and in having four nails on the hind feet, instead of three; and its tusks are smaller, although in size and weight the Indian elephant exceeds the other. The largest tusk on record is spoken of by Kloknes as having been sold at Amsterdam: its weight was 350 lbs. According to a celebrated elephant-dealer, an animal's "points" should appear as follows:—"Ears large and rounded, not ragged and indented at the margin; eyes dark hazel, and free from specks; roof of the mouth and tongue without dark or black spots of any censiderable size; trunk large; tail long, with a tuft of hair reaching the special on each forcefort, and nearly to the ground; five mils on each fore-foot, and nearly to the ground; are issue on each fore-root, and sand honey being taken in the overnigt. Satrimete were four on each of the hind ones; head well set on, and also offered up, principally consisting of sea-fish and carried rather high; arch or curve of the back rising barley cakes. The fourth day was devoted to a pro-

cession, with a basket containing pomegranates and poppy-seeds. It was carried on a waggon drawn by oxen, which women followed, bearing in their hands mystic cases, while the spectators shouted, "Hail Ceres!" as the procession passed. The fifth day was mystic cases, while the spectators shouted, "Hail Ceres!" as the procession passed. The fifth day was called the Day of the Torches. The initiated went by torchilght on the evening of this day to the temple of Ceres at Eleusis, where they seem to have remained. This custom is supposed to have been symbolical of Ceres wandering in search of her shaughter. The sixth, Iakchos, in honour of Iscohus, the son of Ceres. The statue of Iscohus, adorued with a garland of mystle, and bearing a torch his hand, was carried along the Sacred Road, amid shouts of joy and songs, from the Ceramicus to Eleusis. Great numbers of persons accompanied this procession. On the night between the sixth and seventh procession. On the night between the sixth and seventh days, the initiated remained at Eleusis, and those who were neither mustai (initiated in the lesser mysteries) nor epoptai were sent away by a herald, and the last mysteries were begun. The mustai repeated the oath of secrecy which they had sworn at the lesser mysteries, underwent a new purification, and were led by the mystagogues, in the darkness of night, into the lighted interior of the sanctuary, and were allowed to see what none but the epoptai ever beheld. The later writers none but the epoptal ever pencia. The later writers speak of the rites connected with the oath as being of an awful and horrible character. This probably arose an awill and horrible character. This probably arose from ignorance, as the earlier writers mention nothing of the kind. On the seventh day the initiated returned to Athens with great mirth, and amid great raillery and jests from the spectators, especially at the bridge over the Cephisus. The eighth day was called Epidauria, and was a kind of additional, for these who he some aggident had some teacher. those who, by some accident, had come too late or had been prevented from being initiated on the sixth day. On the ninth day, the principal ceremony consisted in the filling of two earthen vessels with water or wine: the contents of one were then thrown to the east, and those of the other to the west, while the priests who performed the libation uttered mystical Every free-born Athenian was compelled to be initiated into the Elcusinian mysteries. Slaves, prostitutes, and those who had forfeited their citizenship, were excluded. During the time of the celebration of the mysteries, no one taking part in the ceremonies could be arrested, either for debt or for any offence. The chief priest was called the Hierophant, and the second dignitary the Daduchus, or torchbearer. The Eleusinian mysteries survived the independence of Greece for a long time. Attempts were made under the emperor Valentinian to suppress them, but unsuccessfully: they appear to have continued to the time of the elder Theodosius.

ELEVATION, el-e-vai'-shun (Lat. e, and levo, I raise), in the ceremony of the Mass, is the raising, first, of the not, and then of the cup, to receive the homage of the people as the body and blood of Jesus Christ,—the priest himself previously performing the act of adoration by a deep genuflection. At the elevation a bell is rung for the people to look upon the host. This ceremony was introduced into the Latin church in the beginning of the 12th century.

ELEVATION, in Arch., the view or perspective of a building. The term is also applied in architectural drawing to the front view of a building or object drawn

arswing to the front view of a building or object drawn to a scale without regard to perspective.

ELEVATOR el-e-vai'-tor (Lat.), in Anat., is a term applied to various muscles of the body, whose action is to lift up or elevate the parts to which they are attached; as the elevator muscles of the eye, mouth, &c. It is also the name given to an instrument in surgery, employed for raising depressed portions of the bones of the skull.

ELP. (See Fairles)

ELF-ARROWS, elf -ar-roze, a name popularly given in this country to the flint arrow-heads that are occasionally found, and which were at one time used here as weapons of attack, as they still are among various savage tribes. The popular belief was, that they were shot by elves or fairies; and, as they were most commonly met with after showers of rain, they received in Germany the name of thunderbolts. They were regarded as a preservative against witcheraft and poison, and were hance frequently worn about the person.

They are now commonly to be seen in museums of antiquity.

RLGIR MARBLES, el'-jin, a collection of pieces of soulpture, made by Thomas, earl of Elgin, between the years 1802 and 1812, when he filled the office of am-bassador to the Ottoman Porte. The vessel which was conveying the marbles to this country was wrecked near Cerigo: they were, however, recovered from the sea, and ultimately purchased by the British government for the sum of £35,000. They are now to be seen in the British Museum, in what are termed the Eigin rooms. The collection consists chiefly of slabs and fragments from the ruins of the Parthenon, a temple sacred to Minerva, built on the Acropolis of Athens during the time of Pericles, in the 5th century before Christ, and adorned with magnificent friezes and groups of sculpture, executed under the direction of Phidiss.
The sculptures are of three different kinds:—metopes, or rectangular slabs that covered the spaces between the triglyphs of the Doric frieze of the peristyle on the southern side of the building; parts of the frieze that surrounded the exterior of the entire temple, at a height of 40 feet from the ground, forming a continu-ous series of sculpture about 520 feet in length and 40 inches in height; and portions of statues that adorned the pediment, which are unfortunately con-siderably mutilated, being for the most part without heads, arms, or feet. The metopes are executed in high relief, and represent the battles of the Centaurs and Lapithæ: the slabs are sixteen in number, one, how-ever, being a cast in plaster from the original piece, or rectangular slabs that covered the spaces between ever, being a cast in plaster from the original piece, which is now in the Louvre at Paris. The frieze is in low relief, and represents the procession that took place at Athens once in five years, called the Pana-thenæa. There are about 325 feet of this frieze at the British Museum, 250 feet being portions of the original marbles, and the remainder consisting of plaster casts. Of the statues, the best are the group known as the Fates, the statue of Theseus, the torse of Ilissus, and the spirited head of one of the horses of Night. There the spirited ness of one of the norses of right, are the remains of great beauty in the collection; among which may be mentioned the statue from the monument of Thrasyllus, the Carystid from the Pandrosion, and the column from the Erechtheum, with some urns and sepulchral inscriptions.-Ref. English

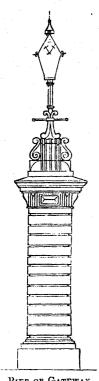
some urns and sepulchrai inscriptions.—Ref. English Cyclopadia—Arts and Sciences.

ELISION, e-lizh'un (Lat. elizio, from elido, I strike off), in Gram., is the cutting off or suppressing a vowel or syllable, particularly at the end of a word, for the sake of cuphony, or in poetry to suit the verse. Elision occurs chiefly in the ancient languages of Greece and Rome.

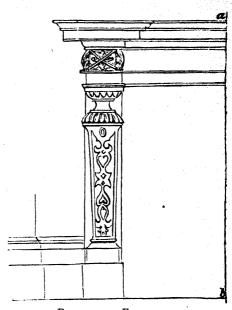
ELIXIR, e-liks'-er (Lat. elixo, I extract by boiling), is a name given to various medical preparations, consisting of wine, or spirits of wine, and various aromatic and bitter vegetable substances. The word has now almost gone out of use, and its place is supplied by tincture. Strictly speaking, however, clixirs differ from tinctures in being thicker and more opaque, and containing less spirit.

CONTAINING ICES SPIPIL.

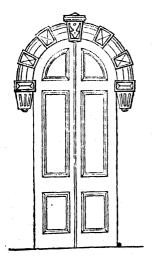
ELIZABETHAN ARCHITECTURR, e-liz-ü-be'-thun, the style that prevailed in England during the latter part of the 16th century and the early part of the 17th, and so called because it is the characteristic style of buildings erected during the reign of Elizabeth. It was used only for palaces, mansions, and dwelling-houses, being unsuited for ecclesiastical architecture; but, for the purposes to which it was applied, it was stately and picturesque as far as the exterior is con-cerned, and afforded the means of obtaining a commodious and comfortable interior. It is somewhat similar to the Renaissance style of architecture in France, and is sometimes said to consist of a combination of this is sometimes said to consist of a combination of this with the Tudor style that prevailed in the reigns of Henry VII. and Henry VIII. The finest old country mansions and palatial residences in England are in this style, and among the best may be mentioned those of Longleat; Holland House, Kensington; Burleigh; Wollaton House, Notts; and Aston House, wear Birmingham, which has lately been purchased and converted into a museum. The most common form of the ground-plan of houses in this style is that of of the ground-plan of houses in this style is that of the letter B, and it is supposed that it was adopted as a compliment to Queen Elizabeth, as it was the initial letter of her name: it is most probable, how-



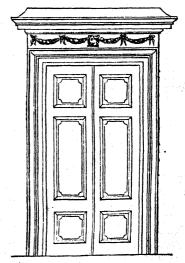
PIER OF GATEWAY.



ELIZABETHAN FIRE-PLACE,



ELIZABETHAN DOORWAY.



ELIZABETHAN DOORWAY.

ever, that the plan was chosen on account of the convenience it offers for the peculiar structure of the venience it offers for the peculiar structure of the exterior and the interior arrangements, and that the compliment was an after-thought. The main part of the mansion is represented by the back of the letter, while the wings at the sides and the porch in the centre are denoted by the three parallel lines projecting from it at right angles. The material most company that the declaration is the contract of the c ing from it at right angles. The material most com-monly used was brick of a bright red colour; the quoins and dressings of the windows were occasionally of freestone; the face of the exterior was also frequently ornamented by dark bricks disposed so as to form a diamond-pattern, in diagonal lines cutting each other at right angles. When stone was used, it was generally covered with stucco, and the exterior was painted. The larger buildings were reared on a solid basement, and the entrance was gained by flights of steps leading to a terrace with a balustrade in front. The windows were square-headed, generally broader than they are high, and divided into compartments by mullions and The different floors were divided on the transoms. exterior by broad string-courses running along the en-tire front of the building, and elaborately ornamented with arabesque scroll-work, consisting of curved and angular bands, and bosses combined in patterns of endless variety. The spaces between the windows were adorned with pilasters on pedestals, which were panelled and ornamented with scroll-work. The pilasters were always surmounted by a continuous entablature, and the space between the entablature of one set and the base of the one above it is occupied by the ornamented band or string-course already mentioned. The gables were various in form, the ogee gable being the most common: the greater part of them are adorned with arabesque scrolls and mouldings. The chimney-shafts were tall, and generally circular, octagonal, or twisted in shape; sometimes they were banded with interlaced fretwork. The broad and stately staircase of polished oak is one of the most striking features of the interior, the balustrades and massive uprights at the angles being richly carved. The ceilings were divided into compartments by rectangular and curved mouldings. The walls were panelled with wainscot, which had the effect of rendering the rooms dark, and to a certain extent gloomy. The chimney-pieces were claborately adorned, and were lofty and massive. were ensurance, and were only and massive. One of the most characteristic examples of Elizabethan architecture is that afforded by Wollaton House, in Nottinghamshire. To gain a suitable and comprehensive idea of the picturesque beauty of mansions in this style, both externally and internally, we have only to turn to some of the charming drawings of Louis

to turn to some of the charming drawings of Louis Haghe and the coloured illustrations included in Knight's Old England. At fig. 2, Plate XLVIII., is shown an example of a window (with plan) in the Elizabethan style; and upon the preceding page are given other examples of the same style.

RLK, or MOOSE DEER, elk (Sax. elch), (Alces Malchis), the largest of all the deer tribe, and common to the northern parts of both hemispheres. The antlers of this animal are comparatively short, but broadly dilated, and terminated by a numerous series of long points. When fully grown, these organs weigh from fifty to sixty pounds. The moose does not reach its full development till its fourteenth year, and then may full development till its fourteenth year, and then may be met measuring six or even seven feet at the shoul ders. Its legs are very long; its neck thick and short; its head elongated, and terminated by a broad The coat of the moose is composed of long bristly hair, of a light ash-colour, and of a dark russet-brown on the surface. In the winter the coat of the bull moose changes to a glossy black. From behind the ears down the neck and part of the back extends a mane, barah and thick, and nearly a foot in length. The hair on the belly and inside the legs is sandy colour. Pendent from the spot where the junction of the head and neck occurs is a baggy pouch covered with long black hair, and known as the "bell." The food of the moose consists during the summer months of such leaves and tender branches as abound in its native forests. In the winter season it subsists on the tops of young shoots, pulling them into its mouth by its grehensile upper lip (or mouffle), and biting them off. When pressed by hunger, however, it will eat any green thing it meets, except the foliage of the apruce-

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tree; that, according to recent observations, it never touches. It readily eats grass, which, unless rising very tall, or growing on a bank, it cannot, from its stiff very tall, or growing on a bank, it cannot, from its stiff and short neck, orop without straddling awkwardly. Its flesh is highly esteemed as an article of food, especially when smoked or dried bacon-fashion. The "mouffle" is the most choice bit, and is said to be, when boiled, rich and gelatinous, and to resemble the renowned green fat of the turtle. "As the flesh of the elk is palatable, and the horns and skin extremely useful, the animal is much persecuted by hunters. It is a swift and enduring animal although the geit is is a swift and enduring animal, although its gait is clumsy and awkward in the extreme. The only pace of the elk is a long swinging trot; but its legs are so long and its paces so considerable, that its speed is much greater than it appears to be. Obstacles that are almost impassable to a horse are passed over easily by the elk, which has been known to trot uninterruptedly over a number of fallen tree-trunks, some of them five feet in oircumference. When the ground is hard, and will bear the weight of so large an animal, the hunters are led a very long and severe chase before they come up with their prey; but when the snow lies soft and thick on the ground, the creature soon succumbs to its lighter antagonists, who invest themselves in snow-shoes, and soud over the soft snow with a speed that shoes, and soud over the soft enow with a speed that speedily overcomes that of the poor elk, which sinks floundering into the deep snow-drifts at every step, and is soon worn out by its useless efforts."—(Wood's Natural History.) The most successful way of hunting the moose is by "calling;" that is, imitating the trumpeting noise made by the female at the pairing season to attract the bull. Something like "quoh quorh" is the sound, and, by means of a tube of birch lark the skilful huntary is any light to simulate it executive. bark, the skilful hunter is enabled to simulate it exactly. Shy as the gazelle at other times, the bull moose swiftly obeys the invitation, and is thus brought within range of the rifle of the hunter, who is concealed in the thicket.

ELL, et (Ang.-Sax.), a measure of length in various countries, used principally for cloth, linen, silks, and similar fabrics. Formerly it was much used in England; but it is now almost entirely superseded by the imperial yard. An English oll is 45 inches, or 5 quarters; a Flemish ell is 27 inches, or 3 quarters; the French ell is 6 quarters, and the Scotch ell 37 25 Eng-

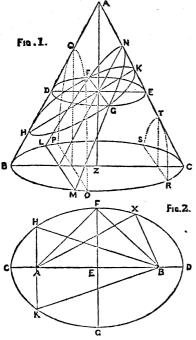
ELLAGIC ACID, el-lai'-jik, an insoluble acid found as a grey crystalline powder during the preparation of gallic acid from gall-nuts. It also occurs, curiously enough, in the intestinal concretions called bezoar-stones, found in the stomachs of the wild goats, antelopes, and deer of central Asia. M. Braconnot, who made a particular study of the substance in 1818, gave it the name of ellagic acid, which he formed by reversing

the word galle (Fr., gall).

ELLIPSE, el-lips' (ir. elleipsis), an oval curve, one of the comic sections. (See Contr. Sections.) The sections of a cone formed by a plane pussing through it et right angles to its axis is a circle. If the plane cuts the cone in a direction parallel to its surface, the conic section so formed is a parabola; but any section formed by the passage of a plane through the cone at formed by the passage of a plane through the cone at any angle to its axis between a right angle and the angle at which the surface of the cone is inclined to the base, is an ellipse. To make this clear, let the figure A B C represent a cone (see Cons); any section of this cone at right angles to the axis A Z, or parallel to the base, as the section D F E G, will be seen at once to be a circle. Let the plane passing through the cone in the section D F E G be now supposed to revolve shout F G, a diameter of the circle D F E G, as about an axis, any section of the cone, as H F K G, made in its revolution from its original position when it was at right angles to the axis, until it assumes a position L F N G M, parallel to the surface of the cone, as an ellipse. The section of the cone formed by the position LFNG M, parallel to the surface of the cone, as an ellipse. The section of the cone formed by the last-named position of the plane is a parabola. When the outting-plane is in a direction parallel to the axis, as OQP or RTS, the curve thus formed is an hyperbola. In fig. 2, CFDG represents a perfect ellipse, The points A and B are called its fooi. CD its greater axis, and FG its lesser axis. C is its centre, and the fraction represented by EB as the numerator, and ED as the denominator, its eccentricity. The lines drawn from any point in the circumserence to the foci are

### Ellipsia

termed the focal distances of that point, and the sum of these is the same for every point in the circum-ference, since the curve is generated by the revolution of a point controlled by a cord, equal in length to the



THE ELLIPSE.

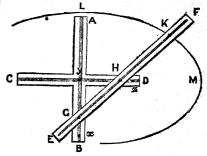
greater axis CD, and fastened at the ends to the foci AB; thus, AC+CB=AH+HB=AF+FB=AX+XB, &c. The line drawn through either of the foci parallel to the lesser axis, as H K, is called the latus rectum of the ellipse.

ELLIPSIS, el-lip'-sis (Gr. elleipsis, an omiconom), and Gram, and Rhet., is the omission of one or more words which may be easily supplied by the imagination. It is used either to express passion or for the sake of brevity and conciseness.

RULIFFIC COMPASS, el·lip'-tik, the name applied to any contrivance used for describing an ellipse. The most common and simple method is to take a string, equal in length to the major axis of the ellipse (see ELLIPSE), and attach the ends to two pins, which are stuck into the material on which the ellipse is to be stuck into the material on which the ellipse is to be described, at those points in the major axis which represent the foci of the ellipse. The string must be then extended on the point of a pencil, and the curve traced by the point, the string being kept at full stretch, will be an ellipse. Another plau is to take two pieces of wood or metal, which may be fired at right angles to each other: a deep groove is cut in the upper surface of each in which two pins travel which are angles to each other: a deep groove is cut in the upper surface of each, in which two pins travel, which are attached to a beam, with a hole or socket at one end of it for the reception of a pencil. The pins may be fixed at any distance from each other on the beam, by means of clamping screws, so that ellipses of various sizes may be described, as large as the length of the beam will allow. The operation may be understood from the accompanying figure. A B C D are the grooved pieces at right angles to each other, EF the beam, GH the pins, K the pancil point. Now, in describing the curve LM, a quarter of the ellipse, when the pencil is at L the beam is exactly on the top of A B, lying along its surface and in the same direc-

## Elysium

tion with it; the pins are at  $\varphi$  and y. As the pencil traces out the curved line, the pin at x moves along the groove into the position y, while that which was at y moves to z; so that, when a fourth of the ellipse has



ELLIPTIC COMPASS.

been described, the beam is exactly on top of C D, and in that direction. The pine travel up and down the grooves from either end to the centre, and from the centre to either end, until the entire curve has been traced out.

ELM. (See ULMUS.)
ELMO'S FIRE, SAINT, el'-moze, a luminous appearance or flery meteor frequently seen playing about the masts and rigging of vessels at sea, during dark stormy nights. The phenomenon is due to atmospheric electricity.

tricity.

ELOCUTION, el-o-kw'-skun (Lat. e, and loquor, I spenk), is delivery, or the art of effective speaking. (See Delivery, Orazony.)

ELOGE, ai-lozhe' (Fr.; Lat. elogiv., Gr. eulogia), denotes, literally, praise, and is more particularly splied to orations delivered in bonour of a deceased person. When a member of the French Academy dies it is the queton for bis successor to deliver dies, it is the custom for his successor to deliver a panegrical oration, setting forth his labours and merits. These cloges are generally printed and published, and some of them form cloquent and valuable contributions to literature.

ELONGATION, e-lon-gui'-shun (from low Lat. elongo, I lengthen).—In Astron., this name is sometimes applied to the angular distance between the sun and any other heavenly body, viewed from the earth's surface. not used to express the distance between any two stars.

ELOPEMENT, e-lope'-ment (Du., from loopen, to run), in Law, is where a married woman of her own accord leaves her husband and goes to live with an adulterer. By the Statute of Westminster the Second, if a woman voluntarily leaves her husband and lives with an adulterer, she shall lose her dower, unless her hus-band be voluntarily reconciled to her.

ELUTRIATION, e-lu-tre-ai'-shu o-lu-tre-ai'-shun (Lat. elutrio, cleanse), in Chem., a process employed for separating substances reduced to powder, when of different specific gravities, by means of water. It is much employed in separating metals from their ores. Gold-

employed in separating metals from their ores. Goldwashing is a rough elutriation.

ELYES. (See FAIRIES.)

ELYESUM, or ELYELA FIRLDS, e-lizh'-e-um (Gr. elusion), in Myth., a place or island in the infernal regions where the souls of the virtuous were supposed to dwell after death. There happiness was perfect, and the pleasures innocent and refined. The air was wholesome, serene, and temperate. The employment of the some, serene, and temperate. The employment of the spirits of heroes differs according to different poets. Homer, in the "Odyssey," describes such a region as that mentioned above, while in the "Iliad" Achilles in Elysium is depicted as in a sombre place, envying the meanest person on earth. Nearly all the later classical poets describe Elysium as a place of light and happiness, some adding continual feasing and revelry, others in warlike sports, and others in taming horses and hystics. and hunting. The position of the Elysian fields differe also according to vasious poets. By some it is said to be in mid-air, others in the sun, others in the moon,

and others in the centre of the earth, near Tartarus: the general belief was that they lay in one of the isles of the ocean, called the Fortunate Islands, now called the Canary Islands.

EZZEVIE EDITIONS, el'-ze-ver.—The Elzevirs were a family of celebrated printers and publishers at Amsterdam, Leyden, the Hague, and Utrecht, who flourished mostly in the early half of the 17th century, and who gave to the world many beautiful editions of the best authors of antiquity. The Elzevir editions have been long and deservedly esteemed for the clearness, delicacy, and perfect equality of the characters, for their close position together on a solid and very white paper, and the excellence of the press-work. Their Virgil, Terence, and Greek New Testament, are regarded as their masterpieces. The Elzevirs published several catalogues of their editions, and a list of them is given by Mr. Horne in his "Introduction to the Study of Bibliography;" but the best account of

ished several catalogues of their editions, and a list of them is given by Mr. Horne in his "Introduction to the Study of Bibliography;" but the best account of them is to be found in the fifth volume of Brunet's "Manuel du Libraire." pp. 799—827.

EMANATION, em-à-nai-shun (Lat. emanare, to emanate, issue, or flow out), in the ancient systems of philosophy, is applied to that doctrine which regards all created things as emanations from the Supreme Being. In this view there was no spontaneous creation; but all things issued necessarily out of the Divine fulness. This doctrine came from the East, and exerted a powerful induence on the systems of ancient Greece, particularly the Pythagorean. Traces of it are also to be found in the Hindoo mythology of the present day. In theology, the doctrine of emanation has been employed to explain the relationship among the persons of the Trinity, the Son and Holy Ghost being regarded as

effluxes or emanations from the Father.

EMANCIPATION. (See SLAVERY.)
EMANCIPATION, ROMAN CATHOLIC. (See ROMAN
CATHOLIC EMANCIPATION.)

EMBLEMING, embau\*-ing (from Fr. embaumer), is the art of preserving the body after death, from decay, by means of aromatics, antisoptics, or desiccation. The embalming of the dead was practised by the ancient Egyptians from the earliest times, and was associated with their religious belief, for they held that the soul, after completing its cycle of separate existence of several thousand years, again returned to the body, and if found decayed or wasted, it transmigrated. The invention of the art was ascribed to Anubis, the son of Osizis, who first performed this office to his father; and hence all deceased persons were supposed to be embalmed after the model of Osiris. Herodotus and Diodorus have left us accounts of the process of embalming in their time; but these differ in several respects from the appearance of the mummies of the present day. The body was first delivered to the undertakers, called by the Greeks paraxhists or "flank-incisors," a low and polluted class of persons, who resided in the cemeteries or suburbs. A scribe first marked with a reed pen on the left side below the ribs a line, along which the paraschistes made a deep incision with a rude knife of stone or flint, on which he was immediately pursued with stones and imprecations by the bystanders, as if he had committed some beinous offence. The taricheutes, or preparer, then proceeded to remove the entrails and lungs, with the exception of the heart and kidneys. The brains were drawn out through the nostrils by a crooked iron instrument. The entrails were washed with wine of palms and perfumed, and the cavities were then filled up with myrrh, cassis, and other aromatic drugs. The flank incision was then sewed up, and the body steeped in an upright position either in a sepulcher or in one of their own spartments, for many of them kept their dead at home, esteeming it a great comfort to have the bodies of their relatives beside them; and some times they were produced at festive entertainments. This was the most expensive mode of embalming, and

seventy days: after which the viscers came sway, and nothing remained but the skin and bones. The third method, used only for the lower classes, was performed by washing the body with myrrh and laying it in salt for sevency days. All classes among the Egyptians were embalmed, even the malefactors; and we read in Scripture that the body of the patriarch Jacob was practised by the ancient Egyptians, is attested by the numerous mummies that are to be seen in the present day in all the great museums of Europe. (See Mumarx.) Various other nations of antiquity adopted certain means for the preservation of the human body. The Persians employed wax, the Assyrians honey; the Jews embalmed some of their kings with spices, with which the body of our Lord was also anointed, and Alexander the Great was embalmed with wax and honey. The only people, however, who adopted an elaborate process like the ancient Egyptians are the Guanches, or ancient inhabitants of the Canary Isles.

EMBANEMENT, em-l-dink'-ment, a term used in engineering, both civil and military: in the former it is applied to a mound of earth broad at the base and narrow at the top, thrown up to form a roadway or canal at a level above that of the ground, or to protest ground that lies low from being inundated by the sea ar any river. In Mill, it is generally applied to the mass of earth thrown up against the revertments of a rampart or any scarped work, or which is raised in the form of a bank to furnish any earthwork for defensive purposes. It should be the especial care of the engineer to see that his embankments are constructed on ground which affords a firm and unyielding basis, or, if the ground below he loose and compressible, a proper foundation must be secured by driving piles, or by making pits in the soft ground, which must be filled with stones and other materials that do not readily yield to pressure. A good foundation secures the work from displacement by vertical compression, and care must be taken to avoid lateral dis-placement by cutting deep trenches at the foot of the slopes to carry off any excess of moisture. The slope of the embankment must also be regulated by the nature of the soil used in its construction, to prevent masses of earth from slipping away from the sides, which will happen, particularly after a heavy fall of rain which has continued for some time, if the sides be too steep. For chalk, gravel, rubble, and loamy soil, the base of the slope should be to the height as 14 to 1; for sand and ordinary clay soils it should be as 2 to 1; and for mari and greasy soils as much as 3 to 1. The nature of embankments best suited to 3 to 1. The nature of embankments been suited to resist water, and the method of constructing them, will be found elsewhere, as well as the formation of those constructed for the sides of canals. (See Canal, Sea Dugmences, River Defuncts) Embankment for roads and railroads are formed by depositing the material obtained from excavations and cuttings in successive layers : allowance should always be made for compression and settlement, particularly in works that are rapidly constructed, by raising the top of the bank above the level at which it will be when the materials of which it is composed have settled together into a solid mass. In forming a bridge or drain, over which an embankment is to be constructed, the masonry should be strong, and the outer surface of the walls and top of the arch covered with concrete to prevent the water from filtering through and destroying the morter. Hydraulic lime should be used in building them. The principal embankments in Eng-land are those in the Fen countries in Cambridgeshire and Lincolnshire, and those constructed to carry parts of many lines of rail, some of which are of great magnitude.

EMBANKMENT, THAMES. (See THAMES EMBANG-MENT.)

dead at home, esteeming it is great comfort to have the bodies of their relatives beside them; and sometimes they were produced at feative entertainments. This was the most expensive mode of embalming, and was adopted only by the wealthiest classes, costing a rate of various kinds. On the breaking out of a war, talent of silver (or about £234). Another and cheaper with may be declared prizes. When it is necessary to conceal any incision, by injecting the viscera with all of cedar, and then steeping the body in natron for

#### Embassy

may be laid upon all vessels, native and foreign, that may be the means of conveying information; and an embargo may also be laid by government upon ships belonging to its subjects in order to employ them in

belonging to its subjects in order to employ them in the service of the country.

EMBASSY, em'-bds-ve (Fr. ambassade), a term applied in general language to a diplomatic mission. In a more restricted sense, however, an embassy is a mission presided over by an ambassador, and is distinguished from an ordinary legation or mission which a intrusted to an envoy or other subordinate authority. The true difference between an ambassador and an envoy is that the former represents the person of an envoy is that the former represents the person of his sovereign, and in that capacity is able to demand a private audience of the monarch to whom he is a private audience of the accredited. An envoy, on the contrary, is obliged to make his proposal to the minister of foreign affairs. Every ambassador is provided with a residence, and cavoys and subordinate ministers receive an allowance There are now five embassies, profor house-rent. perly so called; namely, those at Paris, St. Petersburg, Constantinople, Vienna, and Berlin. (See AMBASSA-

EMPATTLED, em-bül'-tid, in Her., one of the eight crooked or curved lines used, in addition to the straight line, in dividing one part of the field from another, or

line, in dividing one part of the field from another, or for the outline of any principal ordinary. When this outline, or line of division, is in the form of the buttlements of a tower, it is said to be embattled. French heralds use the term crenelle. (See Chenel.)

EMBEDAYS, em'-ber, are certain days of the year set apart by the Church for prayer and fasting, the weeks in which they occur being termed Ember-weeks. The derivation of the term is doubtful. According to some, it is derived from the Greek hemerai, days; according to others, from the Saxon ymbren, a circle or revolution. The Ember-days are the Wednesday, Friday, and Saturday after the first Sunday in Lent, after the feast of Pentecost, after the 14th of Septemafter the feast of Pentecost, after the 14th of September, and after the 13th of December. They were first appointed to be observed by Pope Calixtus in the 3rd century, for imploring the blessing of God on the fruits of the earth, and also for the grace of the Holy Ghost upon the ministers ordained at these times. The Sundays immediately following these seasons are still appointed by the canons of the Church of England for the ordination of priests and deacons.

EMBEZIEMENT, en-lest z-In-most (Nor. embeasiler, to fileh), the fraudulent appropriation by clerks, servants, or others, of money or goods intrusted to their ware, or received by them on account of their employers. This is not an offence at common law, and hence offenders were suffered to escape, until it was made a felony by 39 Geo. III. c. 85. By 7 & 8 Geo. IV This is not an offence at common law, and c. 29, embezzlement is declared to be larceny, and punishable with transportation or imprisonment. By the Criminal Justice Act (14 & 15 Vict. c. 100) it is further made competent to convict for embezzleis further made competent to convict for embezzle-ment persons indicted for larceny, and vice versa. Persons employed in the public service embezzling money or valuable securities are deemed guilty of felony, and liable to penal servitude or imprisonment. For embezzling, stealing, or destroying her majesty's military stores to the value of twenty shillings, the offender is liable to penal servitude or imprisonment; under twenty shillings, to fine corrected punishment or under twenty shillings, to fine, corporal punishment, or imprisonment. By the Fraudulent Trustees Act (20 & 21 Vict. c. 54), provision is made for the punishment of fraudulent misappropriations by bankers, brokers, factors, and other agents, of moneys or property in-trusted to them.

Trusted to thom.

EMBLEM, em-l-lem (Gr. emblema, from en, into, and ballein, to cast), in the primary sense of the word, it means a piece of mosaic, or any work in which bits of one kind of material are inserted or let into another; but, in our acceptation of the term, it is applied to anything which, by association of ideas, appears to be a visible and suitable representation of some abstract quality, or it has a similar meaning to that of the word device. (See Davion.) Thus the lamb is the emblem of meakness, humility, and docility; the lion, of courage and magnanimity; thedog, of fidelity; and the fox, of oraft and cunning. The eagle is the emblem of imperial power, as it is reputed to be the king of birds, and often styled the royal bird. Other things have been

### **Embrecation**

taken as emblems of persons as they are associated with them by historical recollections: thus the gridiron is the emblem of St. Lawrence, as the instrument of his martyrdom; the wheel, that of St. Catherine, for a similar reason. An angel bearing a pen is the emblem of St. Matthew; a lion, that of St. Mark; a bull, of St. Luke; and an eagle, of St. John. Flowers are supposed to be emblematic of various qualities, and are, in consecuence. sometimes used in the East as a means in consequence, sometimes used in the East as a means of communication.

of communication.

EMBOSSING, em-bos'-sing (Fr. embosser, from bosse, a stud), the art of obtaining patterns of any kind, or inscriptions, in relief, on cloth, leather, felt, metal, pasteboard, or paper. It is effected by subjecting the material on which it is desired to raise any pattern to very great pressure, which may be applied vertically by the sharp blow of a die, or by a cylinder. For embossing crests, addresses, &c., on paper and envelopes, a small stamping-machine is used, and the device desired is cut in intaglio on the die. The paper is placed on a piece of soft metal stamped by the die, and therefore having the device in relief, and the impression is obtained by pressing the die forcibly on it by means of a lever. pressing the die forcibly on it by means of a lever. For embossing woollen goods, the cylinders which are used must have the pattern cut on them in intaglio, but for velvets, and embossing paper of any size, the patterns must be in relief. The following is the process adopted when cylinders are used. The engraved cylinders are used. der, or embossing roller, and another of the same diameter, called the bed-roller, are set closely together, and the material is passed between them. The bedroller is made of paper (see CALENDERING), and covered with felt, to prevent it from receiving and retaining any impression from the embossing-roller. The cylinder on which the pattern is cut is made hollow, to receive heated irons, or to be heated by steam. Leather may be embossed by pressure, or by rendering it supple by moisture, and then fashioning it into the desired shape on a mould cut for the purpose. Ornaments for picture-frames and the interior decoratriaments for picture-frames and the interior decora-tion of apartments, which closely resemble carved oak, may be made in this manner. The cloth which is used for binding books is embossed by passing the material between two steel rollers engraved with the required pattern, which are heated by gas jets from pipes pass-ing through the centre of the rollers, which are hollow. When there is any peculiar device on the cover of a book bound in cloth, and there is much gilding about a book bound in cloth, and there is much guding about it, the cloth is first glued to the millboard covers, and subjected to great pressure from the die engraved for the purpose, after it has been laid on an iron piste, which is heated from beneath by gas.

Embrasure, em-brai-zhur (Fr.), in Arch. this term

is applied to the rectangular indentations of a bat-

tlement, or the splayed opening for a door or window.

EMBRASURE, in Mil., the opening made in the parapet of a rampart to allow a cannon to be fired through it. The neck or opening of an embrasure should be as The neck or opening of an embrasure should be as small as possible in front, or at the exterior face of the parapet, to protect the artillerymen who are working the guns from the sharpshooters of the enemy. The breadth of the opening varies from shout 2 feet for 18-pounders to 3 feet 3 inches for 68-pounders and Lancaster guns. That part of the parapet which fills up the embrasure below the opening, and protects the gun-carriage, the muzzle of the gun appearing above it, is called the genouillere. The top of the genouillere forms the sill of the embrasure, and generally slopes forms the sill of the embrasure, and generally slopes forms the sill of the embrasure, and generally slopes outwards. The distance between the sill and the crest of the parapet should be about 4 feet, while the height of the genouillère varies from 2½ feet for guns on solid on travelling standing carriages to 34 feet for guns The cheeks splay outwards from the neck towards the rear or inner face of the parapet, and are inclined to the central line of fire or capital of the embrasure at an angle of eight or ten degrees. In fieldworks, embrasures are revetted with timber and fascines or gabions, and are protected from the flame from the muzzle of the gun by a covering of raw hides. Mantlets or shutters are often used to mask embrasures, and protect the men at the guns from riflemen. They are withdrawn suddenly when the gun is to be discharged, and closed after the fire is given.

Embrocation, embro-kai', shun (Gr. embroche, a moistening), a term originally applied to those exter-

## Embroidery

nal applications used for softening or dissipating nal applications used for softening or dissipating swellings. The word has, however, extended beyond its primary meaning, and is applied to cleaginous and spirituous compounds which incite the surface of the skin to increased action, and produce all the effects of counter irritants, or which, by their influence on the extremities of the nerves, assist in resolving spaem; thus acting as antispaemodics.

EMBROIDERY, em-broid'-er-e (Fr. broderie), a term applied to the art of working ornamental figures upon fabrics of any kind with a needle and thread. The art of embroidery is one of the oldest, and has always been one of the most important domestic occupations among oriental nations. It was practised among the Hebrews during the time of Moses; and the women of Sidon were famous for their embroidery before the siege of Troy. In after-years, the women of Greece were celebrated for their proficiency in the same art; and some of their productions are said to have equalled, if not surpassed, many of the finest naintings then existing. The inhabitants of Peru, paintings then existing. The inhabitants of Peru, when discovered by the Spaniards, were found to have in their possession elaborate embroideries of gold and silver on feathers, which they manufactured with great skill. The ecclesiastical tapestry, curtains, priests vestments, &c., in the middle ages, were all embroidered with the needle; and screens, corridor linings, &c., were the daily handwork of some of the noblest ladies, assisted by their hand-maidens. In the present day, all embroidery may be divided into two classes,— embroidery on stuffs and on muslin. The first class includes all ornamental needle-work upon articles of includes all ornamental needle-work upon articles of furniture, standards, church vestments, &c.; the second is employed usually upon articles of female apparel, such us caps, collars, &c. Stuff embroidery is performed by means of a loom, and is executed with gold, silver, silk, cotton, and woollen threads. Muslin embroidery is generally accomplished by hand, the fabric worked upon being stretched on a frame. This kind of work has been very fashionable of late years; but although at first only looked upon as an elegant accomplishment practised by ladies, it now elegant accomplishment practised by ladies, it now forms an article of considerable traffic, and gives employment to a large number of persons. Berlin-woolwork is a sort of embroidery which has been in vogue
for many years among ladies. The fabric worked upon is generally stretched upon a frame, and the design to be embroidered is drawn upon it, or some other contrivance is employed by the worker. other contrivance is employed by the worker. An engraving, in which lines are drawn corresponding with the threads of the fabric, is generally used. The name is derived from the fact that a printseller named Wittich, in Berlin, up to 1810, sold the best patterns for this kind of work. Machine embroidery has given a great impetus to the art, and about eight years ago a machine was invented by M. Heilmann, of Mulhausen, by which one person could guide 80 to 140 needles, all working at the same time. This machine was exhibited in the French Industrial Exhibition of 1854, and was afterwards natested in England. All 1854, and was afterwards patented in England. All the English rights were afterwards purchased by Mr. H. Houldsworth, the eminent silk manufacturer of Manchester, who greatly improved the machine.

Emberge, em'-bre-o (Gr. embruon, from embruo, I bud forth), is the rudimentary state of any organized body. In Physiol. it is applied to the foctus in utero before the fifth month of pregnancy, from its growth resembling the budding of a plant. Hence we have embryology, a description of the embryo; embryotomy, or the extraction of the embryo piecemeal in delivery.

EMBEYO, in Bot., the rudimentary plant existing in EMBEYO, in Bot., the rudimentary plant existing in the seed. The presence of a true embryo is the essential characteristic of the seed of flowering plants; for a spore, as the reproductive body of a flowerious plant is called, has no true embryo, the rudimentary plant being only developed from it after its separation from the parent. Three parts, corresponding to the root, stem, and leaves of the perfect plant, are distinguished in the embryo, and are termed, respectively, the rudicle, the planuale, and the cotyledons. These parts may be readily recognized in many seeds, especially when the process of germination is a little advanced. Plants which have seeds with two cotyledons are said to be which have seeds with two cotyledons are said to be dicotyledonous, and those which have seeds that commonly possess but one cotyledon are said to be mone-

cotyledonous. The spores of flowerless plants having no true embryos, can have no cotyledons; hence such plants are said to be acotyledonous. When albumen is present in a seed, the size of the embryo is in inverse proportion to it: thus in grasses there is a large deposit of albumen, but a very small embryo; while in the nettle the embryo is large and the albumen small. When the embryo is external to the albumen and in contact with the integuments, as in grasses, it is described as external; when it is surrounded by the albumen on all sides, except at its radicular extremity, as in the paney, it is said to be internal.

EMBRALD, em-er-dld (Fr. émerande), in Min., one of the precious stones, of a rich deep green colour, occurring in hexagonal prisms in granite, gueiss, and mica rocks. The finest emeralds, however are found in dolomite in Granada. The duke proportion to it: thus in grasses there is a large de-

ever, are found in dolomite in Granada. The duke of Devonshire possesses an emerald from this lo-cality measuring two inches in length by one in diameter. Fine specimens also occur in Peru, and inferior ones in Bavaria, India, and Siberia. Some specimens from the latter country measure 4; inches in breadth and 12 in length; but they are worthless as gems, being full of strice, and not transparent. Chemically, the emerald consists of 65 silica, 14 alumina, 13 glucius, 2.56 lime, and 3.50 oxide of chromium. distinguished from beryl by its more brilliant colour, being coloured with oxide of iron instead of oxide of chromium.

EMERALD, ORIENTAL, in Min., a green variety of

sapphire. (See SAPPHIRE)

EMBERSION, e-mer'-shuu (Lat. e, from, and mergere, to plunge), in Astron., the term applied to the reappearance of a heavenly body from behind another, after the former has been hidden from view by the passage of the latter across its disc, as in an eclipse.

EMERY, em'-e-re (from Cape Emeri, in the island of EMERY, em: e-re (from Cape Ellier), in the island of Naxos), in Min., b variety of corundum, consisting mainly of alumins, combined with a small quantity of silica, peroxide of iron, and a little water. Dr. Lawrence Smith states that those varieties containing rence Smith states that those varieties containing least water are, exterie paribus, the hardest. Emery occurs in Spain, Asia Minor, in the Greek islands, and in the island whence it takes its name. Ground to powder of different degrees of fluences, it is much used in the arts as a polishing powder. It is mostly employed attached to choth or paper. Emptres, e-met-like (Gr. emetike), a term applied to those medicines which influence the stomach in a permitir renewal and of the production and produce.

culiar manner, so as to invert its action and produce vomiting. This effect is caused not by the quantity of the matter introduced, but by the nature of the emeticitself. Emetics are administered in many cases of illness. They are useful when it is found necessary to relieve the stomach of some hurtful or indigestible substance. Lives that have been endangered either substance. Invest that have been endaughered either by poisons or excess of food have frequently been saved by means of emetics. In cases of fever, emetics are used: it is supposed that the copious secretion which they produce from the glands of the stomach and intestines has a direct curative action. In all cases of fever, emetics should be administered at as early a stage of the disease as possible. They invariably render the disease milder, and may be advantageously repeated even at a more advanced stage, as tageously repeated even at a more advanced stage, see they induce sleep and a moist state of the skin. They are specially efficacious in epidemic, typhus, common fever, and enanthematous fevers, especially measles, scarlet fever, and small-pox. According to the opinion of Dr. James Clark and Dr. Carswell, emetics are able in the stage of the property of the control of the contro to dislodge tubercular matter from the lungs in the to dislodge tubercular matter from the lungs in the earlier stages of consumption. Emetics, however, should always be given with great caution, since, in cases of depression of the system, their action is to produce nausea, by which the vital power is always diminished. The emetics generally used consist of preparations of antimony, zinc, and copper. Squills, lobelis, ipecacuanha, and other substances, are also employed. Mustard and water diluted is one of the mildest and most generally used emetics. Emetics should never be administered to a patient who is disposed to apoplexy, or a tendency of blood to the head, or where the patient is liable to hemorrhage from any organ, or is subject to hernia. During pregnancy, also, emetics must be avoided.

Entigration, eme-grai-shun (Lat. e, and migrare, to remove to another place to dwell in), is the movement of one or a number of persons out of one place or country with a view to their settling in another, into which they are said to immigrate (Lat. in, and migrare). As commonly used in the present day, however, the term has a more limited sense, being applied to the leaving of an old and thickly-peopled country to settle in one but sparsely inhabited. The great emigration fields at present are the British pos-sessions and the United States of North America, Australia, New Zealand, and South Africa. In 1860 the total number of emigrants from this country was 127,069; of whom 103,001 were from England, 3,872 from Scotland, and 21,596 from Ireland; 9,786 were from Scotland, and 21,506 from Ireland; 9,788 were for the North American colonies, 87,000 for the United States, 24,302 for Australia and New Zealand, and 6,881 for other places. The total number of emi-grants from the United Kingdom, from 1815 to 1860 inclusive, was 5,046,067. The subject of emigration has given rise to various important questions among political economists. It was long a prevalent notion that emigration, as tending to weaken a nation, ought to be discouraged; but sounder views on this subject now prevail, and the government has adopted various measures for the encouraging of this movement. In 1831 a government commission on emigration was formed, by which officers were appointed both at home and in the North-American colomes to watch over the interests of emigrants, and to furnish them with necessary information. In 1840 commissioners were appointed under the royal sign-manual to act as a land and emigration board. This board forms a subordinate department of the Colonial office. It regulates the sale of the waste lands of the crown throughout the colonies, and applies the proceeds of such sales towards the removal thither of emigrants from this country. It is the duty of the commissioners to see that the provisions of the Passengers Acts (15 & 16 Vict. c. 44, and 18 & 19 Vict. c. 119) are observed, which they do by means of agents, established at the several outports, who examine into the seaworthiness and fitment of emigrant vessels, the amount of provisions and water on board, the number of passengers, their healthy condition, and the various other matters required by the act. These agents further procure and give gratuitously information as to the sailing of ships and the means of accommodation for emigrants, and whenever applied to for that purpose they see that all agreements between shipowners, agents, or that all agreements between shipowners, agents, or masters, and intending enigrants, are duly performed. Emigration is one of the modes of relief provided by the Poor Law Amendment Act, 4 & 5 Will, IV, 2, 76, which empowers owners and ratepayers to raise money on accurity of the rates for the purposes of emigration. Free emigration can 'rarely or never be detrimental to a country, and there are many cases in which it is highly expedient to aid and encourage it. 'The late extraordinary emigration from Ireland (1846-54)," says McCalloch, "has done more perhaps to improve its condition than anything else that could have happened. In consequence of the diminution have happened. In consequence of the diminution that has been effected in the population, employment is more easily obtained, and the rate of wages has increased; a considerable progress has been made in many parts of the country in the consolidation of small patches of land into something like farms of a reasonable size and susceptible of a better system of cultivation; the towns and workhouses have been in part, at least, relieved of their pauper population; and agitation, crime, and outrage are less prevalent. Nor agitation, crime, and outrage are less prevalent. Nor is there any reason to fear that either in Ireland or anywhere clse emigration will be, or indeed can be, carried to excess.

carried to excess."

EMEGRES, em'-e-graiz (Fr.), a term applied to those individuals who left France during the revolution. After the taking of the Bastille, the princes of the royal family, Monsieur (Louis XVIII.), the count d'Artois (Charles X.), and the prince de Coudé, departed from France. They were speedily followed, in 1791, by all those who considered that their rights, we will again and property hash been interfered with im-1791, by all those who considered that their rights, privileges, and property had been interfered with improperly. Noblemen left their estates and domains, officers, with large numbers of private soldiers, priests, monks, and private individuals, passed over into Ger-

many, Belgium, Holland, Switzerland, and Piedmont. Very few of the émigrés had been able to save any property, and the greater proportion were consequently soon in a dreadful state of destitution. The princes themselves formed a court at Coblenz, with a government, ministers, and a court of justice. Com-munications were kept up with the foreign courts, and thus the feelings of the revolutionary party in France were more and more embittered against them. At last a body of émigrés, under the command of the prince de Condé, followed the Prussian army into Champagne. The republican government immediately put the strongest laws in force against the *émigrés*. Any person found assisting or favouring them in any way was condemned to death, and the lands of all *émigrés* were confiscated. Although many of them had refused to fight confiscated, Although many of them had refused to fight against their country, 30,000 persons were put upon the list, and condemned to perpetual exile from the soil of France. The last attempt made by the émigrés to penetrate into France by force of arms was in 1795, at Quiberon. The attempt was a failure, and the force belonging to the prince de Condé was broken up after the peace of Luneville, and sought a refuge in Russis. Under the Directory, many of the émigrés tried to return to France, and in 1801 Napoleon I. granted them a general amnesty. By the largest proportion this was bailed with delight, and they returned to their native land. Many, however, did not return until after the restoration of Louis XVIII. Those until after the restoration of Louis XVIII. Those who had remained loyal received many honours from the king, but were unable to regain their estates or their privileges, on account of the charter of 1814. In 1825, those *émigrés* who had lost their landed estates received a compensation of 30,000,000 francs yearly, on the capital of 1,000,000,000 francs. This great was, however, repealed during the July revolution.—Ref. Histoire des Emigrés Français, by Antoine de Saint Gervais Gervais.

EMIR, em'-cer (Arab.), a title bestowed in the East upon all the real or supposed descendants of Mahomet, and his daughter Fatima. The term is also applied to all independent chieftains, not only in the East, but in the north of Africa. In Turkey, the prerogatives of the north of Airca. In Turkey, the prerogatives of the emirs are unimportant, the principal being their exclusive right to wear turbans of a green colour, which was a favourite of the Prophet. Those who are emirs from the mother's side are held in higher estimation than those from the father's. All the Turkish emirs are placed under the superintendence of the Emir Parki The Ladder in case of wear of the Emir-Beshir. The leaders, in case of war, during early Mahommedan history, were called emirs, and the word has been used in connection with several es. The califs style themselves "Emir-al-Mume-prince of the Faithful; at the present time, in offices. Turkey, the title is applied to the rulers of provinces. The master of the horse to the sultan is called Emir-Achor; the standard-bearer, Emir-Alem; and the sur-

veror of markets, Emir Bazaar.

EMOLLIENTS, e-mol'-yents (Lat. mollis, soft), a term employed to denote those substances which are used externally, in medicine, for the purpose of softening the part of the body to which they are applied. They are mostly used in the form of poultices, fomentstions, &c.

EMOTION, e-mo'-shun (Lat. e, and moreo, I move), in Mental Phil., is a term frequently used as synony-mous with feeling, but which is strictly a sixte of feeling awakened through the medium of the intellect, and manifesting its existence and character by some and mannesting its existence and character by some sonsible effect upon the body. An emotion differs from a sensation in not springing directly from an affection of the body, and from a cognition, by its being pleasurable or painful. According to Lord Kames, an emotion differs from a passion in this, that it masses away without spring any desire, whereas it passes away without exciting any desire, whereas a passion is accompanied by desire. Emotions, regarded in themselves, can scarcely be called springs of action. They tend rather to quiescence and contemaction. They tend rather to quiescence and contemplation, fixing the attention on the objects or occurrences which have excited them. But they combine with springs of action, and give them a character and a colouring. The physical changes that uniformly accompany the mental passions and emotions show clearly the intimate connection that exists between the inward states of consciousness and the physica er

#### Emperor

corporeal organism. This is in some measure ac-counted for from the natural tendency of pleasure to cause an increased flow of the blood and vital energies This is in some measure accause an increased flow of the blood and vital energies to particular parts, and of pain to cause a depression or weakening of the vital functions. Why some special muscles should be affected differently from others,—why, for instance, anger should draw down the eyebrows and compress the lips, is a question that has not yet been satisfactorily solved.

has not yet been satisfactorily solved.

EMPEROR, em'-pe-ror (Lat. imperator), the supreme monarch of a nation; a title, the dignity of which is considered to be superior to that of a king. Originating with the Romans, and signifying merely the individual who had the imperium or ruling power, it gradually began to mean the possessor of the sovereignty of the Roman world. From the Romans, the title passed to Charlemagne, and when the Carlovingian family died out in the German brauch, the title became elective. elective. At present, there are three emperors in Europe,—the emperor of the French, an elected monarch; the emperor of Russia; and the emperor of Austria.

EMPEROR MOTH (Saturnia Pavonia minor), one of the most beautiful of the British species of moths. The expanse of its wings is about three inches. The colour is a greyish brown, tinged with purple; the back part of the wings has a band of pale brown and purple, the last band being much waved. In the centre of each wing is a large spot consisting of a black pupil with a yellow or grey iris, partly surrounded by a light blue crescent. The larva is of a green colour, pupil with a yellow or grey life, party surrounce of a light blue crescent. The larva is of a green colour, with a black band on each segment, ornamented with pink tubercles, bearing a whort of six hairs, diverging like a star. The cocoon of the emperor moth is very curiously constructed, the extremity not being closed, euriously constructed, the extremity not occupant but terminated by a converging circle of stiff hairs, which enables the insect to make its escape, but which enables the insect to make its escape, but entirely prevents the entrance of all intruders. This moth is of the same family as the silkworm moth (Bombycide), and the largest European species is the peacock moth (Saturnia pavonia major), which attains a width of five inches between the wings.

EMPETRACE, empe-trai-se-e (Gr. en, upon; petros, a rock), in Bot., the Crowberry fam., a small nat. ord, dicotyledonous plants in the sub-class Monochlamydes. They are small heath-like evergreen shrubs, mostly natives of northern Europe and North America. Their leaves and fruit are generally elightly acid. The berries of Empetrum nigrum, the crowberry, are eaten in the very cold parts of Europe, and are also employed in Greenland to prepare a fermented liquor. In Portugal the berries of Corema are also used in the preparation of a beverage which is said to have a medicinal value in febrile complaints.

EMPHASIS, em'fä-sis (Gr. en, and phemi, I speak), in pronunciation, is a mode of denoting one or more words in a sentence by a stronger and fuller sound of voice, in order to draw attention to them, or to show how they affect the rest of the sentence. Sometimes the emphatic words must be distinguished by a particular tone of voice, as well as by a stronger accent, On the right management of emphasis depends the Bre of pronunciation. With no emphasis, speech will be heavy and lifeless, and the meaning often ambiguous; and if the emphasis be misplaced, the meaning may be entirely perverted. There are two kinds of emphasis,—the simple and the complex; the friends of emphasis,—the simple and the complex; the former serving merely to point out the plain meaning of a sentence, the latter to mark some affection or emotion of the mind, or to give a meaning to words which ther do not usually bear. In writing, an emphatic word is commonly underlined, and in print it is usual to put it in italics.

EMPIRE, em'-pive (Lat. imperium), a term originally applied to that territory or extent of land governed by an emperor. The first empire was that of the ancient Romans, and it was divided into two great portions,—the empire of the East, or the Lower Empire, and the empire of the West. The empire of the East was greatly subdivided, according to the reigning dynasty. The empire of the West became the German, or Holy Roman empire, in the ninth century. At the pre-sent time the word empire is used to express any large extent of dominion. Thus, in erdinary language, the is customary to speak of the empire of Hindos-760

tan and the empire of Persia. The dominions of the queen of England are universally called the British

empire. Those countries in Europe which are empires empire. Those countries in Europe which are empires governed by emperors are France, Austria, and Eussia. Emprise, empiritos, from empeirio, experience), is properly one whose knowledge is founded on experience or observation. A certain sect founded on experience or observation. of Greek physicians took this name to denote their mode of treatment, as distinguished from that of the Methodists and Dogmatists. They died out, and are preserved only in the works of their adversaries; and preserved only in the works of their adversaries; and hence the term has long been synonymous with a charlatan or quack doctor, or more generally an ignorant pretender in science. In philosophical language, the term empirical means simply which belongs to, or is the product of, experience or observation, as distinguished from what is the result of reasoning or inference.

EMPORIUM, em-por'-e-um (Gr. emporion, tradiug-place), the term applied to receptacles in which wholeplaces), the term applied to receptacles in which wholesale merchants stow their goods in seaport and other towns. The word is originally derived from the Greek word smpores, which signified in the time of Homer one who sailed in a ship belonging to another. It afterwards was applied to a wholesale merchant, and in later years gained its present signification.

EMPYHRAM, cm-pi-re'-in (Gr. empuros, from sn, and sure first) a term mobiled by noute and others to the

pur, fire), a term applied by poets and others to the highest heaven, where the pure element of fire is supposed to exist. Milton frequently makes use of the word in "Paradise Lost;" as in the following lines:—

"Almighty Father from above,

From the pure empyrean, where he sits, High throued, above all height, bent down his eye."

EMU, e'-mu (Dromains Novo Holliandia, or Dromains ater).—This bird is widely diffused over the southern part of Australia, and is closely allied to the cassowary. When fully grown, it measures seven feet in length. The plumage is, for the most part, a mixture of grey and brown, paler below than above; head cowith feathers, which, together with those about the neck, are of a hairy texture. The long feathers observable in the wings of the cassowary are wanting in the enu; but instead of them it has real wings, though of so small a size as to be useless for flight. The legs are short and stout; there are three toes to each foot, and these are furnished with nearly equal claws. It is very swift, and when attacked kicks, does the ostrich, but not forwards, as does the latter bird, but more as a cow kicks, sideways or backwards. The nest of the emu is made by scooping a shallow hole in the ground in some scrubby spot; concerning hole in the ground in some scrubby spot; concerning the formatice of the nest, however, there are various opinions. Its eggs are dark green, and the number laid varies from seven to thirteen. Dr. Bennett remarks there is always an odd number, some nests having been discovered with nine, others with eleven, with thirteen. In sixt the arms, and others, again, with thirteen. In size the emu's eggs nearly equal those of the ostrich. They are eggs nearly equal those of the ostrich. They are monogamous, and the males, as in the case of the she's, perform the duties of incubation. The eggs are sales, person the dudes to include the reggs are eagerly sought after by the natives as an article of food, as is also the bird itself for the sake of its flesh, which, particularly that about the hind quarters, is said to be of good flavour. The emu would seem to have been unknown in Europe until the 16th century, when the Dutch, on their return from one of their earliest voyages to India, brought one from the island of Tara, For a considerable time this bird was exhibited for money at Amsterdam, and finally it came into the hunds of the emperor of Germany. In the year 1871 an emu was sent by the governor of Madagascar to the king of France, which was kept slive for four years in a menagerie at Versailles. A peculiarity in the anatomy of the emu should be noticed. "It is the largest bird after the estrich, from which it differs sufficiently in its anatomy, for it has short intestines and small coces, wants the intermediate stomach between the crop and the gizzard, and its cloaca does not in proportion exceed that of other birds."—Chuier. the Dutch, on their return from one of their earliest Cuvier.

ENAMEL, ENAMEL-WOEK, e-ndm'-el (Fr. émail).— The art of applying a coating of vitreous substances called enamels to a surface of glass or metal, and

Enamel

baking this in by a fusing heat, is termed enamelling. in the ordinary processes of the art the substances used to form the ground of the enamel are opaque, and must bear a higher degree of heat without fusing than the coloured enamels which are afterwards melted into them. They are made after a great variety of receipts, according to the uses to which they are to be applied. All those designed for metallic surfaces have a transparent base, which is rendered opaque by the substitution of combined oxide of lead and oxide of tin, instead of the oxide of lead used as one of its ingredients. Five different mixtures of the two oxides are in use, the proportions varying from 3½ parts of lead and 1 of tin to 7 parts of lead and 1 of tin the desired proportion are melted. The two metals in the dealers proposed as a state together, and the combined oxide is removed as fast as it appears upon the surface. When the oxidation is as thoroughly effected as is practicable, the product is well washed to remove any particles of metal that may have escaped oxidation, as these would greatly impair the quality of the enamel; for the same reason, it is essential that the metals themselves should be absolutely pure and free from the usual alloys found with them. One or other of the mixtures of oxides obtained by the method described is next melted with proper quantities of silica (pounded quartz), saltpetre, and a little borax: the last gives greater fusibility as its proportion is increased, and no more is used when enamel is to be applied upon copper or silver than upon gold. The plates are sometimes chemically acted upon by the enamel, and if the gold of the gold plates is alloyed with too much copper, the effect of this is perceived in injuring the appearance of the enamel. For making coloured enamels, either the opaque or transparent enamel serves us a base, and with it is melted a suitable proportion of some metallic oxide metted a suitable proportion of some metalic oxide as a colouring matter; for a blue enamel, the opaque is used with oxide of cobalt; for a green, oxide of chromium or binoxide of copper; for a violet, per-oxide of manganese; for a yellow, obloride of silver; for a purple, purple of Cassius; and for a black, the for a purple purple of Cassius; and for a black, the transparent ensmel is used with mixed oxides of copper, cobalt, and manganese. The different enamels, being prepared beforehand, are, when required for use, crushed to powder and then kept at hand under water, in vessels well covered, to protect them from all impurities. The metallic surfaces to be coated are cleaned by boiling in an alkaline solution, and are then washed with pure water. The copper alloy in gold may be dissolved from the surface by boiling in a strong solution of 40 parts of saltpetre, 25 of alum, and 35 of common salt. The enamel for watchfaces is made from arsenic instead of tin. Enamelalum, and 35 of common sait. The enamet for watch-faces is mude from arsenic instead of tin. Enamel-ling is an art of great antiquity. The ancient Persians and Arabians appear to have practised it upon earthenware and porcelain. The Egyptians also practised the art, and from them it is supposed to have passed to the Greeks, and thence to the Roman. That the Saxons were adepts in the art is proved by an enamelled jewel preserved at Oxford, bearing an inscription stating that it was made by order of the great Alfred. With regard to the different and delicate process of painting on enamel, Mr. Digby Wystt, in a paper read by him before the Society of Arts, describes the art as having passed through six stages from the time of its origin as a species of mosaic-work. The Byzantine Style was the earliest, and was in use The Byzantine Style was the earliest, and was in use in the Byzantine empire from the reign of Justinian down to the year 1300. Its most celebrated exponent was the artist-monk Theophilus. The process was chiefly characterized by the formation of cells, or compartments of gold fligree, in which the enamel was lodged. The Early Limages Style came next, taking its title from the city in which it was much practiced between the alevanth and fourteanth compractised between the eleventh and fourteenth cenprecision between the derivative and indirection centuries. In this method the cavities for the reception of the enamel were incised by a graver in a thick plate of copper. The third, or Early Italian Style, was practised between the thirteenth and sixteenth pusse of copper. Incoming, or nearly trauser style, was practised between the thirteenth and sixteenth centuries. The best-known exponent of this method was Ugolino Veri, who in 1338 made the shrine of Orvieto Cathedral. This swie seems to have taken a position midway between the old incised enamel and observated enamels which at a mback-man position. the painted enamels which, at a subsequent period, came in vogue. "It consisted," says the English

Cyclopedia, "in engraving on silver after the manner of medallic relief, and then floating it over with variously-coloured transparent pastes." The first to describe the process which has obtained the name of the Jewellers' Style was the celebrated Italian artist the Jewellers' Style was the celebrated Italian artist Benvenuto Cellini. In this process small objects of gold or silver, in the round or in high relief, were covered with a glass-powder paste, which was held in its position until vitrifaction was completed. The Late Limoges was the fifth style, and in this process the Late Limoges was the fifth style, and in this process the paintings were laid on in transparent colours upon an opaque paste. The chief characteristics of the sixth, or Miniature Style, were the introduction of a number of intervaluation of a greater number of firings, and a greater graduation of tints. This process, which is almost identical with that practised at the present day, may be regarded as that description of enamelting which most fully comes within the definition of fine-art work. Thus far we have treated the subject of enamel-work by describing its character and of application, also as a branch of the fine arts; but we have yet to consider enamelled ware as a manufactured product. About the commencement of the present century, Dr. Samuel Saudy Hickling obtained a patent for a process of enamelling cast-iron and other hollow were for saucepans, &c. His specification other hollow ware for saucepans, &c. His specification described the coating of iron vessels, &c., by fusion with a vitrifiable mixture composed of six parts of calcined flints, two parts of composition, or Courish stone, nine parts of litharge, six parts of borax, one part of argillaceous earth, one part of nitre, six parts of calx of tin, and one of purified potash. Or eight parts of calcined flints, eight of red lead, six of borax, six of calx of tin, and one of nitre. Or twelve parts of potars compatition eight of horax taus of parts of potter's composition, eight of borax, ten of white lead, two of nitre, one of white marble calcined, one of argillaceous earth, two of purified potash, and five of calx of tin. Or, lastly, four parts of calcined fint, one of potter's composition, two of with a contract of the calcined fint of home one of white marble calcined. of calcined flint, one of potter's composition, two of nitre, eight of borax, one of white marble calcined, half a part of argillaceous earth, and two of calx of tin. Whichever of these compounds be taken, it must be finely powdered, mixed, and fused. The vitreous mass is to be ground when cold, sifted, and levigated with water. It is then made into pap with water or gum-water. This pap is smeared or brushed over the interior of the vessel, dried, and fused with a broper heat in a muffle. Calcined bones are also suggested as an ingredient of a flux. The fusibility of the vitreous compounds will ware according to the heat gested as an ingredient of a flux. The fusibility of the vitreous compounds will vary seconding to the heat to be applied to the vessel, by using various proportions of the silicious and fluxing materials. Colours may be given, or gilding. In the year 1839 Messrs. Clarke secured by patent the use of the following composition and method:—100 lb. of calcined ground district the falls of the following composition and method:—100 lb. of calcined ground Clarke secured by patent the use of the following composition and method:—100 lb. of calcined ground flints, and 50 lb. of borax calcined and finely ground, to be mixed, fused, and gradually cooled. Of this 40 lb. are mixed with 5 lb. of potter's clay, and ground in water to a pasty mass. The vessel, after being thoroughly cleansed, is lined with a coating of this about \$\frac{1}{2}\$ of an inch thick, and left for it to harden in a warm room. A second coating is added, prepared from 125 lb. of white glass without lead, 25 lb. of borax, 20 lb. of soda in crystals, which have been pulverized and fused tegether, ground, cooled in water, and dried. To 45 lb. of this compound 1 lb. of soda is added, apon which the whole is mixed in hot water, dried, and pounded. Of this a portion is sifted over the other coating whilst still moist, and dried in a stove at a temperature of bolling water. The vessel is then heated in a stove or muffle till the glaze fuses. It is taken out, more glaze powder in subjected to heat. By this and other processes enamelled culinary and other utensils have now become chasp, and been caused to enter into common use. enamelled culinary and other utensils have now become cheap, and been caused to enter into common use. At the present time, among other processes, we find iron plates covered with coloured enamel, so as to imitate marble. Examelling of alates to imitate marble was introduced by Mr. G. E. Magnus at the Great Exhibition of 1861, for which a prize medal was awarded the inventor. The slates are first of all sawed, and planed to a uniform thickness, after which they are rubbeg amoch with polishing-stones. The ground-colour adapted to the marble to be imitated in

# Encampment

first laid on, and afterwards the variegated colours. The slate is then placed in an oven heated to 200°, and The slate is then piaced in an oven neared to zuv, and allowed to remain one night. In the morning, after cooling, a coat of varnish is applied, and the slab is once more placed in the oven, where it remains till the next day. Other heatings and varnishings succeed, once more placed in the oven, where it remains till the next day. Other heatings and varnishings succeed, till finally the process is completed by the polishing of the slab with pumice and rotten-stone.—Ref. Notice des Emuse exposés dans les Galeries du Louvre, by Count de Labords; Ure's Dict. of Arts, Manufactures, and Mines, 6th edition.

ENCAMPMENT. (See CAMP.)

ENCAMPMENT. (See CAMP.)

ENCAMPMENT. (See CAMP.)

ENCAMPMENT. (See CAMP.)

to in or into, and kaio I burn), a method of painting that was practised to a great extent among the ancients, from the time of Alexander the Great until the 7th or 5th century, from which time the art

the ancients, from the time of Alexander the Great until the 7th or 8th century, from which time the art gradually declined until the 1th century, when it seems to have been abandoned, and a practical knowledge of effecting it entirely lost. According to the historian Pliny, there were three methods of performing the process; the first and second seem, however, to be almost, if not entirely, identical; the first height the method of producing large pictures, and the ever, to be almost, if not entirely, identical; the first being the method of producing large pictures, and the second, of producing designs in miniature. In the first kind, the colour that was intended for the ground of the picture, after having been mixed with wax as a vehicle, was smeared over the surface of the wall or panel on which the painting was to be made, and carefully flattened. The design, whether it was a figure or an arabesque border or scroll-work, was traced on this ground with a sharp-pointed instrument, and the ground carefully removed, leaving the figure in a sort of shallow intaglio. The wall beneath was allowed sort of shallow intagito. The wan beneath was showed to show through, or the hollow was filled with wax colouring matter of another tint; after which the whole was blended together with a hot iron, a process which removed all traces of the junction of the different colours, and imparted a brilliant gloss to the tints that were used. The second method, in which the work was executed on ivory, must have been similarly done, and the wax colour which had been spread over the ivory removed by the graving-tool, to allow the surface of the ivory to furnish the design, or the design was out out on the ivory in intaglio, and the hollows thus obtained were filled with coloured wax. In the third had been spread over the colours ware loid on with a breach kind, in which the colours were laid on with a brush the colouring matter was mixed with wax dissolved in turpentine or some essential oil. The colours were laid on in a liquid state, and from the use of the brush an effect of light and shadow was obtained which it was impossible to produce in the other methods above was impossible to produce in the other methods showed described. When the picture was completed, the tints were blended together with a heated iron as before. About 1750, the lost art was recovered, and the practice of it revived, by M. Bachelier and Count Caylus in France. Both produced pictures in this style, and an account of the method need was published. It was warmly taken up throughout the south of Europe for some years, when it again fell into disuse. It was revived again at Munich in the reign of King Louis of Bavaria, and the interiors of many apartments in his palace, and various public buildings erected under his auspices, were executed in it. Since this under his auspices, were executed in it. Since this time, many fine works in this brilliant style of painting fave been produced; but it is far better suited for decorative work than for portraits, figures, or land-scapes.—Ref. Eastlak's Materials for a History of Painting in Oil; Montabert's Traité Complet de la Peisture, vol. viii.

ENGAUSTIC TILES, small earthenware tiles used for paving the passages in the nave and aisles of churches, and also the chancel. They are also used for paving entrance-halls and the vestibules of houses. They eare for the most part in two colours, red and vellow

are for the most part in two colours, red and yellow

are for the most part in two colours, red and yellow being most commonly used, and they are so called because they have a light arabesque pattern figured on them on a dark ground, or vice vered, in imitation of the early encaustic painting of the ancients. Excente, on(0)-sayn(q)t' (Fr.), in Mil., the name given to the inner and continuous line of defence works round any place; thus the line of bastions and intervening curtains inclosing the polygonal space which forms the interior of any citadel is termed the enceints. enceinte.

# Encyclopædia

ENCEPHALARYOS, en-sef-di-as-tos (Gr. enkephalos, that which is in the head; artos, bread), in Bot., a gen. of the nat. ord. Cycadaces, composed of elegant palm-like trees and shrubs, mostly natives of South Africa and Australia. From the stems of various species a kind of sago, called Caffre bread, is obtained.

ENCHANTMENT (Sea March 1988)

ENCHANTMENT. (See MAGIC.)
ENCHÉ'S COMET, eng'-kes, a comet of periodic recurespecially directed when it was discovered by M. Pons at especially directed when it was discovered by M. Pons at especially directed when it was discovered by M. Pons at elements to those of comets which had been observed in 1786, 1795, and 1805, led M. Enclet to calculate its in 1785, 1785, and 1895, led M. Engle to calculate its orbit, and he found the period of its revolution at that time to be just about 1,211 days. The comet reappeared in 1822, and on comparing its elements, and the time of revolution, with those of the comets of the years above monitioned, it was found that they were only successive apparitions of the same comet, and only successive apparitions of the same comet, and that it regularly appeared at its perihalion at intervals of rather more than 1,211 days. It was also found that its period of revolution was gradually growing shorter, at the rate of nearly three hours per revolution, which caused M. Encké to imagine that it was occasioned by some very slight resisting medium spreading throughout the whole of our solar system. It was named after M. Encké, instead of M. Pons, its discoverer in 1818, on account of the success of the former in determining its orbit and period of revolution, and predicting its reappearance in 1925, which happened at the time he had named for it.

mappened at the time he had named for it. ENCORE, on(g)-kore' (Fr.), literally, 'again,' 'once more,' an expression commonly used in places of public amusement by the audiences to express their wish for a repetition of a particular part of the per-

formance; as a song, &c.

ENCRINITE, en'-krin-ite (Gr. en, and krinon, a lily), in Geol., any fossil crinoid, or lily-like cchinoderm. (See CRINOIDEA and ECHINODERMATA.) The encrinites, which form a most important class of fossils, are characterized by their long many-jointed stalks, sur-mounted by flower-shaped bodies, which were furnished with numerous finger-like rays, capable of closing and expanding. Their internal calcarcous skeletons in expanding. Their internal calcareous sketetons in scattered joints and fragments are so abundant in scattered joints and fragments are so administ in some carboniferous limestones as to compose the greater portion of the mass; hence the term encrinal or encrinital limestone. The minuter joints of the flagers and rays are usually termed entrocki, or wheelstones, and the limestones in which they abound, entrockal limestone. The stalk of the encrinite was perforated by a canal, which kept the whole in vital sections and the excepted is only the reconsequently. perforated by a canal, which kept the wholen what action, and the separated joints have consequently some resemblance to beads,—a resemblance which has obtained for them the common names of "St. Cuthert's beads," "wheel-stones," and "pulley-stones. It is usual to apply the term Energiates to the general bearing accorded and amouth stans, though having now having rounded and smooth stems; those having pentagonal and ornamented atoms being termed Pentacrinites; those having pear-shaped receptacles, Apiocrinites; and those with receptacles forming more or less perfect cups, Cyathocrinites. Geologically, the encrinites range from the Silurian up to the present epoch. nites range from the Silurian up to the present epoch. They occur most abundantly in palsezoric and mesozoic strata, rarely in cainozoic, and are now only represented by the comatula or feather-star, and the all but extinct pentacrinus of the West Indies. Like the corals, their function seems to have been, to a great extent, the secretion of lime from the ocean,-whole

extent, the secretion of lime from the ocean,—whole strata of limestone, silurian and carboniferous, being almost entirely made up of their remains.

ERCYCLOPEDIA, or CYCLOPEDIA, en-si-klo-pe'-de-ā (Gr. paideia en kuklo, instruction in a circle), is properly a work professing to give instruction in the whole circle of human knowledge. The two terms are used synonymously; but the former is regarded as the more correct, as denoting "in a circle;" whereas the latter may mean, "of a circle." The use of the word, however, in its present signification, is entirely modern. With the ancients, encyclopædia was applied to the whole circle of learning, a knowledge of which was necessary to constitute a liberal ledge of which was necessary to constitute a liberal education. It comprised grammar, music, geometry, astronomy, and gymnastics. Various works of the ancients attempted to embrace the entire circle of

knowledge; but they exhibit no plan, and are only confused accumulations of the then known arts and sciences. It does not, lowever, appear that the anoisnts ever applied the term encyclopedia to any work of that kind. So far as is known, the name appears to have been first used in this sense by Alforabius, a learned Arab who flourished in the 10th century, and whose work, remarkable for its learning and completeness, is preserved in MS. in the library of the Escurial at Madrid. The indefatigable Dominican Vincent of Beauvais, who flourished about the of the Escurial at Magrid. The interniguous Dominican Vincent of Beauvais, who flourished about the middle of the 13th century, gathered together with wonderful diligence the whole knowledge of his time in three works: "Speculum Historiale," "Speculum Naturale," and "Speculum Doctricale," to which was soon afterwards added, by an unknown hand, "Speculum Morale." But these, and similar subsequent works of the middle-age period, which appeared under the title of "Summa," or "Speculum," manifest throughout a total want of a philosophic spirit. Several works bearing the name of Cyclopadia, or Encyclopadia, appeared in the 16th century; as Ringelberg's "Cyclopadia." (Basel, 1541), and Paul Scalich's "Encyclopadia, see Orbis Disciplinarum tum Sacrarum tum Profanarum" (Basel, 1559). In the beginning of the 17th century, appeared a work of no small merit,—Matthew Martin's "Idea methodicae et brevis Encyclopadiae, sive Adumbratio Universitatis" (Herborn, 1606); but the most noted and valuable of the early encyclopadias was that of John Henry Martin's and the statement of the carty encyclopadias was that of John Henry the early encyclopedias was that of John Henry Alstedius, a professor at Weissembourg, in Transylvania, which appeared in 2 vols. folio, 1630, a smaller work having appeared ten years before. It consists of thirty-five books, the first four being an explanation of the rest; then follow six books on philology; ten on speculative, and four on practical philosophy; three on speculative, and four of practical photosophy; three on the mechanical arts; and five on history, chronology, and miscellaneous topics. At Basel, in 1877, in 2 vols. folio, appeared the "Lexicon Universale" of Hoffmann, followed by a supplement of the same extent in 1883. the two being incorporated in four vols. folio, 1698. The dictionary form which was introduced by Hoffmann's work is that which has since been generally adopted in encyclopædias. It doubtless suggested the first English work of this kind,—the "Lexicon Technicum, or Universal Dictionary of the Arts and Sciences," by Dr. J. Harris, 2 vols. folio (London, 1706-10). A supplementary volume was afterwards added. It enjoyed great popularity till the appearance of Ephraim Chambers's Cyclopædia, in 2 vols. folio, in 1728. This presented a marked improvement upon its prede-cessors, and by an elaborate system of cross refer-ences, it was attempted to connect the various articles together, so as to form parts of various wholes. "No one," says the author, "seems to have perceived that one," says the author, "seems to have perceived that a dictionary is in some measure capable of the advantages of a continued discourse; and therefore we see nothing like a whole in what has in this sort been done." It was long nounter and a new things of the sort been done." It was long popular, and a seventh edition, in 4 vols. folio, appeared in 1778-85. Various other works of this kind were published before the end of this century, but the only one demanding particular notice is the "Encyclopædia Britannica," the first edition of which was published in 3 vols. 4to, Edinburgh, 1771. The fourth edition of this work appeared in 1810, in 29 vols., and the fifth and sixth, which were mere re-The fourth ection of this work appeared in 1810, in 20 vols., and the fifth and sixth, which were mere reprints, were followed by a supplement in 6 vols., in all classes of persons. It is divided into two parts of one volume each, the one for history and geography. In 1830-43; and the eighth and last in 1852-60. Dr. dhanbers's Cyclopædia, or New Universal Dictionary of Arts and Sciences," extending to 45 vols. 4to (1802-19). Of the other encyclopædias, may be mentioned the "British Encyclopædia," 6 vols. 4to, 1810-29, by John Wilkes; "Pantologia, or New Dictionary of Arts and Sciences," 12 vols. 8vo, 1816; Miller's "Encyclopædia Ludmiensis," 24 vols. 8vo, Edinburgh, 1816; "Oxford Encyclopædia," 10 vols. 4to, 1816; "Encyclopædia Poythensis," 2nd edition, 1816; "Encyclopædia Poythensis," 2nd edition, 23 vols. 8vo, 1826-23; "Partington's British of the third, 25 (from 0 to Phy), making in all 122 ros principles.

Oyclopædia," 10 vols. 8vo, 1833-36, in four divisions, of Arte and Sciences; Biography; Literature, History, Geography, Law, and Politics; and Natural History. In 1818 was begun the "Encyclopædia Metropolitana, or Universal Dictionary of Knewledge," on an original plan, comprising the twofold advantages of a philosophical and an alphabetical arrangement. The plan is by Samuel Taylor Coleridge, and is explained in his article "Method" prefixed to the work. The in his article "Method" prefixed to the work. The matter is arranged in four divisions:—1. the Pure Sciences; 2. the Mixed and Applied Sciences; 3. the Biographical and Historical articles; and 4. the Miscellaneous and Lexicographical articles. The work was completed in 1846, and extended to 25 vols. Ato; and since that time most of the larger articles have and since that time most of the larger articles have been reprinted in a small cabinet form. The plan of this work has been found to be too philosophical for practical purposes. The "Edinburgh Encyclopadia," edited by Dr. (now Sir David) Brewster, was com-menced in 1810 and finished in 1830, in 18 vols. The "Penny Cyclopadia" of the Society for the Diffusion of Useful Knowledge was begun in 1833 and com-pleted in 1843, in 28 vols. Three volumes of supple-ments were subscentily added. This work wheat ments were subsequently added. This work when it appeared was remarkable for the talent displayed in its production, and for its cheapness. The articles were all compiled from original sources, and the total expense for literary labour alone is said to have amounted to £45,000. The "National Cyclopædia," in 12 vols. 8vo, 1847-51, was an abridgement of the "Penny Cyclopædia." Perhaps the most objectionable feature in the "Penny Cyclopædia" was the too much space allotted to natural history subjects for a work of general reference. This has been remedied in the "English Cyclopædia" of Mr. Charles Knight, a work based upon the "Penny Cyclopædia," but divided into four distinct parts, any one of be purchased separately:—I. Arts and Sciences, in 8 vols.; 2. Natural History, in 4 vols.; 3. Biography, in 6 vols., and Geography in 4 vols. This publication was begun in 1853 and completed in 1861, and it may well be said to be "a really great and trustworthy work of reference." The Messrs, Chambers, of Edinard by the reserve burgh, have very recently brought out an encyclopedia based upon the last edition of the German "Conver-sations Lexikon." It extends to nine volumes. Based sations Lexikon." It extends to uine volumes. Based upon an earlier edition of the same work is the "Encyclopædia Americana," a popular dictionary of the arts, sciences, literature, history, politics, and biography, &c., edited by F. Lieber, in 13 vois. Svo., Philadelphia, 1829-33, with a supplementary volume in 1848. The "Popular Encyclopædia," 7 vols. 8vo., Glasgow, 1841, is little more than a reprint of this work. The "New American Cyclopædia," edited by George Ripley and Charles A. Dana, in 8vo., has recently been completed. Dr. Lardner's cyclopædia does not properly belong to this class of works, being does not properly belong to this class of works, being does not properly belong to this class of works, being a collection of independent works connected together by nothing but the title.

Lastly, among English works of this class, we would allude to the present,—"Beeton's Dictionary of Universal Information," a work which, while not attempting, like some of the others, to give learned and elaborate treatises on the different subjects, aims especially at being accurate and practically useful, a book for every day and everybody, and withal at such a price as to render it accessible to

Ato vols. The most pepular of all encyclopedias, and remarkable as being the first that attempted to popularize this class of literature, was the "Conversations-Lexikon," projected by Mr. Brockhaus, the publisher, in Leipsic, and first published there in 1812. It has since gone through a number of editions, the last of which, the tenth, in 15 vols., having appeared between 1851 and 1855. It has been translated into nearly all the languages of Europe, and, even when not translated, it has been largely adopted, or its plan carried out, by works of a similar kind. An abridgement of this work is published under the title of "Kleineres Brockhaus'sches Conversations-Lexikon für den Handgebrauch," wois, 1854-56. The more notable den Handgebrauch," 4 vols., 1854-56. The more notable of the other German encyclopædias are Meyer's "Grosse of the other German encyclopædias are Meyer's "Grosse Conversations-Lexikon für die gebildeten Stünde," in 38 vols. 8vo, Hildburghausen, 1840-52, with a supplement in 6 vols. 1853-55, and 8 volumes of plates; Pierer's "Universal Lexikon der Gegenwart und Vergangenheit, oder neuestes encyclopädischen Wörterbuch der Wissenschaften, Künste und Gewerbe," third edition, 34 vols. 8vo, Altenburg, 1840-46; "Oesterreichische National Enclyopädie," 6 vols. 8vo, Vienna, 1835-37; "Conversations-Lexikon der neuesten Literatur, Völker, und Staatengeschichte," 2 vols. 8vo, Leipsic, 1841-45; "Allgemeine Real Encyclopädie, oder Conversations-Lexikon für das Katholische Deutschland," by Dr. W. Binder, 12 vols. 8vo, Regenburg, 1846-50; and Dr. W. Binder, 12 vols. 8vo, Regenburg, 1846-50; and Herzog's "Encyclopadie für Protestantische Theologie und Kirche," 10 vols. 8vo, 1835-59. In France, the first volume of the celebrated "Encyclopedie, ou Dictionnaire Raisonné des Sciences, des Arts, et des Métiers," of Diderot and D'Alembert, appeared in 1751, and the seventeenth and last of the original series was pubseventeenth and last of the original series was pub-lished in 1765, 11 vols. of plates being added to the text, of which the first was published in 1762, and the last in 1772. A supplement was afterwards added, consisting of 4 vols. of text and one of plates, 1776-7. It is said to have been founded upon an unpublished French translation of Chambers's Encyclopedia, undertaken by an Englishman of the name of Mills. It numbered among its contributors writers of high name, as Voltaire, Rousseau, and others; but they were nearly as volume, houseau, anothers; but they were trary all persons holding very sceptical views on all religious matters. It soon became very popular, and various editions of it were afterwards published in France and other parts of the continent, and its principal writers other parts of the continent, and us principal writers came generally to be known as the Encylopédists. 'It was followed by another work of still greater extent, the "Encyclopédie Méthodique," begun in 1781 and not finished till 1832, comprising 201 vols. 4to, including 47 vols. of plates. Each science or art is treated separated in the statement of the stateme rately in a distinct volume or volumes; so that, in fact it forms a series of dictionaries on special subjects (48 in all), rather than an encyclopædia proper. The first edition of the Encyclopédie Moderne, ou Dictionnaire abrogs, des Sciences, des Lettres et des Arts, &c., par une Société de Gens de Lettres," was published in 28 vols. 8vo, with 2 vols. of plates; Paris, 1823-32. A third edition of this work was pub-blished in 27 vols., with 4 vols. of plates, in 1852-57, bissed in 27 vois., with 4 vois. of piates, in 1852-57, to which a supplement is in course of being added, the 10th vol., published 1961, coming down to the end of O. A useful work of this class is the "Encyclopédie des Gens du Monde," in 22 vols.; Paris, 1833-44. The French have also a "Dictionnaire de la Conversation des Gens du Monde," in 22 vois.; Paris, 1833-44. The French have also a "Dictionnaire de la Conversation et de la Lecture," in 68 vols. (Paris, 1839-51), of which a new edition begun in 1851 is still in progress, and a "Conversations Lexicon," founded upon the last edition of the German work of that name. Based upon the German: "Conversations Lexikon" are the "Enciclopedia Española," begun at Madrid in 1842; the "Biblioteca universal de Instrucciou," Barcelona, 1842; the "Almennyttight Dansk Konversations-Lexikon," by Larsen. Copenhagen, 1849; the "Svenskt Konversations-Lexikon," by Larsen. Copenhagen, 1849; the "Svenskt Konversations-Lexikon," by Larsen. Copenhagen, 1849; the "Svenskt Konversations-Lexikon," by Larsen. the "Almennyttight Dansk Konversations-Lexikon," by P. Larsen, Copenhagen, 1849; the "Svenskt Konversations-Lexikon," Stockholm, 1845; besides others in Holland, Russia, Hungary, &c. At Turin, a "Nuova Enciclopedia popolare Italiana," in 4to, was begun in 1856. Those encyclopedias that we have noticed have been more or less universal in their character and aim; but there exists another and also an important branch of this class of works,—those, namely, that are devoted of this class of works,—those, namely, the act worker to separate branches of literature, science, or art. The number of these works is rapidly increasing, and their character improving,—indeed, now there is scarcely a 764

department of human knowledge that has not its dictionary or encyclopædia. As knowledge increases, so must the demand for encyclopædias also increase. As the sphere of knowledge extends, the less able is man, with his limited powers and capacities, to embrace the with his limited powers and capacities, to embrace the whole circle; he must, therefore, have recourse to helps,—to books where he can get what information he wants in a comprehensive and easily accessible form; and to furnish this is the object of an encyclopedia. The importance of this class of works is not yet sufficiently the contract of the co The importance of this class of works is not yet suni-ciently recognized in this country. In Germany almost every family, even among the lower classes, has its encyclopedia. In the words of the editor of "Mac-millan's Magazine,"—"An encyclopedia in any man's house is a possession in itself for him and his family; an encyclopedia chained at Charing-cross for public reference would be a boon to London worth fifty drinking-fountains."

drinking-fountains."

Endemic, endemides, from en, among, and demos, the people), in Med., is a term employed to designate diseases peouliar to a certain class of persons, or to a particular district. Thus ague is an endemic disease in low marshy countries; the goitre in the Aips. They differ from epidemic diseases, which, without reference to locality or class, attack many persons at the same time in the same place, and are contagious; as influenza, scarlet fever, &c.

ENDIVE. (See CICHOBIUM.)

ENDOCARP, en'-do-karp (Gr. endon, within; karpes, a fruit), in Bot., the inner layer of the pericarp of a fruit. In certain fruits it is remarkably hard, and is termed the stone or putamen. In the almond the endocarp forms a thin woody shell; in the apple it is the core containing the seeds, and in the orange it constitutes the thin membranous partitions which divide the

pulp into separate portions. (See FBUIT.)
ENDOGENOUS PLANTS, or ENDOGENS, en-doj'-e-mus
(Gr. endon, within; ginomai, I am formed), plants
having stems which increase by the addition of new matter within. De Candolle's class Endogenæ corresponds with Monocotyledones of most botauists, and its essential characters are given in this work under

the latter head.

ENDONOSE, en-dos'-mose (Gr. endon, within; oemose, impulsion), a term originally applied by Dutrochet to the transfusion of gaseous bodies or liquids through membranous substances either of an animal or vegetable origin. He found that if two fluids of unequal density are separated by a membrane, the denser fluid will attract or draw to it the less dense. When the attraction was from without inwards, he called it endosmose; when from within outwards, he called it exos-mose. In spinals and vegetables this remarkable action of fluids performs a very important part. Upon it depend many phenomena connected with the circula-tion of the blood in animals and the circulation of the sap in vegetables. The substance contained within the membranous covers of the cells of plants is denser than the fluids without; hence a process of endosmose takes place by which the plant is supplied with nourishment from the soil. The bursting of some seeds and fruits depends upon endosmose; and some of the entozoa appear to exist by its action.

ENDOWMENT, en-dow'-ment (from Fr. endouairer, to endow), in Law, is the bestowing or assuring of dower upon a woman. It is sometimes used metaphorically upon a woman. upon a woman. It is sometimes used metaphorically for the settling a provision upon a parson, or building a church or chapel; and the severing a sufficient portion of the tithes, &c., for a vicar, towards his perpetual maintenance when the benefice is appropriated. ENYMON, en-dim'e-on, in Bot., the Blue-bell, a gen. of plants of the nat. ord. Likiacses. E. nutane is the species which adorns the woods and thickets of this country. It of downs are negality blue, weak which

country. Its flowers are usually blue, rarely white.

ENEMA. (See CLYSTER.)
ENEMES, ADERLING TO THE QUEEN'S. (See TREA-

SON.)
ENFIELD RIFLE. (See RIFLE.)
ENFILADE, en-fe-twid' (Fr.).—When the line of fire from artillery or musketry is directed along the front of a body of troops drawn up in line, instead of against it, or, so as to sweep the interior of any part of the defensive works about a place, or a trench in siege-works, from one end to the other in the direction of its length, it is called an enfillading

through the embrasure. Explushage, an(g)-flur-ashe (Fr.), a process for extracting the acouts from flowers by absorption. We are filled with flowers, and allowed to remain for a fat are filled with flowers, and allowed to remain for a time, varying from one to six days. The grease gradually absorbs the scent, the flowers being renewed from e to time throughout their period of blooming. The scent is afterwards separated from the grease by soak ing it in strong spirits of wine. Sometimes wire frames

covered with cotton cloths imbued with fine olive-oil are used instead of glass. In this manner the most delicate odours are extracted from flowers.

ENFRANCHISEMENT, en-frun'-tshiz-ment (Fr. fran-chise, freedom or right), is the act of admitting a person to certain privileges or liberties; as where one receives the freedom of a town corporate. In Law, the enfran-chisement of a copyhold is its conversion into a freehold by agreement with the lord of the manor. By 15 & 16 Vict. c.51, after the next admission subsequent to 1st July, 1853, either the lord or the tenant may require and compel the enfranchisement of the land in consideration of a gross sum or of an annual rent, fixed either by mutual agreement or by valuators and an umpire under the direction of the copyhold com-

missioners. (See Copynotic).

Engine, cn'-jin (Lat. ingenium, a contrivance), a term applied in Mech. to any compound machine or instrument composed of various parts, and intended to produce some effect by mechanical force; such as a pump, a windlass, &c. Some engines are distin-guished by connecting the word engine with the purposes for which they are used; as, steam-engine, fireengine, &c. Battering-rams, and machines of the same class, are called military engines.

class, are called military engines.

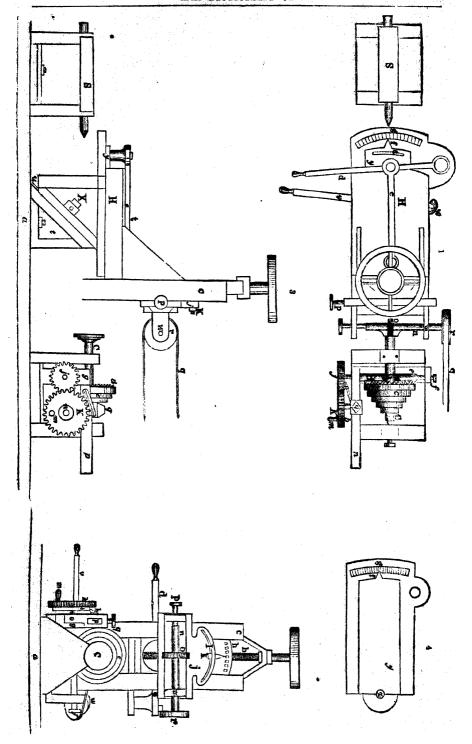
ENGINE, AIR. (See AIR-ENGINE.)

ENGINE, FIRE. (See FIRE-ENGINE.)

ENGINE, STRAM. (See STRAM-ENGINE.)

ENGINE, CUTTING.—A new and useful improvement of a cutting engine, or machine for dividing and cutting the teeth of cog, wheels, has been invented by an American mechanist, Mr. J. Gaume, of Cincinnati, Hamilton County, Ohio. In the accompanying woodcuts, fig. 1 is a plan, fig. 2 a side elevation, and fig. 3 a front view of the machine. The same letters indicate like parts in all the woodcuts. The leading indicate like parts in all the woodcuts. The leading object of this invention is to adapt the common lathe, by the addition of certain parts, to the cutting of cogwheels, chiefly for the use of small shops and esta-blishments, where a latbe and cutting engine are only occasionally used. The principle of the first part of this invention consists in adding to a lathe, and in combination with the mandrel thereof, a puppet made in two parts for carrying the cutter, the lower half to be attached in the usual manner to the bench, and connected with the upper one by an inclined plane, that the upper part may slide on the lower one at an angle of forty-five or any other number of degrees, for angle of forty-nee or any other number of degrees, for the purpose of carrying the cutter or curr over the wheel in the operation of cutting the cogs of bevel wheels. The second portion of this invention consists in combining with this puppet the cutter-frame, which carries the spindle of the cutter or curr by means of an adjustable horizontal slide, on which the cutteran adjustable nonzontal since, on when the cutter-frame moves to and fro to carry the cutter over the wheel in which the cogs are to be cut, the said slide being a plate with dovetsil or other formed edges, embraced by or embracing the cutter-frame, and attached at one end by a fixed bolt to the top plate of the puppet, and at the other by a serew bolt that attached at one end by a fixed bolt to the top plate of the pupper, and at the other by a serow bolt that passes through scurved slot, whereby the cutter-frame may be made to carry the cutter in its horizontal motion diagonally with the axis of the mandrel for the cutting of diagonal cogs. The spindle of the cutter or curr having its bearings in an adjustable slide that moves at right angles to the mandrel, to bring the

cutter over the axis of the mandrel (the bed of the slide being connected with a vertical slide in the cutterframe to adapt the cutter to wheels of different diameters) by means of a fixed bolt on one side, and a screw bolt passing through a curved slot on the other, that the axis of the cutter may be placed at any angle with a vertical line. The third part of the invention relates to the method of dividing the cogs, and consists in placing the index-wheel on a slide, that it may be divided to whale of any dealed, adjusted to a wheel of any desired number of cogs on an arbor that communicates by a screw or its equivalent to the mandrel which carries the wheel to be cut, so that by merely changing the wheel on this arbor, a single division-index may be used for the outling of any desired number of cogs. The fourth part of the invention consists in combining the dividing apparatus with the mandrel of a lathe, by means of cogs in the pulley of the mandrel, or on the mandrel, the dividing apparatus being sarranged that it can be thrown in apparatus being so arranged that it can be thrown in and out of gear. In the annexed engravings a repre-sents the bench of the lathe, C the mandrel with its set of cone pulleys (c), the face of the larger one of which is a crown cog-wheel (d), the cogs of which engage with the threads of an endless screw on arbore: the threads of this screw are shown by dotted lines in the plan, fig. 1. One end of the arbor runs on the point of a pivot screw (f), and the actor runs on the point of a pivot screw (f), and the other has a long journal that runs in a box in a standard (g), attached to the bench or the puppet-head of the mandrel; so that when the rear end is liberated from out of the cogs of the crown wheel, the mandrel may be used for turning the cog-wheel. In this way there is no danger of the wheel not being properly centred. When the of the wheel not being properly centred. When the wheel is to be cut, the arbor e is properly mounted, and its outer end is adapted by a collar and nut to receive a spur-wheel (j), of any desired number of cogs, which take into the cogs of the wheel K, one face of which is provided with the division-plate or index (b), and the other end with a handle (m) for turning it. This wheel is fitted to and turns on a stud-pin (n), projecting from a late (a) that slides on an arm (a) of it a standard (a) a plate (o) that slides on an arm (p) of the standard (g), that it may be set to the proper pitch-line of a wheel of any desired size on the arbor e, and there held by a screw (g). A spring-point or catch (r) is used to catch in the notches of the index or division-plate (b). From the preceding remarks it will be seen that with any given size of wheel on the arbor e, the number of cogs to be size of wheel on the arbor c, the number of cogs to be out may be varied by the motions of the dividing or index wheel, as in the ordinary dividing-engine, and that by changing the wheel on the arbor c, any variation can be given to these divisions. The wheel having been turned, and the dividing apparatus put in connection, the centring puppet-head (s) of the lathe is thrown back, and the extra puppet (t) is secured in place on the bench. This puppet is made in two parts (t, t), connected together by s dovetail or other slide (u) at an angle of 45°, or any other number of degrees, with the plane of the bench. The lower half (t) is secured to the bench, and the other (t) can be made to slide on it by means of a handle or lever (v), that turns on a fulcrum-pin (w) attached to the lower half, and connected with the upper half is in a plane parallel with the mandrel, and has a dovetail slide (y) connected with it at the forward end by a fixed bolt, a (see fig. 4, which is a plain view of this part), and at the other end by a screw bolt (a), that passes through a curved slot (see the dotted line) in the top plate, so that any horizontal inclination desired may be given to this slide, which is embraced by the bottom plate of the contraction of the supper to this slide, which is embraced by the bottom plate of the supper half is not be wall. cut may be varied by the motions of the dividing or to this slide, which is embraced by the bottom plate (H) of the cutter-frame (c), and which can be made to slide thereon by a handle or lever (d), that turns on a fulrum-pin attached to the puppet, and con-nected with the cutter-frame by a joint link (e), so that by the motion of this lever the attendant carries the cutter to and fro horizontally over the edge of the wheel to be cut, for cutting spur cogs in a direction parallel with the axis of the mandrel, or a curculon paramet with the axis of the mandrel, or inclined therewith as the slide may be set, to be indi-cated by a pointer (f) on the cutter-frame, and an index (g) on the top plate of the puppet. But when the machine is used for cutting the cogs on bevel wheels, then the cutting-frame is carried by aliding the upper part (t) of the puppet-head on the lowe



part, fig. 4; the inclination of this slide determining the bevel of the cogs cut. The forward part of the cutter-frame has a plate (h) that slides in it vertically by currer-reams has a plate (a) that slides in it vertically by means of a seriew (b), to adapt the cutter to any desired diameter of wheel to be cut; to this is connected another plate (j), that turns on a bolt, and further secured by a screw-bolt (k) that passes through a curved slot (l), by means of which the plate (j) may be turned on the fixed bolt as a centre, to give any desired inclination to the axis of a cutter; and this last-named plate is provided with dovetall ways, in which slides the cutter-carrier (m), which is a frame in which are the bearings of the spindle (n) of the cutter (o), so that this may be regulated endwise by a set screw (p). The cutter is rotated by a belt (q), that passes from any prime mover over a pulley (r) on the spindle. From the foregoing it will be seen that the cutter can be adjusted in any direction relatively to the axis of the mandrel that carries the wheel to be cut; and that, by means of one of the handles or levers, the cutter-frame can be moved to and fro to cut the cogs by sliding the cutter-carriage on the puppet in a hori-zontal plane parallel with the axis of the mandrel, which, by the adjustment of the ways or slide on the which, by the adjustment of the ways or side on the puppet, may be adjusted to move in a vertical plane projected from the axis of the mandrel, or at any inclination therewith, to cut oblique coga; or by means of the other handle, that the cutter-frame may be made to move with the upper part of the puppet on an inclined plane, to cut the cogs of bevel cogwheels. It will be obvious, from the plan of the above that the plan of the junction of the two halves of the puppet may be made at any inclination desired, to suit the bevel of the wheel intended to be out. This machine may be composed either of a single lathe, or of a complicated one, of any desired dimensions, and nothing need be added to it but a side-coupling to form the division. Its advantages are:-1. Turning the wheel on its points; it is thus cut on these same points with the axis, the length of which may be placed on the lathe; likewise by turning the wheel on the flat side, the hole in the centre and the circumference are cut without its being removed. 2. This machine can cut a machine on the circumference obliquely, to the right or left, with any desired incli-nation, and also the same with regard to the wheel on the side. 3. The wheel can be cut at any angle of 45°. This machine can take the place of, and even offers advantages over, the "Great Platform." It can be constructed of any dimensions, always being able to out the wheel, which can be turned on the lathe, even should it be fifteen feet in diameter. This machine can be adapted to a lathe placed upon a wooden bench, with only one hundred and fifty pounds weight of additional castings. The division extends to all numbers with the greatest precision.

ENGINEERING, en-jin-eer-ing (Fr. ingénieur, an engineer). Strictly speaking, the term engineering sbould only be applied to the art of making machines, and using them for the performance of any work; but its signification has been extended to comprehend the art of raising constructive works for civil or military purposes. Engineering, in its extended signification, may be considered as being divided into two distinct departments,—civil engineering and military engineering. A notice of the various duties and employments the civil engineer will be found in the following article. The military engineer is more particularly employed in designing, planning, and constructing works of defence and fortifications, as well as the siege-works, trenches, approaches, and mines of an attacking force investing a fortified town. He must accounting force investing a fortined town. He must also understand and be practically acquainted with the construction of the various kinds of bridges in use for the transportation of troops across rivers (see BRINGE, MILITARY), and the method of taking a survey of any tract of country by measurement or transpolation in an acquesta manage or account. by mere inspection, and judging the heights of hills and the distances of conspicuous objects from point to and the distances of conspicuous opects from point to point. In the English service these works are executed by a body of officers and men especially educated and enrolled for the purpose, and called the "Royal Engi-neers" or "Sappers and Miners." In warfare, the engineers are intrusted with any work of demolition 767

necessary to cover the retrest of an army, such blowing up bridges, &c.; and in forcing open the ga of a fortress, the hazardous enterprise of fixing to powder-bags and attaching the sancisson, or laying the train required to cause their explosion.

ENGINEERING, CIVIL (Lat. civilis, of or belonging to a state).—There are many duties and branches belonging to this important profession, which, in many respects, is allied to that of the architect, although this great distinction lies between the constructive works of each; namely, that the buildings raised by the engineer are works of great solidity, and of a use-ful nature, especially designed for the promotion of commerce, while those of the architect are structures of ornamental character and artistic design, of which the former, except in rare instances, are necessarily devoid. Among the chief duties of the civil engineer, devoid. Among the cnier duties of the civil angineer, is the construction of roads and great highways, aqueducts and canals, with all the necessary accompaniments, such as locks, lockgates, culverts, and bridges. All such structures as breakwaters and lighthouses, which are buildings requiring great strength and solidity in the construction of their masoury and foundations, and the formation of huge masses of earth, thrown up as embankments, to protect countries that are below the level of the sea from inundation, or low meadow lands from being flooded by rivers that are subject to sudden and rapid increase from heavy rains, come within the province of the civil engineer. He also constructs docks for the reception of shipping, quays, reservoirs, and watercourses for supplying towns with water brought from a disand fenny districts, and irrigates dry soil requiring moisture to render it productive, by various artificial means. Railroads, with their deep cuttings, immense embankments, lofty viaducts, dark tunnels, and roadways sometimes carried for miles on arches of brickwork,-their iron girder and other bridges, of enormous who the civil engineer. The formation of artificial harbours by throwing out piers and jettles; and the clearage of natural harbours from all obstructions, such as sunken rocks and sandbanks; and the construction of the great sewers and drains that run in every direction under our large towns and cities, all come under his care; and, in addition to this, he has to superintend the construction of the shatts and machinery of mines and coal-pits, to insure safety to the miners in their ascent and descent, and to secure proper and thorough ventilation in all parts of the mine. Another great branch of civil engineering is the manufacture of massive machinery, such as pumps, hydraulic and lever presses, looms, and steam-engines of all descriplever presses, looms, and seemi-rightee or an descrip-tions, whether they be locomotives, or for vessels, or for setting machinery in motion. In short, the civil engineer seeks to adapt the mechanical powers and their appliances, and bring them into such forms and combinations that they may furnish the means of saving the expenditure and waste of animal strength saving the expenditure and waste of animal strength and manual labour, and thereby cause the work to be done at a cheaper rate, and in a more efficient manner. It is only within the last three centuries that the professions of architect, painter, sculptor, and engineer, whether civil or military, have become separate and distinct callings. Those of the civil and military engineer have chiefly been elicited and established by the invasion of gunnowder and cannot. blished by the invention of gunpowder and cannon, which necessitated the employment of peculiar skill and close study in planning and constructing the works of defence that surround any place of importance; and the requirements of commerce, which has long since demanded, and still demands, canals, reads, resilvoads, and motive power beyond the constant con-trol of the winds and waves, for the conveyance of merchandise by land or sea. Although we may con-sider Archimedes as the first engineer of whom meation is made in history, in memorable connection with appliances of the lever and other mechanical powers, yet the early nations of the world, especially the Bgyptians, who raised and fixed in their present posireared the might monoliths known as Pompey's Pillar and Cleopatra's Needles, must have been pos-

sessed of engineers of to ordinary mental capacity. Sessed of engineers or no ordinary mental capacity. The blocks that form the Cyclopean walls of Tiryns and Mycaus, the marble columns and the temples of the Greeks, the sewerage and aqueduots of Rome, the underground structures for the drainage of the Assyrian city Nimroud, the canal of Xerxes that separated Mount Athos from the mainland, and the remains of those found in various parts of Egypt, Assyria, and the East, choked with sand and rubbish, all tell us of the magnificent schemes that the engineers of antiquity designed and carried out, whose names are lost to us, and whose works have been almost entirely destroyed. or at least rendered useless by neglect and the lapse of time. Among the engineers who flourished before the Christian ers, Archimedes, who so skilfully conducted the defence of Syracuse, is the carliest on record, unless we consider Hiram, the clever Syrian artificer, who sided Solomon in the building of the Temple, as an engineer, as he doubtless was, and more than this, the best of that period that was to be found through-out Palestine. The writings of Vitruvius prove him to have been employed in the structure of military to have been employed in the structure or mintary machines and works of defence, as well as in architecture, and the building of mills and manufacture of pumping-engines, and other works of utility for agricultural and commercial purposes. In the middle ages, and even in later periods, we still find the professions we have mentioned above combined in one person; for the eminent architect Brunelleschi, and Michael Angelo, the sculptor and artist, are mentioned as constructing fortifications, and the illustrious painter Leonardo da Vinci rendering an important service in the capacity of engineer by the construction of the first canal lock that was ever used to afford means of communication between waters on different levels. In our own country, the ecclessatics, in whom the greater part of the learning of the times seems to have centered, and who were the most famous architects of their times, as exemplified in the cases of William of Wykeham and Peter of Colechurch, were also the best wysenam and refer of Coleculation, were also the best practical engineers of the day, prior to 1500; and it is towards the close of the 17th century that we find the celebrated architect Sir O. Wren also acting as a civil engineer. Among engineers of the 16th century, Albert Durer, the painter and engraver, may be named, who wrote to some extent on the science of footification, but of this time considerable shill be seen that the science of the science fortification; but at this time considerable skill civil engineering had been attained, both in northern Italy and Holland, where every effort was obliged to be made to secure the inhabitants of these fertile lowland districts from the encroachments of the sea and the rivers, and to render the surplus waters of the country the means of obtaining an easy transit for merchandise and the productions of the soil from one merchandise and the productions of the soil from one point to another. At the end of the 16th century, the profession of the military engineer began to be brought into greater prominence, and to be considered as requiring special qualifications in him who might undertake the office, and Errard de Bar le Duc, De Ville, Pagan, Vauban, Cormontaigne, Coehorn, and Belidor, may be considered as the originators of the modern system of military engineering. In Parket bendor, may be commerce as the originators of the modern system of military engineering. In Eugland, although civil engineers had long been attached to English armies at home and abroad, yet the first smilitary corps of engineers, now known as the Royal Engineers, was not formed until 1787. But prior to this date, the rapid extension of commerce, and the de-mand for improved means of inland communication, had called the peculiar talents of Brindley into active eneration in the formation of the Bridgewater canal. speration in the formation of the Bridgewater canal. At this period, civil engineering began to be considered a distinct profession in itself, of considerable importance in this country, and the Eddystone lighthouse, and the numerous canals, docks, and railway works in every part of the country, and our magnificent iron steam marine, and improved weapons of all calibres, constructed by Smeaton, the Rennies, Telford, James Watt, the Stephensons, Looke, Sir Isambard Brunel and his son, Scott Russell, Armstrong, and Whitworth, and many others, show what marked and rapid process has been made in this branch of science. In and many others, show wast marked and rapid progress has been made in this branch of science. In 1793, a society of civil engineers was formed by Smeaton and others, under the name of the Smeatonian Society of Civil Engineers, and in 1818 the Institution of Civil Engineers was established, and incorporated

by royal charter about ten years after. A person who desires to become a civil engineer, and possesses sufficient attainments to master the necessary subjects, sufficient attainments to master the necessary subjects, should obtain an intimate knowledge of arithmetic and mathematics, trigonometry, statics, dynamics, hydro-statics, and hydrodynamics, mapping, surreying, and mechanical drawing, in order to enable him to con-struct plans and sections of lines of country for canals, ds, &c., and to calculate the cost of materials railroads, &c., sau to calculate the cost of insecriats and labour. He must also be acquainted with the strength and resistance of different materials in different positions and combinations, that he may be enabled to determine the principles of equilibrium in enabled to determine the principles of equilibrium in arches and roofs, the slope and form of his outtings and embankments for railroads, and to resist the pressure of water; and he must also have a knowledge of the mechanical powers and machinery, and the means of applying them. With the theories acquired in the attainment of a knowledge of these aubjects, practice must afterwards be combined; but in addition to practice and theory, good natural capacities and inherent talent of no ordinary nature are indispensable to cause a man to reach any degree of eminence in such a profession as civil engineering.

ENGINEERS, ROYAL CORPS OF, one of the component parts of the English army. It has for its duties the making and defending of all military works, and also the attack of similar works held by the enemy. the attack of similar works held by the enemy. The engineers form one regiment, and, unlike other branches of the army, are in continuous service both in peace and war. They are spread all over the world, and they are intrusted with the construction of all land and sea fortifications. In this work they are often assisted by civilians; but the engineer departoften assisted by civilians; but the engineer department of the country is responsible for the efficiency of the result. The corps of engineers was first formed in 1763, and in 1783 it was made a royal corps. In 1812 several corps of artificers, called sappers and miners, were placed under the engineers. Officers intended for the engineers enter the Royal Military Academy as cadets, and compete for their commissions at various periods. The head quarters of the engi-

neers are at Chatham.

ENGINERS IN THE ROYAL NAVY are those men who attend to the machinery on board the war steamers. When vessels of this kind were first employed, men were obtained from ordinary merchant steamers.
Many changes were afterwards made, and there are
now various grades of engineers in the navy. There now various grades of engineers in the newly. Another are inspectors of machinery, whief engineers, and assistant engineers, the latter class being subdivided into three parts. These are all commissioned officers, and are strictly examined before being admitted. the commencement of this year (1862), the number of naval engineers was reckoned at 1,089, with eight in-

spectors of machinery.

ENGLISH LANGUAGE, ing'-glish, is the vehicle of spoken and written communication between upwards spoken and written communication between upwards of fifty millions of people, and is as heterogeneous in its elements as it is widely extended in its sphere. "Latin, Greek, Hebrew, Celtic, Saxon, Danish, French, Spanish, Italian, German," says M. Müller, in his recent "Leotures on the Science of Language,"—"nay, even Hindustani, Maley, and Chinese words, lie mixed together in the English dictionary." It was long a popular, and probably somewhat partial, whim in this country, that Anglo-Saxon formed at least two-thirds of the sooken and written speech of it. But M. Thommerel spoken and written speech of it. But M. Thommerel has recently carefully gone over the dictionaries of Robertson and Webster, and has established the fact, that Anglo-Saxon stands in no greater a proportion to the words of merely Latin origin than the relation that 13,330 holds to 29,354. Yet the English lan-guage is essentially and truly a Teutonic or Saxon tongue; for it is not the extent of the vocabulary of iongue; for it is not the extent of the vocabulary of a language that gives colour to the title of that language,—it is to the grammar to which the tongue conforms that we must trace its scientific relationship. Now, whatever there remains of grammar in English—and, indeed, it is very little—obviously bears marks of being forged in a Teutonic workshop; and hence the necessity that there is for classifying it as such in the general philology of the world. In tracing the growth of the English language, it is usual to divide its history into the four periods of Anglo-Saxon (449 a.m.—1088)

A.D.), Semi-Saxon (1066 A.D.-1250 A.D.), Early English (1250 A.D.—1550 A.D.), and Modern English (1500 A.D. to the present day). These in their order: to the present day).

The Anglo-Sazza period of the language dates from a time when, in the 5th century, the Teutonic searovers first occupied the southern portion of the island, and drove back its original Celtic inhabitants to the north and west. No sooner had they done this, to the north and west. No sooner had they done this, than they settled in the island, and from that day to this the prevailing tongue of the country has been Anglo-Saxon, or English. This Anglo-Saxon was a Low-German dialect, bearing a close similarity to the old Frisic, which is usually recognized as the parent of the modern Dutch. After long years of social feuds and of national warfare, the absorption by Wessex, or West Saxons, of the various portions of the Heptarchy, in the 9th century, went far to make the ruling speech of the land the tongue of Berks and of Hants, the recognized centre of this clau. This fact not only gave colour to the more refined speech of the Anglo-Saxons, but, in addition to this, the fact of King Alfred, a native of Berks, rising up to be himself such an illustrious ornament to the letters of England, was a an illustrious ornament to the letters of England, was a special literary confirmation of what before had been simply asserted by the sword. When we compare the writings of Codmon, a North Anglian, and the writings of Alfred, two dialectical peculiarities at least seem at that early period to have prevailed in the island. There was the Northern or Anglian, which prevailed from the Humber to the Firth of Forth, and the Southern or Saxon one, which was spoken from the Humber to the English Channel. Now, which of those Angle-Saxon dialects entered specifically into the formation of the English tongue? Two answers have been given to this question by competent scholars. The one, that the classical Saxon of Wessex gradually gave way to another dialect, -that of the Midland counties; the other, that we must look for the real ground-work of our tougue in the gradual coalescence of all the leading dialects of England.— (See Sir Francis Madden's edition of Layamon's Brut, 1847.) The latter view, we confess, appears the more likely. main peculiarity of the tongue of the island at this early period was, that the influtives were still in an; the substantives, adjectives, pronouns, and articles, were declined like the Latin; and the plural was unlike the singular: in other respects it differed much less from our modern vocabulary than one might at first sight

Suppose.

The Semi-Suxon period was a transition era, and, like every era of the kind, one of contusion and one of promise. The monks were, of course, the learned class promise. and the medieval Latin in which they performed their Ave-Murias and their Paternosters, when they attempted to write their mother-tongue they fell into the grossest mistakes. The "Saxon Chronicle," 1173, and Layamon's "Brut" (about 1200), afford abundant specimens of this slip-shod style of Anglo-Saxon, and it is abundantly evident, from an examination of the inflections and genders of the language, that it was undergoing at this time a thorough breaking up. En is constantly substituted for on in the plurals of verbs; the final a is often discarded, weak rectevies constantly. the final e is often discarded; weak preterites occa sionally take the form of strong ones, and there is a marked uncertainty in the government of prepositions. There is another curious feature observable in the Anglo-Saxon of this time, - that although its date makes it reach a century or two beyond the Conquest of 1066, it nevertheless exhibits but few traces of Norman French. In that curious old poem which has just been referred to, the "Brut," there are not more than fifty French or Latin words in a composition of 32,000 lines! Norman French might be the language of the

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new word attached to the original one, whereas the old Saxon tongue, like a genuine element of the Teu-tonic, always expressed such ideas by a modification tonic, always expressed such ideas by a modification of this word. In the admirable poem of the "Owl and the Nightingale," written probably towards the end of the 13th century, the French language appears as a decided element in its vocabulary. It has likewise become, by the time we reach Chaucer, Gower, and Lydgate, a component part of English speech. And it is obvious that this modification was effected durch was through the likeway are and decided the second which was much more through the literary regard which was engendered in the breasts of those old poets for the French Fabliaux, and such like writings, than from any superior respect which they reluctantly paid to the speech of their Norman masters. Yet certain poets still clung affectionately to the old tongue, and in "Piers Plowman," and in a few others, we see examples of writers who still found the Anglo-Saxon sufficient for all their wants. The beautiful old ballad of the "Nut-brown Maid" (about 1500) is so modern in its style that it is difficult to believe it to be so ancient by a century at least. In the southern part of Scotby a century at least. In the southern part of Scotland again, and particularly the Anglian counties lying south of the Forth, the language of the people was to all intents and purposes identical with the language of the extreme south. And it is to be noted, in illustra-tion of this remark, that Barbour, a Scottish contemporary of Chaucer, wrote purer English than Chaucer did; that is to say, his poems were much freer from the foreign element of Norman-French. The northeastern dialects of Scotland have always presented a stumbling-block to the ethnologists; for it is unquestionable that the inhabitants of those counties speak a language which, in its grammar at least, is very nearly akin to that of Norfolk and Yorkshire. Yet in the vocabulary of the people, there are a considerable number of words of Norse or Scandinavian origin. The existence, during the 11th century, for a period of thirty years, of a Norwegian kingdom under the sea-rover Thorfion, in the extreme nor-h-east of the island, might partially account for this Norse element in the speech of the country. But how are we to account for the existence of an Anglo-Saxon grammar north and east of the Forth, or even of the Tay? for it is well enough known that the Norse languages it is well enough known that the morse amiguações are all widely diverse in their grammar from the Eaxon. No satisfactory answer has yet been given to this question; nothing but vague theories indeed have been formed regarding it. The close likeness of the two tongues to the north and south of the island did not last long after the wer of independence. So early not last long after the war of independence. So early as Dunbar, the best Scottish poet before Burns, pedautic Latinisms had usurped the place of pure Angle-Saxon, and in his best poem, the "Daunce," the striking personifications abound with what were then considered as barbarisms.

In the Modern English period of the language, it was to a great extent perfected as to its granmar, its still deficient as to its vocabulary. Of course the rules and forms of the grammar had still to be rendered workable and delicate by the use which great practice can alone communicate. It is to be observed, however, that it was much more in the ease and dexterity which the old forms of speech received, that this modern period is distinguished, rather than in any new modifications effected upon the grammar itself. Of course the additions which have been made to the English dictionary since the beginning of the 16th century have been immense,—a process which still goes on; but the effects of change on the glossary of a tongue are merely secondary. The changes, accordtongue are merely secondary. The changes, accordingly, which it has since undergone, are merely changes in style, or in the variety of modes in which different individuals express themselves. The English language is worthy, by its remarkable combination of force, precision, and fulness, of being, as it is already, the speech of nearly all the free nations of the world. If it cannot boast of native purity, it can at least boast of what is better than purity in a language,—the strength and copionsness, the delicacy and grace, the refinement and tenderness, in which its glossary abounds. If it is Teutonic in its stem, as the single s in the third person singular of the present indicative lines! Norman French might be the language of the court; it certainly was not the language of the people. The Early English period, again, of the language is worthy, by its remarkable combination of force, the Early English tongue now asserts itself throughout; yet it is still struggling to become. In the first place, it contrived gradually to get rid of all Anglo-Saxon inflections, particularly in the substantives and adjectives; the vowels a, a, u in final syllables are all represented by e, and the final no of the inflinitive has already begun to disappear. It constantly prefers to express themselves. The English language is worthy, by its remarkable combination of force, precision, and fulness, of being, as it is already, the troughout; yet it is still struggling to become. In the first place, it contrived gradually to get rid of all the substantive and adjectives; the vowels a, a, u in final syllables are all represented by e, and the final no of the inflinitive has already begun to disappear. It constantly prefers to express themselves. The English language is worthy, by its remarkable combination of force, wor

## English Literature

Rurope.—Ref. The Origin and History of the English Language, by George P. Marsh, 1862; and other very accessible works are those of Craik, Spalding, and Latham.

ENGLISH LITERATURE is modified in a highly important manner by the history of the English people. Bras of great literary progress have always been found to succeed those periods of the nation's history characterized by important social changes, and sometimes by national revolutions. The literary named of England may be conveniently arranged into three periods:—1. That antecedent to the Norman Conquest; 2. that extending from the Norman Conquest to the English Reformation; and 3. from the English Reformation to

the present day. These in their order.

1. The time preceding the Conquest has a literature composed in three distinct languages, and possessing merits of a highly important character. First, there is the Celtic, spoken by the Northern Scots, the Irish, and the Welsh. The "Annals of the Four Musters," compiled by Tigernach, records the authentic doings of the Irish people so early as the fifth century. No other nation of modern Europe can make a similar Then there are the Scottish Ossianic poems, boast. Then there are the Section Visionic Person, which, if they were gennine, would lead back the reader to the third century. Among the Welsh people, again, their triads are said to extend as far back as the sixth century, although nothing very authentic can be learned of the exploits of the famous Welsh prince Arthur of the Round Tuble, or of the enchantments of the renowned magician Merlin. The cultivation of Latin nowned magician Merlin. The cultivation of Latin literature in this country succeeded the introduction of Christianity into it. St. Ninian establishing himself at Whithorn, tried to convert Scotland late in the fourth century; St. Patrick made a similar attempt in Ireland in the fifth century; and St. Augustine laid the foundation of the Anglo-Catholic church late in the sixth century. Literary effort soon followed, and we meet as first in this honourable list the names of Alauin of Frigara and of Red. The "Clearage" we meet as first in this bonourable list the names of Aleuin, of Erigena, and of Bede. The "Gleeman's Song," the "Battle of Finnesburgh," and the "Tale of Beowulph," are the only stories of a Homeric cast which the Anglo-Saxon people possess. The latter, in of Beowulph," are the only stories of a moment can which the Anglo-Saxon people possess. The latter, in particular, resembles closely, in some of its vividly picturesque touches, the old liad of Troy. Doubless such remarkable religious poems as those of the monk Caedmon deserve to be mentioned in any summary of the literary history of England. Yet the Anglo-Sayon people were comparatively poor in poetry; but they were eminently simple and direct prose writers. Portions of the sacred Scriptures, Anglo-Saxon chronicles, sermons, glossaries, grammars, geographies, medical works, and dialogues, in their tongue, were all composed by their leading writers, Aldheim, Bede, and Alfred. It was chiefly through the influence of the latter, who discarded Latin in all his communications with his subjects, that the Saxon tongue made so decided a start as it did during the ninth century. This illustrious monarch, who both by his enlightenment and his many virtues has rendered his time one of the most brilliant in English history, used all his personal leisure and all his personal influence to render into his native tongue the works written in the language of Rome. He was not a dab at Latin, and he knew it, which may possibly account for the loose style of some of his versions, containing, as they do, stray stories, fine bits of description, and even a devout prayer of an occasion, all commingled, in the most distracting manner

to a modern classic, with the text of his author.

2. The Conquest brought with it a change of langauge and a change of manners in the court; but it could hardly modify the speech of the stubborn Eng-lishmen of those days. In no long time the lordly Norman nobles found it to be their interest to study the despised tongue of the people they had conquered; and it is owing much more to the influence of Chaucer and Gower, and to the literary class gene-

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and the extension of the monastic system, gave leisure for scholarship and induced thought. The close poli-tical intercourse that there was then with France improved both England and France in learning and in social manners. Such names as Lanfranc and Auselm, as Hales and Duns Scotus, as Michael Scot and Roger Bacon, show how entirely men were devoted, as they Bacon, show how entirely men were devoted, as they usually are in the infancy of a literature, where external peace and leisure will permit of it, to philosophy in both its branches of physical and metaphysical. The historical writers of the time, among whom we must mention William of Malmesbury, Geoffrey of Moumouth, Giraldus Cambrensis, and Matthew Paris, afferd a regressible offset to these subtle resource of the second states. afford an agreeable offset to those subtle speculators. Of course the learned language of the time was altoor course the rearrica language of the time was ano-gether Latin; and it is worth noting that the wit and fancy of the ecclesiastics could find as hearty expres-sion in the fine old drinking song of Walter Manes, beginning. "Mihi est propositum in taberus mori," or as Leigh Hunt elegantly renders it-" I devise to end my days in a taven drinking"—in the twelfth century, as they came to do in the sixteenth century, when Bishop Still improved the immortal bucchanalian song of "Jolly good ale and old." Personal satire and invective were much rifer in Mapes's day, than they became; and the weak king John and the charter of Runnymede afforded those disposed to employ those local squibs only too good targets to aim at. The "Gesta Romanorum," a singular medley of tales, apologues, and so forth, told often with much humour and pathos, have an interest of their own; and they possess, likewise, a horrowed grace. They have been instrumental in suggesting some of the noblest themes in our recent literature, and thus have double clams on our affection. The "Merchant of Venice" and "Marour affection. The "Merchant of Venice" and "Marmion," to go no farther from home, owe much to those old "Greats." These compositions resembled closely in their structure the French "Fabliaux." and have had a much greater influence on our literature. The fine old romances of "Havelok the Dane," the "Gest of King Horn," "Bevis of Hamptoun," "Guy of Warwick," and last and best of all, those glorious old legends written mostly in French, but composed by Englishmen, to celebrate the greatness and the downfall of the mythical king Arthur and his Knights of the Round Table, no English student of this literature will pass by. It was only the other day that we had an admirable poem from Alfred Tempson on the fragmentary materials of this very period. Meanwhile, an aumirable poem from Afred Tennyson on the frag-mentary materials of this very period. Meanwhile, the vernacular tongue of England, driven from the monasteries and the universities, was almost sclely de-pendent for its patronage and subsistence on the com-mon people of the land. It had no literature worth mentioning at this period; and it was rapidly merging into the Semi-Eaxon, as it is called, of which the carliest and best representative is the "Brut" of Lay-ton. The fundantly and fifteenth agentics branch The fourteenth and fifteenth centuries brought in, in truth, a new era into English history and Eng-John Wyeliffe and Geoffrey Chaucer were fought, and John Wyeliffe and Geoffrey Chaucer were born. The former deserves our ceaseless regard for his translation of the sacred Scriptures, the first ever effected by one hand (1380), and except Sir John Maundeville's one mand (1389), and except Sir John Maundeville's travels (1386), it is the first specimen of early English prose writing in our language. The latter deserves our undying esteem for his immortal "Canterbury Tales" (1390—1400), which, for their fine sportiveness and healthy pathos, their humorous simplicity and genuine tenderness, will be admired while the language ordures. It is to be remarked that the "Bruce" of Rarbour a Scutchusen an enin narrative written Barbour, a Scotchman, an epic narrative, written about 1376, is in purer English than those poems of about 137%, is in purer English than those poems of Chaucer of which we have just spoken. It resembles closely in its diction the English poem of "Piers Plowman." We can hardly do more than name a great many authors who crowd the canvas of the fifteenth and sixteenth centuries. Such are John Lydgate, whose "London Lackponny" (about 1430) is still read with interest; Alexander Burclay, author of the "Ship of Fools" (1500). Laby Skelton nuthor of the sation Chancer and Gower, and to the literary class generally, that French came materially to modify the existing language of England. These men knew French, because it was the tongue in which many interesting of books were written; and they gave it to the people of Fools' (1609); John Skelton, author of the satire books were written; and they gave it to the people of Fools' (1609); John Skelton, author of the staire balled in the firm belief that an acquaintance with twould advance their taste and improve their manners. Classical and theological learning were now King's Bench under Henry VI.; William Caxton, who much prosecuted. The founding of the universities, holds the honourable place of being the first who introduced printing into Britain (1474), his first book composed with types being the "Game of Cless;" Fabian (1512); Hall, an English lawyer and chronicler (1547); And Tyndale, who was burnt for heresy in 1536. The Sootch poetry of the period almost matches in interest and importance that of the south part of the island. James I, king of Scotland, led the way with his "Queen's Quhair;" Wyntoun, the chronicler (1420); Blind Harry, the author of the once highly popular performance known as "Sir Wm. Wallace;" Robert Henryson (died 1508), and wrote a beautiful poem called "The Testament of Cresseid;" Gavin Douglas, whose best work, among a considerable num-Douglas, whose best work, among a considerable number, is, without doubt, his translation of Virgil's "Æneid" into Scottish verse; and last and greatest of the poets of his country until the time of Burns, stands William Dunbar (died about 1520), whose "Daunce of the Seven Deadly Sins" showed him to have possessed imagination and humour, pathos and tenderness, boldness and vigour, in a very remarkable

3. The period extending from the English Reformation to the present time eclipses in brilliancy and gran-dour all the other eras of English literature. As the same sequence of events reigns in letters as in social life, the character of one era always determines the nature and complexion of the succeeding one. This is very observable in the Elizabethan age, on which we are now entering. The discovery of printing, and the discovery that all was not gospol that came from Rome, asservery that all was not gospol that came from Rome, were two as potent instruments as could possibly be put into the hands of literary men. What Skelton and Dunbar had begun, Spenser and Shakapere carried to a splendid consumulation. Doubtless an age so rife in new thoughts, and new images, and new forms of expression, could not have been heralded without its meed to blockled. The representations of Caracara of the could be a superior of Caracara of the statement of Caracara of of bloodshed. The names of Latimer, of Cranmer, of Ridley, and of Sir Thomas More, lie like dark shadows along the landscape of the literature of the time, men whose blood was shed by the rude laws that temporarily assumed the form of justice. The "Utopia" porarily assumed the form of justice. The "Utopia" of the latter is a work so proverbially imaginative that it has given the language a new word; yet so truly philosophical, and so full of elegant writing, as to be the wonder of the time at which it was produced. Roger Ascham, the learned tutor of Lady Jane Grey, and the writer of an excellent work, the "Schoolnaster," is another admirable miscellaneous writer of naster," is another additable miscellaneous writer of the time. As the English drama has already been taken up (see Drama), we need only mention here Sackville, who wrote the "Mirrour for Magistrates," and Brooke, author of the "Tragical History of Romeus and Juliet;" and the Scotsmen, Sir David Lyndsay, Roece, Major, McVille, and George Buchanan. "Lyndsay of the Mount," as he is sometimes called and George Rushumer, sell for a very defense, in chanan. "Lyndsay of the Mount," as he is sometimes called, and George Buchanan, call for a word of special mention, even in a summary like the present. The former was the companion of King James V. during his youth, and his unbeeded counsellor in old age. He wrote a huge kind of drama of the moral-play or interlude type, called the "Satire of the Three Estates" (1535), the irony of which is ordinarily aimed at the abuses of the clurch, but of which the humour is freshuses of the clurch, but of which the humour is freshuses of the clurch, but of which the humour is freshuses. abuses of the church, but of which the humour is frequently so gross as to render it unfit, at least, for general use. George Buchanan is universally admitted to have been one of the finest classical scholars who has appeared since the uge of Augustus. He mingled

complishments, but of vast compass and reach of undercompusaments, but or vast compass and reagent anatomatanding, and of minds truly creative; not men who perfected art by the delicacy of their taste, or digested knowledge by the justness of their reasonings, but men who made vast and substantial additions to the men who made vast and substantial additions to the materials upon which taste and reason must hereafter be employed, and who enlarged, to an incredible and unparalleled extent, both the stores and the resources of the human faculties." Not only was Shakspere taller by a head than any of his contemporaries, the men who proudly closed around him bulk larger, even to the critical eye, than any other collection of names in the entire roll of our literature. Even the minor dramatists of the time, such as Marlows and Chapman, Beaumont and Fletcher, Jonson and Drummond, are al-Beaumont and Fletcher, Jonson and Drummond, are almost the equals of any poets who have succeeded them. About the close of this period a number of sweet poets arose, who mostly wrote in a lyrical measure, though arose, who mostly wrote in a lyrical measure, though some of them were didactic; such as Fletcher and Browne, Drayton and Wither, Quarles and "holy George Herbert." During the period of the Restoration and the Revolution, the literature of the stage was exceedingly profligate. The court and the king had imported from France a love of genteel profligacy, which found its most fitting expression in the comedy of intrigue; and Wycherly and Congreve, Vanbrogh and Farquhar, are the dramatic scapegoass of the time. Yet the age was not wholly corrupt, for it could boast of such distinguished theologisms as Baxter, Owen, of such distinguished theologians as Baxter, Owen, Calamy, Collier, Leighton, South, Tillotson, and Barrow. This was also the time when Milton, who stands row. This was also the time when Milton, who stands in the front rank of poets, lived and sung of Paradise lost and of Paradise regained, writing "something," as he early hoped himself, "which posterity would not willingly let die." Marvel ridiculed the High Church, and Butler, of "Hudibras" fame, burlesqued Dissent; Walton angled, Looke speculated, Newton discovered, and John Pryden "found the English language of brick, and left it of marble." The literary history of the 18th century, and particularly of the reign of Queen Anne, has been censured severely by some, and praised to excess by others. It was patural that the praised to excess by others. It was natural that the critics of the period should be inclined to over-estimate the influence of the literature among which they lived; but many writers of the present day have decried it, possibly with a considerable touch of truth, for its polite scepticism and for its hollow insincerity. It has been glorified by its advocates as the Augustan age of English literature, and decried by its enemies as an age of utilitarianism and satire. The truth is, that both in poetry and in prose the form had come to be observed poetry and in prose the matter. Pope, of course, is the poetical chief of this age; and while he, no doubt, indulged much more than was meet in the most polished dulged much more than was meet in the most poissined and most personal satire, he nevertheless, as in his "Essay on Man," displays a fine power of lofty contemplation, and a faculty of expression so brilliant, so happy, and so copious, that we look in vain for the match of it in the entire range of English poetry. Addison is unmatched for grace and ease; Swift has no equal in rude, pointed vigour; and the sense of Johnson's ponderous sentences is frequently obscured by their size. If Young, Akenside, Thomson, Gray, Collins, Beattie, and Cowper were animated by a truer Collins, Beattre, and Cowper were animated by a truer sense of their duty in writing poetry than Pope was, the result shows that they accomplished much less than he did. This greatest poet of the century was Robert Burns. Its novelists were Richardson, Fielding, Smollett, Sterne, and Goldsmith; its historians ware Hume, Robertson, and Gibbon; and its philohas appeared since the age of Augustus. He mingled much in the politics of his time, yet found leisure to carse his genius in the retired ways of academic seelusion. The founding of the Scottish universities, and the institution of grammar and parish schools, which owed their origin entirely to the indefatigable labours of the reformer knox, bade fair to give to Scotland in important place in the history of Great Birtian. We now come close to the greatest era in the history of English literature. In all the essentials of true genius this age can give way neither to the best days of ancient Greece or Rome, of modern Italy or France, the greatest men the nation has ever produced come treoping up at the mention of Queen Elizabeth's name. There is Shakspere and Sponser and Sidney; there is Malkspere and Sponser and Sidney; there is Malkspere and Sponser and Sidney; there is Milton and Hobbes and Cudworth, and many other has been none so various, so diverse, and readers have increased almost as abundantly as the books have. This is the age of roviews and periodicals, and, indeed, of novels and romanoes. The greater struct results are than he didd. The greatest prect of the century was that tuey accomplished much as the hold diddid that greatest prect of the cid. The greatest prect prect of the cid. The greatest prect precise and Gobern, and Gibbon; ing. Smollett, Sterne, and Gibbon; ing. Smollett, Sterne, and Goberns, and Gibbon; ing. Books have been multiplied to an unprecedented degree, and readers have increased almost as abundantly as the books have. This ing, Smollett, Sterne, and Goldsmith; its instorians were Hume, Robertson, and Gibbon; and its philosophers were Butler, Berkeley, Clarke, Shaftesbury, Hume, Paley, and Adam Smith. The first half of the 19th century opens with a galaxy of poets more brilliant, probably, than any that have appeared during an equal number of years in the whole history of English literature. Coleridge, Wordsworth, Scott, Byron, Shelley, Keats, Campbell, and Southey, are the poets of this time. There might be periods of greater originality but there has been pour so various, so diverse, Smith, Habitt, John Fester, De Quincey, and Carlyle; the great preachers are Hall, Chalmers, and Irving; the philosophers are Stewart, Mackintosh, Bentham, Brown, Hamilton, and Stuart Mill; the men of science are Owen, Whewell, Faraday, Sedgwick, and Huxley; the novelists are Dickens, Thackersy, Bulwer Lytton, Charlotte Bronté, and "George Eliot;" the historians are Hallam, Macsulay, Thirlwall, Grote, Milman, and Carlyle. Ruskin stands alone as a writer on art. In poetry we have Tennyson, the Brownings. Matthew and Carlyle. Ruskin stands alone as a writer on art. In poetry we have Tennyson, the Brownings, Matthew Arnold, Smith, and Massey, besides a host of other. America has been active in sustaining her credit as a scion of Saxon stock, and can number among her writers W. Irving, Poe, Longfellow, Cooper, Prescott, Emerson, Bancroft, Hawthorne, and Lowell, who have given us excellent prose and very good verse.

ENGRALIND, en-gratid (Fr. engréler, to indent in curred lines, to variegate), the name given to a particular form of partition line used in Her. It consists of a series of semicircular or scalloped indentations, the points of the indentations being turned outwards, or

points of the indentations being turned outwards, or projecting into the field when the line is used, as it is principally, for defining the outline of any simple ordinary or sub-ordinary.

ENGRAVING, en-grai'-ving (from Fr. graver, to en-grave), the name given to the art by which plates of metal or blocks of wood are prepared by incision or excision in order to imprint designs of any kind on paper, calico, or similar materials. The term engra-ving is more strictly confined to work of this nature executed on wood or metal; but there are also many different branches of the art, to which specific names are applied: thus, the process of engraving dies in steel for coins and medals is called "die-sinking" (see Steel for coins and medians is called "die-sinking (see Dir-sinking), while engraving on precious stones and shells, which consist of layers of different colours, so that, by cutting away a portion of the upper coat, a dark figure may be produced on a light ground, or time versa, is termed "cameo-cutting." (See Cambo.) This branch of the art is somewhat similar to chasing, by which figures and patterns are produced in bas-relief on vessels of gold or silver. There is a great difference in the method used in preparing blocks of wood and plates of metal to effect impressions on paper. In the former, all the parts that are to appear white in the impression are cut away, and the lines which produce the imprint are left on the face of the block (see WOOD-ENGRAVING); but, on the contrary, in engraving on steel, copper, or zinc, the lines which are intended to produce the impression are hollowed out with a graving-tool. The Egyptians practised the art of engraving in bas-relief and intaglio on stone and metal at a very early age, and the Jews and Greeks probably derived their knowledge of the art from them. Indeed all the nations of the East have practized engraving of screens kinds from a very have practised engraving of various kinds from a very early period of their history, although none of them ever discovered the practicability of taking impressions ever discovered the practicability of taking impressions from incised plates, or wooden figures in relief. It was about 500 n.c. that a Greek named Aristagoras is said to have produced a map of all the portions of the world that were known to the ancients at that period, graven on a plate of brass. The incised lines were probably filled in with a coloured composition, so that the whole presented an appearance somewhat similar to the nicllo-work of the middle ages, or the accord kind of the early encapatic paintings. (See second kind of the early encaustic paintings. (See ENCAUSTIC PAINTING, NIELLO.) The method of pro-ducing incised engravings on plates of metal for the purpose of ornamentation, was followed without the slightest variation in the manner of execution from the earliest times until the discovery of the art of printing, and the mode of taking impressions from engraved plates. The art of obtaining an imprint from wooden blocks and types is ascribed to Laurence Koster, wooden blocks and types is ascribed to Laurence Koster, of Haarlem, who printed a book of rude wood engravings on Scripture subjects, with texts of Scripture at the foot of each print, entitled Speculum Humana Salvationis, about the year 1439; but the merit of the earliest discovery of printing from metal plates is assigned to Masso Finneguerre, of Florence, who took an impression on paper from a large silver plate known as the "Pax," which he was engraving in mello, about twelve years after the discovery of Koster, who was then printing from movable types out in metal. After

this, the progress made by the Germans and Italians in engraving on wood and metal was rapid, and before the close of the 15th century, books ware produced copiously illustrated with maps and engravings im-printed from metal plates. Prior to the time of Albert printed from metal plates. From the time of alores, burner, engraving had been effected by means of the graving-tool alone; but this great artist introduced the method of engraving known as etching, by which the design is bitten in, as it is technically called, by the corrosive action of a strong acid on the surface of the corrosive action of a strong acid on the surface of the plate, after the design has been traced with a needle on the etching-ground, with which the plate has been previously covered. It should, however, be stated that the discovery of the art of etching by means of acid is ascribed by some to Parmegiano, who lived at the same time as Albert Durer. The style of engraving called "mezzotinto" was introduced by De Siegen about 1840: considerable improvements were with convention of the art because the strength of the art because of the art because the strength of the art because of the art by the strong the strong the strong the art because of the art bea subsequently effected in this branch of the art by subsequently effected in this branch of the art by Prince Rupert. Copper was the material used for all engravings, whether of maps or landscapes, in line, aquatinta, stipple, or on soft ground, until about the year 1815, when soft steel plates were first used by Mesers. Perkins and Heath, of Philadelphia, instead of copper, which were afterwards hardened when the process of engraving had been effected. The tools used in engraving are greater as the line of the control of the contro process of engraving had been effected. The tools used in engraving are gravers or burins of all kinds and forms, made of case-hardened steel, etching-needles, scrapers for removing the burr thrown up by the graver or dry point, and burnishers to remove scratches from the plate, and to give a tone and finish to the engraving. The plate is prepared for the reception of the design by covering it with a coating of etching-ground, composed of a mixture of wax, resin, and gum-mastic. This is smeared over the plate after the scheme heated ears being taken to render the it has been heated, care being taken to render the surface of the ground uniform. It is then blackened by holding it over the smoke of a candle; and as soon as this is done the plate is allowed to cool. The outas this is done the plate is allowed to cool. The outline of the drawing or map to be engraved, which has
been carefully traced in pencil on paper, is next transferred to the ground by pressure, or by rubbing it with
a burnisher, and the design thus obtained is traced
through the ground with a needle. A rim is then
raised round the edge of the plate with what is called
"banking wax," and a solution of nitric acid and
water is poured into the hollow thus formed. When
this has remained on the plate a sufficient time to bite this has remained on the plate a sufficient time to bite in the outline, or the lighter parts of the engraving if it be a landscape or figures, the acid is poured off, and the parts which are dark enough are covered with a kind of varish called "stopping-ground," which resists the corresion of the acid, and prevents it from acting on the plate in the parts thus covered. The plate is then again subjected to the action of the acid, and the resistance of the plate is then again subjected to the action of the acid, and the process of explains the atomyte, ground to and the process of applying the stopping-ground to those parts which are sufficiently dark and the acid to those which are not dark enough, is continued until all the requisite gradations of light and shadow have been the requisite gradations of light and shadow have been obtained. The plate is afterwards fluished with the graver. In line engravings, the greater part of the work is done by the burin, a skilful engraver being able to produce a vivid representation of the surface of any object or material by a judicious combination of lines and dots. Among the best engravings of recent date may be mentioned that of Sir Edwin Landseer's beautiful picture of Titania, by Samuel Convince. Cousins.

ENGEOSSING, en-grose'-ing (Ang.-Nor.), among lawyers, means the making of a fair copy of a deed upon stamped paper or parchment, in clear legible characters.

Engrossing, in Law. (See Fourstalling.) Enhanmonic, an Law. (See Forstalling).
Enhanmonic, enhan-mon'-it, a term employed by
the ancient Greeks to designate that of their three
genera or scales which consisted of quarter-tones and
major thirds. Besides this they had originally another
kind of enharmonic much simpler and easier in crecution, and upon which the theorists of the old school
considered the great teams. considered the quarter-tones or diesis as innovations too refined and artificial. There is also a species of enharmonic called equi-rocal or enharmonic change, in which the notation is altered, but the same keys of the instrument are used.

ENIGMA, e-nig'-mā (Gr. ainigma), a description or

definition of a thing given in obscure or ambiguous terms, with the object either of hiding what the thing is, or of occasioning its discovery to come as a surprise. In ancient times enigmas were considered of such worth that envoys were sent between the Eastern monarchs solely for the purpose of solving them. They were often used as the vehicles for conveying truths of the greatest importance. As familiar instances of the enigma among the ancients, may be mentioned that which Sameon propounded to the Philistines, and also that of the Sphinx, which was solved by Œdipus. As a matter of literary display, the enigma has been a favourite at many times and among many nations. In France, during the 17th century, it was much in vogue; in fact, several ponderous treatises were written concerning its nature and history. Some of the greatest poets in Germany did not disdain to write enigmas, and several of Schiller's are incorporated in his published works. One of the most beautiful compositions of this kind is the enigma, generally attributed to Lord Byron, on the letter H, beginning. "Twas whispered in heaven, and muttered in hell." In the present day the enigma is looked upon only as a species of pleasant amusement by which the time may be beguiled.

Ennisyment, en-list\*-ment (Ang.-Nor.), in Mil., the name given to the act by which any one agrees to perform certain duties that are required of him as a sol-

form certain duties that are required of him as a soldier, during a certain period of time, for a fixed amount of remuneration in the form of daily pay and bounty money, which he receives when he joins the service. Enlistment is a voluntary act, and differs entirely from the compulsory system of drafting men for military service adopted generally in France and throughout Europe, and termed conscription. The only case in which military service is made compulsory in this country is that of balloting for the militia when any regiment; is deficient in numbers; but this is never any regiment is deficient in numbers; but this is never resorted to except in times of extreme urgency, and even then exemption can always be purchased by pro-viding a substitute. The period of enlistment in the British and Indian army is now fixed at ten years for the infantry and twelve for the cavalry, engineers, ar-tillery, and marines, to commence from the day on which the recruit takes the outh of allegiance, if he which the recent takes the outs of allegiance, if he have already attained the age of eighteen, or from his eighteenth birthday, if this happen after the time when he was sworn in. In the navy a man may enter for continuous service for five or ten years; but he is liable to be detained in her Majesty's service for six months more if it be found necessary to do so, or even for an additional period of five years by royal procla-mation, in event of his services being required through mation, in event of his services being required through any serious emergency. When the recruit has en-listed and received the customary shilling, he has twenty-four hours given him to consider the step he has taken, Sundays, Christmas-day, and Good Friday, being dies non in all cases. After this time has ex-pired, the sergeant is bound to serve him with a notice of his enlistment, and after the lapse of another entire day he must appear before a magistrate, who reads and explains to him the parts of the Articles of War that relate to mutiny and desertion, and administers the oath of allegiance. If, however, he does not still desire to become a soldier when he appears before the magistrate he is at liberty to draw heigh on returning magistrate, he is at liberty to draw back on returning any money he has received from the sergeant as enlistment money or pay, with twenty shillings in addition as a fine for his withdrawal from his engagement, which is termed "smart money." Apprentices may not enlist without the consent of their masters. may not enlist without the consent of their masters, who may claim them from the military authorities within a month from the period of enlistment. Apprentices enlisting and concealing the claim that their masters have on their services, are considered as having obtained money under false pretences, and may be prosecuted and punished accordingly. They are also liable to serve as soon as they are out of their apprenticeship, and may be apprehended as deserters if they do not surrender themselves to a recruiting officer.

EMOCH, BOOK OF, 6'-nok, is one of the apocryphal books of the Old Testament, and believed by some to be cited by St. Jude when he says, "Enoch, the seventh from Adam, prophesied, saying," &c. It is

generally supposed, however to have been fritten after the establishment of Christianity, from the frequent allusions that are made in it to passages of the New Testament; and it is probable that the author took occasion, from the words of St. Jude, to perpetrate the forgery. As for St. Jude himself, it is probable that he cites, not from any book of Enoch then subsisting, but from general tradition. The book was common in the early church, but was not generally received as canonical, and appears to have been lost about the 8th century. Bruce, however, when in Abyssina, was fortunate enough to obtain three complete MSS. copies of this work. An English translation was published in 1828, by Archbishop Lawrence, and the Ethiopic version in 1838. Several German editions have appeared. The book is chiefly taken up with a relation of the prophetic visions of Enoch regarding the fall, heaven, hell, nature, astronomy, the future of the Jewish people, &c.; the whole being characterized by such absurdities as

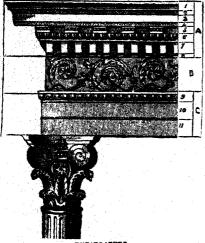
the whole being characterized by such absurdates as to render it unworthy of any credit.

ENSIGN, ent-eine (Fr. enseigne; Lat. signum, a standard), in Mil., the name given to commissioned officers of the lowest rank in the line. The ensign ranks immediately after the lieutenant. It is the duty of the senior and junior ensign in every regiment of infantry to carry the colours,—the former carrying the queen's colour, or union-jack, and the latter the regimental colour, which is generally of the same tint as the facings of the regiment, and has a small union-jack in the corner and the number of the regiment in the centre, with the names of the battles in which it has been engaged emblazoned round it on embroidered scrolls. In the foot-guards ensigns rank as lieutenants, and in the engineers, artillery, and marines, the duties are performed by a lieutenant, who receives less pay than the senior lieutenant of the company, and was formerly atyled second lieutenant. The ensign originally derived his title from the duty that devolved on him of carrying the standard, which was formerly amark or rallying-point for the soldary in battle. In the present day it is a point of honour for a regiment to preserve its colours, and the ensigns who carry them are closely attended by a guard of sergeants, who wear a flag curbroidered on the arm above their stripes, and

are called colour-sergeants.

EXTABLATURE, en-tib'-listure (Fr. entablement, Sp. entablement), in Arch., the whole of the superstructure that is supported by two or more columns which esustain the roofing of a portice or entrance to any building of importance built in the classic style of architecture. The entablature sometimes supports a pediment with sides sloping downwards from the contreto either end. It is divided into three parts,—the srchitrave, the frieze, and the contice. (See Architerave, Frieze, Cornice.) The depth of the entablature and its component parts is determined by the diameter of the lower end of the shaft of the column. (See Architecture). The entablature in each of the very orders of architecture is distinguished by certain methods of treatment and decoration. The Tuscan entablature consists of a plain architrave and frieze separated by a narrow projecting fillet, and surmounted by a cornice formed of simple mouldings, as fillet, and cymatium. In the Doric entablature, guitae, or rain-drops, are attached to the under-side of the fillet or tentia that separates the architrave from the frieze, immediately under the triglyphs that ornament he latter; mutules are also placed on the cornice above the triglyphs. In the remaining orders the architrave is broken into two or more fillets, or facias, projecting one above another, with an ornamental immediately under the fillet above it. The frieze is generally plain in the Ionic order, as in the Doric, although it is sometimes enriched, as were also the sustopes, or rectangular spaces between the triglyphs on the frieze of the last-named order; but in the Corinthian and Composite orders it was richly adorned with sculpture in bas-relief. The cornice in the Ionic, Corinthian, and Composite orders it was richly adorned with sculpture in bas-relief. The cornice in the Ionic, Corinthian, and Composite orders it supported on a moulding curiohed with dentils, and finished above with an ogee moulding; but in the Corinthian order the cornice is supported o

tioned; while in the Composite order mutules are substituted for the carvet modifilions. In the accompanying engraving of an entablature of this order, the three principal component parts—the cornice (A), the frieze (B), and the architrave (C)—are clearly and distinctly separated by marginal lines, extending to the right and left, which indicate the exact space occupied by each. The cornice admits of a great number of sub-divisions. At the very top is the symstimm (1), formed by the moulding known as the syms rects, and resting on an enriched egge of bed-mould (2). Below this is



ENTABLATURE.

a fillet termed the corona (3), resting on a similar beda fillet termed the corona (3), resing on a similar bet-mould (3), which is supported in its turn by a mutule band (5), consisting of a fillet adorned with mutules at regular intervals. Between the mutule band and the fillet enriched with dentils (7), or the dentil-band, astit is frequently termed, is an echinus moulding (6), and below the dentil band another narrow moulding (8), below the dentil band another narrow moutaing (o), which serves as a bed-mould for the entire cornice. waten serves as a nea-mount for an entire contest. The middle portion of the entablature,—the frieze, consists of a broad fillet only, enriched with a scroll-work of leaves and flowers. The architrave is divided into three parts,—an echinus moulding, distinguished as the architrave moulding (9), and two fillets separated by a parrow head-moulding, and termed the facia (10) and lower facia (11) respectively.

ENTAUL, en-tail, in Law, is a term commonly applied to the form of an estate, technically in England and Ireland called a fee tail, and in Scotland a tailrie. It is said to be derived from the French tailler, 'to cut, oither because the heirs general are by this means cut off, or because this estate is a part cut out of the whole. An estate in fee tail is a limited fee, as opposed to a fee simple; it is that which a man hath to hold to him and the heirs of his body, or to him and particular heirs of his body, according to the will of the donor. Previous to the passing of the statute de Donis, 1285, lands, if to the passing of the statute de Donis, 1285, lands, if to lessen the injurious effects of this system, and which given to a man and the heirs of his body, were regarded as conditional estates in fee simple; but the nobility, being surious to perpetuate their possessions in their own families, procured the passing of that statute. It emacks, that from thenceforth the will of the donor is read to be observed, according to the form in the deed of gift, and that the tenements so given (to a man and the heirs of his body, or the heirs male of his body, or the heirs of his body, or the heirs male of his body, or the heirs of his body, or the large, where the denor or his heirs. Estates failed, should revert to the denor or his heirs. Estates failed, should revert to the denor or his heirs. Estates failed, should revert to the denor or his heirs of the ten; the larger, where the gift is to the heirs of the some of the heirs of his body by a particular pore us; as by his now wife. In the former case, his issue in general, by all

and every marriage, is, in successive order, capable of inheriting the estate tail; in the latter, no issue can inherit but that of the two designed. Each of these may be again either in tail male or tail female. "The establishment of this law," says Blackstone, "occasioned infinite difficulties and disputes. Children grew disobedient when they knew they could not be set aside; farmers were onsted of their leases made by tenants in tail; for if such leases had been valid, then, under colour of long leases, the issue might have been tenants in tail; for if such leases had been valid, then, under colour of long leases, the issue might have been virtually disinherited; creditors were defrauded of their debts; for if tenant in tail sould have charged his estate with their payment, he might also have defeated his issue by mortgaging it for as much as it was worth. Innumerable latent entails were produced to deprive purchasers of the lands they had fairly bought,—of suits in consequence of which our ancientbooks are full; and treasons were encoursed, as estates tail were not liable to forfeiture longer than for the tenant's life." But the nobility were always fond of this enactlife." But the nobility were always fond of this enactment, because it preserved their family estates from necue, occause it preserved their family estates from forfeiture. At length, however, in the twelfth year of the reign of Edward IV., it was decided, in the celebrated Taitarum's case, that by means of certain fictitious proceedings, known by the name of a common recovery, suffered by the tenant in tail, he should convert his estate into a fee simple should. recovery, sunered by the tenant in tail, he should con-tert his estate into a fee simple absolute, and her all persons whatever claiming the estate tail, or any estate ulterior thereto; and by long use and acquiescence these recoveries became the legal mode of conveyance by which a tenant in tail might dispose of his lands and tenements. Afterwards, in the reign of Henry VIII., estates tail were declared to be forfeited on any conviction for high treason; and soon after, in the same reign, certain leases made by tenants in tail, which do not tend to the prejudice of the issue, were allowed to be good in law, and to bind the issue in tail. The peculiar privileges of tail estates were still further curtailed by subsequent statutes, but most of all by 3 & 4 Will. IV. a. 74, enabling a tenant in tail, by an ordinary deed of conveyance, duly enrolled, without any indirect or fictitions proceeding, to aliene in fee simple absolute, or for any less estate, the lands custailed. Subsequently, by 1 & 2 Vict. c. 110, entailed estates were rendered liable for ordinary debts; and further, by 19 & 20 Vict. c. 120, a tenant in tail may demise the same from time to time for any term not exceeding twenty-one years. Estates tail have those or gradually unfettered, and are now subject to not tend to the prejudice of the issue, were allowed to been gradually unfettered, and are now subject to even less restraint than is attached to conditional fees even less restraint tran is attached to bound an ear at common law, after the condition was performed by the birth of issue. In Scotland, the history of the entail system differs from that of England, in so far as it was there built and strengthened by the ingenuity of the lawyers, who, as fast as assailable points were dis-covered in the form of the deed, fortified it with new covered in the form of the deed, fortilled it with new classes. Thus, what are known as the "prohibitory," "irritant," "resolutive" clauses, were introduced; and by a statute of the Scottish parliament in 1685, entails in that country were reduced to a systematic form. The injurious effects of this enactment were widely felt in Scotland during the 18th and nearly the half of the 18th centuries; but it came to be the practice in law to insist upon the very strictest interpretation of the deed; and any error in the form, or even a clerical to insist upon the very strictest interpretation of the deed; and any error in the form, or even a clerical error, as the omission of a word, would vitiate the entail. At length, Andrew Rutherfurd, the then lord advocate, introduced a measure into parliament to lessen the injurious effects of this system, and which was embodied in 11 & 12 Vict. c. 36. By means of this act, which came into force on the let of August, 1800 persons than in existence and helding under

Entomology

in the outset may be high and the pulse strong and hard, it soon becomes small and weak or wiry. The names and vomiting are often most distressing, its of retching often constnuing after the stomach has been deprived of its contents. In bad cases, as the disease proceeds, the abdomen begins to swell and becomes tense and symmentic; hierary sometimes comes on; the pulse intermits, or bests irregularly; the extremities grow cold; the features are sharpened and ghatly; cold sweats break out; the pain, perhaps, ceases, and death at length acts; in. The brain is generally unsflected, and the intellect remains clear; but sometimes delirium occurs late in the disease. Entertits may arise from warious causes, particularly from cold times defining occurs late in the disease. Entering may arise from wirrious causes, particularly from cold and wet, more especially applied to the feet or legs, or cold drinks when the body has been previously overheased. Hardened fareal matters, arising from indigestible substances taken into the stomach, may also produce this disease. Strangulated hernia, or the involution of one fold of the intestine within aucher, may induce this disease, by causing a complete obstruc-tion to the passage of the contents of the bowels. Various diseases bear a considerable resemblance to enteritis; but that which most closely resembles it is colic, which, indeed, often passes into enteritis. Colic, which, indeed, often passes into enteritis. Colic, however, is distinguished from enteritis by the absence of fever, the difference in the state of the pulse, the pain occurring more in paroxyems, and by being usually mi-tigated by pressure; whereas, in enteritis, it is in-creased. The ordinary remedies employed in inliammation must be resorted to in this disease. Blood is to be freely taken from the arm, leeches are to be applied to the abdomen, and afterwards fomentation-cloths. Great care is necessary in the administration of purgative medicines, as they frequently tend to agor purpasses measures, as they frequently tend to ag-gravate the symptoms, and ought not to be resorted to till after the liceding. The disease is to be cured by removing the inflammation, not by opening the bowels. The judicious administration of opium and bowels. The judicious administration of opium and calomel is often of the greatest benefit in this disease; and the best laxative to give, in order to clear out the bowels, is easter oil. Though there may not be much danger in mistaking colic for cuteritis, the greatest danger may arise from mistaking enteritis for colic. Stimulants, cordials, or carninatives, which are often of the greatest service in colic, would greatly aggravate the symptoms in enteritis. vate the symptoms in enteritis.

Take the symptoms in enterius.

ENTHUSIASM, en-thu'-ze-azm (Gr. enthousiaemos, inspiration), is an exalted condition of mind, in which
the imagination is inflamed and exalted, thereby conceiving and expressing extraordinary and surprising things. The excesses of the imagination are of two kinds; viz. I. When, within its proper sphere, it gains so great a power that all the other affections and motives of human nature are overborne and excluded; and 2. when the imagination trespasses upon ground where it should have little or no influence, and where it can only prevent or disturb the operation of reason and right feeling. In the latter case the solvicties of good sense and experience, the motives of interest, and even the dictates of rectitude, may be set at marght, and the commonest objects may be invested either with preposterous charms or with unreal deformities. which preposerous charms of with unreal deformaties. There are, however, perhaps few minds that are not to some degree subject to constitutional fictions, which to a greater or less extent intercept the view of things as they really are. Naturally the pleasurable emotions which scoompany the exercise of any of the active powers, and which serve to stimulate to exertion, are always subordinate and subservient, never predominant or importante. In minds of an unbealthy temperament the emotion of pleasure, and the consequent excitement, may be disproportionate to the strength of the faculties; there may be more of commotion than of action, more of movement than of progress, more of enterprise than of achievement; the efficient power of the understanding is thus overborne and left in the the understanding is thus overborne and left in the rear. "Where there is no error of imagination, no misjudging of realities, no calculations which reason condemns, there is no enthusiasm, even though the sould may be on fire with the velocity of its movements in pursuit of its chosen object." "To apply an epithet which carries with it an idea of folly, of weakness, and of extravagence, to a vigorous mind efficiently, as well as ardently, engaged in the pursuit of any substantial and

important object, is not merely to misuse's word, but to introduce contation among our notions, and to put to introduce contation among our notions, and to put to introduce to suit is deserving of respect."—Ref. Matural History of Enthusiasm, by Isane Taylor.

ENTRYMENE, en'the meen (by enthuseme, from en, and thuses, the mind), is a term employed in Riet, introduced by Ariatotie, and which since his time till recently has been almost universally misusderatood. It has generally been defined to be an imperfect ayllogism, having one or other of its premises not appressed, but understood. Though several writers before his time had pointed out the error of this definition. Sir W. Hamilton was the first to call general attention to it, in an article in the Editating Review for April, 1633. This error, he says, "has been believed; believed without any ongent evidence; believed from the most ancient times; and even when the opinion was at last competently refuted, the refutation was itself so completely loggotten, that we do not believe there is at present a logical suthor, not to say in England, but in Europe, who is even aware of the existence of the controversy." De Quincey states, in his essay on Rhetorio, that many years ago, when studying the Aristotelian rhetoric at Orford, he was convined that, by whatever name Aristotle might describe the main purpose of rhetoric, practically, at least, he threw the whole stress upon finding such arguments for any given thesis as, without positively proving of disapproving it, gave it ac colourable support; but how to main purpose of rhetoric, practically, at least, he threw the whole stress upon finding such arguments for any given thesis as, without positively proving or disapproving it, gave it a colourable support; but how to reconcile this with Aristotle's formal account of the office of rhetoric, that it consisted in flading, enthymemes, he could not perceive, till his friend Sir W. Hamilton communicated to him an essay of Faccionatis's (1724), entitled "De Enthymemesta." An enthymeme, then, differs from a syllogiam, not in the accident of suppressing one of its propositions,—either may do this, or neither; the difference is essential, and in the nature of the matter; that of the syllogism being certain and apodeictic, that of the esthymeme probable, and drawn from the province of opinion.

Enromology, ento-mol'-o-je (Gr. enfones, an insect; logos, a discourse), that branch of science which treats of the habits, properties, and organization of insects. The name insect implies an animal insected or divided into segments. This term is applicable to the principal part of the articulate sub-lingdom, and was formerly applied to it; at present,

came to the principal part of the articulate sub-kingdom, and was formerly applied to it; at present the word insect is only used in reference to those articulated animals which are distinguished by anten-me and breathing organs composed of rainfied trachese, with or without air-sacs. The science of entomology presents to the student of nature the most numerous and diversified objects worthy of attention. The observation of the structure and instincts of insects is full of varion of the structure and instincts of insects is init of interest, and has at all times engaged the attention of men of science. Along with other branches of instoral history, the study of entomology was cultivated by Aristotle and other philosophers among the ancient Greeks. Pliny does not add much it his works to the Greeks. Pluy does not add much in his works to the information given by Aristotle, and it was not studied as an absolute science till the 17th century, when progress began to be made. The chief naturalists of that period were Goedart, Swammerdam, Malpighi, Lecuwenhoeck, and Ray. The science, however, was very backward, as Ray estimated the whole number of insect species in the world at 10,000. At the present insect species in the world at 10,000. At the present day, it has been secentained that a larger number than this exists in this country alone. During the 18th century, the great Swedish naturalist Linnaus gave his attention to the study of entomology, and his attention, as far as the orders are concerned, has served as the basis of all that have been since promulserved as the basis of all that have been since promulgated. It is founded on the presence or absence of the wings, their number, consistence, surface, position in repose, and also on the presence or absence of a sting. By this classification, macets were at first divided into seven classification, macets were at first divided into seven classification, adopted in the "Encyclopedia Britannics," is taken from an admirable article by James Wilson, of Woodwille. Bleven different orders of insects are enumerated: 1. Colcopters (Gr. kolcos, a sheath; pieron, a wing), including all those kinds commonly called besties. Their membranous wings, which are the true organs of flight, are protected by a superior and **Entorce** 

anterior per of havilly satisfactors, called slyres. They are all mathematics, and the state of the mathematics of the state of the mathematics of the state of the consistence of present and mathematic of the subject which the state of the consistence of the state of the consistence of the state of the mandatus of the mathematics as the inferior pair. The mandatus and maxilles are replaced by a sheath and suckers. A Neuropters of reservon, more percentage, a warmy, nathoding Bedules or dragon-flee, ephemeras, the Both pass of wings are membranous, naked, and flavorabled with mandables and maxilles—5 Hymenopters of the ware, a membrane; percent, and characterised likewise by membranes of and other suckers of the wise, a neuronal state of wings, and the suckers of the wise of when mandatus, and are not restoulated, as in the preceding order. The mouth is turnished with mandables and maxilles, and the abdomatic of the female is terminated either by an outpostor. ence, coiled elytra, exteriord with ment-plane (Gr. orthas, ling crickets, grade-r wines are of the anterior pair of handle , commit men of the female a terminated either by an ovipositor or a sting.—S Lepidopters (Gr lepis, a scale, pieron, a wing), containing all butterfiles and moths, and generally characterized by the farmaceous or scal, as-nect of the organs of flight, and the tubular or thread-like entension of the parts of the mouth —7 Strepsipters (Gr. strepsis, a turning or twisting, pieron, a wing), including a few peculiar and parasitical species belonging to the genera-Stylops and Zenos —8 Dipters (Gr. sts, twice; pieron, a wing), including the house-length, and other two winged kinds. The mouth is fermished with a proboscis, and there are two organs, called poisers or balancers (halteres), placed behind the true wings, one on each side —9 Suctoria (so designated from their sucking propensities), is constituted by the genus Pulex of Limmeus and difficis from the ensuing apterong orders in undergoing a regular men of the female is terminated either by an ovipositor the ensurary spectrum or himself and districts from the ensurary spectrum orders in undergoing a regular metamorphous, and possessing what some regard us the rediments of elytra.—10 Thysmoura (or the od., I dance; cura, a tail, hisewise an apterious order, including the Peduro and other tribes It evidently derives its name from the springing propersities of its order, which leap by means of a settloria process beat beneath the abdomen —11. Parasits (so named from their perfections of adheave propensities, because they dwell on the bodies of other animals) cont ins the genus Pediculus of Linneaus, and the Norm, or bird-lice (See the articles on the above orders for their parties lar characteristics )

lar characteristics )
Exposed, en-to-so'-d (Gr. entos, within, 2000, an animal), a term applied to those animals which live within others. They are of low organization, and generally expuniform in structure. In most cases the blood is equousless, and circulates, in the higher or gamed species, in a closed system of vessels. They have no inspiratory organs, no articulated members for locomotion, and no organs of sense. In the higher converged attacks. organized culozos, a filamentary nervous system has been recognized Several species of entozon infest the himsp body. (See INTESTIMAL WORLS)

human body. (See Internal Works)

human body. (See Internal Works)

English word of properly signifies a bonded
warehouse, or plees where goods from abroad may be
deposited, and from whence they may again be witdrawn for export without payment of duty. In com
mon language, however, it is employed to designate a
seagory, or sommercial town, through which the importing and exports of a large district pass
England, dww.go?-tereol. (Fr.), in Arch, as a term
borrewed from the French, and used to denote a low
manyielitate story introduced between two lother once
in Faria is a commonly pisced above the first floor
it corresponds to the Italian measureme in its use and
purpose. In heldings in London the entreed, or
measure, is possessible placed immediately above
the grained loose, but its use are portically rea-

Thur.

Party Party in the control of the control of procession of them. He will be controlled procession of them. He will be control of the control person who claimed title to the freehold was taken away, and he could not recover possession against the heir by this summary method, but was driven to his action to gain a legal seism of the cetate. A writ of entry was also a method [of gaining possession of disputed property by trying the title of the occupant, where he had not only a bare possession, which might be destroyed by entry, but also an apparent right of possession. This writ was directed to the sheriff, requiring him to command the tenant of the lead that he render to the demandant the land in question. The possession. This writ was directed to the sheriff, requiring him to command the tenant of the lead that he render to the demandant the land in question. The tenant was thereupon compelled to deliver up the possession of the land, or to show rause for not floing so, and thereupon the possession of the land was awarded to him that could show the clearest right to it. These forms however, were in effect abolished by 3 \$\frac{1}{2}\$ & Will IV c 27, which declares that no person shall be deemed to have been in possession of any land within the meaning of that act merely by reason of having made an entry thereon, and no continual or other claim upon or noar any laid shall preserve any right of making a tentry. The right of entry is now lost by not asserting it? I tently team.

INVELORE MARY OF entrope, on vel-ope (from Fr. sant lapper, to inverse)—Before the introduction of the penny 7 istage, a double charge was levisd on all letters which consisted of two pieces of paper. After the cheap postage was established, the restriction which caused the letters themselves to be sealed or wasfered, was removed. Nearly all letters are now inclosed in an envelope or covering; and as upwards of 500,000,000 of letters pass through the post-offices in this country alone, the manufacture of envelopes is one of no slight importance. The French made sinvences after the restriction and when

in this country alone, the manufacture of envelopes is one of no slight imports see. The French made suvelopes before they were used in England; and when first manufactured in this country, they were made by hand, an expert maker being able to fold three thousand in a day. The general use of envelopes dates from 1840, and several injentious attempts to make them by machinery date from this paried. In the earliest stages of the invention of suvelope-making machines, the paper blanks were cut out and the folding afterwards done by hand; but the pressing necessity of an increase in the power of production led to the extension of mechanical means to the suffice process. A first step towards this result was the suvention of an improved paper-cutting machine for esting out. portiginal atports of a large district pass

Emigrason, daws(g)-bre-sol (Fr.), in Arch, is a term
between from the Freuch, and used to denote a low
interestimate stary introduced between two lotter ones
In Faria is sommonly placed above the first floor
It corresponds to the Italian measuremen its use and
burpose. In beticings in London the chiresol, or
interestima, is consecutably placed immediately above
the grained floor, but for the is not generally rest
the grained floor, but for the is not generally rest
the grained floor, but for the is not generally rest
architecture, in the method; the
Barrer, surface (Fr. chiris, from Lat. surface, I enter),
in Law, is the stating passession of lands and tenuments
Harrer, where (Fr. chiris, from Lat. surface, I enter),
in Law, is the stating passession of lands and tenuments
Harrer, and the free chiric, and fig. 2 a
by the law that the figure of the class of surface of surface of a law to the segment time.

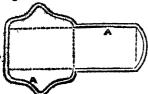
Fig. 1 is a sectional elevation of the fig. and fig. 2 a
by the law the rest of surface of a law to the surface of a law to the surface of the surface o

# Envelope-making

forced through a pile of sheets by mean This shape is not now in to



it serves as an example of some of the attempts which have been made to give additional security with an improvement of appearance and siyle. The cut pieces are gummed on one side at the ends of each flap, and when folded

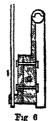


indicated by the dotted hnes in the plan of the cutter, the cutter, the long narrow part adheres to one end of the counterflap, which thus forms the back, and the remaining

Fig 3. pair of flaps fold down upon the former This shape sale of flaps fold down upon the former. This shape of envelope has never come into general use. In 1865 a folding-machine for completing the envelopes was invented by Mesers. Edwin Hill and Warren De la Rue, London It produces about 25 folded envelopes per minute, or in a working day of ten hours, 25,200. The blanks are said by hand upon a table carrying a metal frame, the interior of which exactly corresponds in size and shape to the finished envelope, and immediately over fits is a box or plunger, which, fitting to the interior of the frame, is caused to descend upon the proper blank when laid over it, thus creasing it on all four sides, as will be understood on examining a partiallyblank when lead over it, thus creasing it on all four ades, as will be understood on examining a partially-opened envelope the box then opens to admit of a partial folding. In this condition the blank has been simply creased, and the four flaps stand up at right singles to the plane of the sheet. Before the creasing-box is entirely raised, two of a set of folders, placed one can each of the four sides of the frame, come for-ward, and meas down the two flars corresponding to ward, and press down the two flaps corresponding to their elitation, and the remaining two folders come into action to press their two fisps after the other por-tion of the plunger is raised These movements comtion of the plunger is raised. These movements complete the envelope by turning down the right angle lage to the plane of the sheet, and the next step is to sensore them from the folding-frame. For this purpose two finger-shaped projections of caoutchouc are made use of; and, owing to the strong adhesion existing between this substance and paper, the folded envelopes are quickly removed as fast as they are produced. The twenty-two movements required in folding-each envelope are performed rapidly and noiselessly, principally by various adaptations of cams. Prior Messes, Mill and De la Rue e invention, the only facilitation of manual labour in folding was obtained by the use of a species of tool which partially creased the mesers, him and he is true a invention, the only facilitation of manual abour in folding was obtained by the use of a species of tool which partially creased the blanks, leaving them to be durined up and finshed by band. Compared with "the results of machinery," the hand labour, although in itself an astoniahing instance of practical dexterity, is inordinately slow. Cirls are always employed in this work, and a first-rate hand can field and gum for use from 3,000 to 3,500 per slay, or from 5 to 6 per minute, the average personnesses being from 2,500 to 3,000. To serve as this particular size or eight munths' practice is required. By sinchar comparative statement we find that in unstanged diveleges, hand labour, 6 per munte, 10 hours per slay = 3,500, the work of one girl. Stamped envelopes, hand labour, 45 per minute, 10 hours per slay = 2,500, a sing's work; the time being divided into 7 hours for folding and gumming, and 3 for stamping. On Plates Li, and Lill, and in the secondarying figures, very full details use given of an improved folding-insolute patentics in the year 1853, by 3L. Bémend.

# Envelope-making

In this machine come my dweed, wherehy strangpher In this machine some unusum appliances are introduced, whether simple pressure is amployed to facility simple the beating an of the blanks to the folding apparatus and the secondary folding ention of the flex in connection with the creating plunger. Flate LL shows a corresponding riew at right angles to Plate LL; \$8,2 Plate LLI, is a vertical section of a portion of the machinery taken at the dotted has a Flate LL; \$8,2 Plate LLI, is a vertical section of a portion of the machinery taken at the dotted has a Flate LLI, \$8,2 Plate LLI, is a torizontal view or plan of the finding-table, with the details of the apparatus for receiving the blacks preparatory to folding, \$6,2 Plate LLI, is a transverse section taken at the dotted line CD in Plate LLI, \$6, Plate LLI, as a figure \$6,7, and \$6 are details of the guide apparatus for this apparatus for the second for the seco mione applianças are intro-





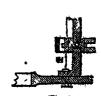


Fig. 7. Pie 8.

Fig 6. Fig. 7. Fig 8. movements on the man shaft (A) of the machine. The arrangement of the mechanism is such that a quantity of blanks of the required size being placed on the feeding-table, each will be taken up singly from the pile and fed into the feeding apparashs by means of an instrument, in which, at proper intervals, a partial vacuum is formed, whereby each sheet is sucked up against the surface of the fingers for conveyance to the folder. The first step of the process of folding is accomplished annilarly to the mode hitherto adopted and generally explained in reference to Mesers De is Rue's machine; that is, the flags of the blanks are bent to a right angle by the same means; but a novel arrangement is introduced for the performance of the secondary fold. The hottom of the creasing-frame, or box, is perforated as that the passing back of the plunger leaves the blank within the recess with its four flags standing upright; and here the second application of the standards. and here the second application of the samesh action comes into play for the purpose of giving flaps a preparatory inclination inwards, in ords and here the second application of the samespassic solution comes into play for the purpose of giving the flaps a preparatory inclination inwards, in order to fit them for receiving the flat folding pressure of the return stroke of the plunger. To this end the index of the folding-box are perforated so as to allow streams of air to be forced against the outside of the flaps, so that on the descent of the plunger they will be folded down at ones, the interior and under side of the plunger being so formed as to cause the flaps to succeed each other in proper order. In addition to this, certain contrivances are adapted for examping the outer flaps with an emboused or performed design, and also for gumming the lowest flap as a fastening for the finished envelope. A is the main driving-shaft, whol gives motion to the machine. It carries at one end a fast-and-loose driving pulley, and at the other a fir-wheel, to assist in regulating the movement; and its intermediate portion is fitted with seven came, for communicating motion to the different working parts B is the folding-loc, or receive, in which the folding process is performed. It consists of four side-pieces, at the angles of which are projections (C O ), between which the blanks are successively fed, so that they may be correctly placed and held disting the action of the plunger. D is the door or movelable bottom of the box, hinged at one end, so that first and the proper time of the country of the came of the man of the love of the plunger. But he had it may be discharged below. It is perforated with numerical levies, for the escape of air, as the hank is forced down, and a kept disclosed by means of a lever [3], which is activated at the proper intervals of time by these of the same flat as the program of the same flat, gring motion to a side-fif.

## Envelope-making

connection with the same number of came. The slide works between two fixed guiding surfaces (H H), as detailed in figs. 6 and 7, and has at its upper and a small antifriction roller, kept my in cointact with its actuating cam by the elastic tension of 8 hand of valcanized india-rubber. The lower end of the slide preases on the end of the sranked lever H, the other and of which rests against the under surface of the movable door D, so that the latter is kept closed during the proper position of the revolution of the main shaft. The feeding action is accomplished by the exterior cam (K) on the shaft giving motion (as before explained with regard to the cam F) to its slide L, which is attached to the aborter end of the cranked lever M, the opposite arm of which is jointed by connecting rods to the feeder N. This instrument is carried upon a slide having dovetailed edges, moving between fixed guiding dovetaile at O.O. It consists of two hollow flugars (P, P), each having an opening on the under side; the interior of the flugars opening into the healter position of the slide (shown by detailed). on the under side; the interior of the fingers opening into the hollow portion of the slide (shown by dotted into the hollow portion of the slide (shown by dotted lines), allowing of a partial recumn being obtained within the fingers when the exhaust movement comes into use. A flexible tube (Q) of valcanized indiarribher is attached to the under side of the slide, the opposite end being connected with the bellows (R), which receive motion at the required intervals from the cam S acting on the slide T, in connection with the best lever U, carried by a pillar at the back of the machine. The longer end of this lever is jointed by a connecting-rod (V) to the front plate (W) of the horizontal bellows, running on gride solubles (X, X). horisontal bellows, running on guide spindles (X, X). In this way, when the under side of the fingers comes In this way, when the under side of the ingers comes upon the top of the pile of blanks at Y, the orhausing action is brought into play, and the top sheet is carried over to the top of the box B for deposit, with tas angles fitting the corner guide-pieces, us in plan at fig. 3, Plate LILL. At the termination of the outward stroke of the bellows, the sheet is separated from them by the action of a valve in the bellows, opening outby the action of a valve in the bellows, opening out-wards at the commencement of the return stroke. The platform (Y) carrying the pile of blanks is made to rise and fall to suit the feeding action by a mechanical cal arrangement, worked from the cam Z. This cam-actuates a slide (a), from which an arm (b) descends for connection with the long lever (c) at the bottom of the framing, the opposite end of which is jointed to a projection on the vertical spindle (d) of the platform. To compensate for the continual decrease in the height of the pile of blanks, so that the upper one may always come in contact with the lifting-fingers when the platform rises, an india-rubber spring (e) is added, its action being to keep up the platform in contact with the fingers, when permitted to do so by the actuating cam. As everything depends upon accuracy of set, it becomes of the first importance to place the blanks in the exact position intended; and, to facilitate this, four projecting arms, or guides (f, f), are formed on the top of the platform, agreeing, as in the angle-pieces of the folding-box, with the angles of the flat blanks. As the blanks are fed into proper position, the folding-plunger (g) comes into action. This is a the platform rises, an india-rubber spring (e) is added. the folding-plunger (g) comes into action. This is a hollow rectangular metallic frame, carried by a slide the folding-planger (g) comes into action. This is a hollow rectangular metallic frame, carried by a slide (h) receiving motion from the cam R. It has in its interior a set of three projections, which, in the accordary motement, act on the separate flaps, folding them all down at once, when they are held in the required inclined position by the atmospheric side-currents, as previously explained. The inclined projections are essentially necessary in order that the laps may be folded down in their proper relative positions. The projection is pressing upon one of the side-shape accuses it to be folded first; afterwards, the projections makes upon one of the ends, whilst the third (s) carries stown the opposite one, the final folding ledge completed by the moder edges of the plunger, which gives a sharp pressure to the initiatory fold of the whole series. By suitably setting these projections, any order may be given to the flaps; thus, if the two end once do not overlay seal of there, they may be folded down together by equal projections. The detailed figures (8 and 18) substitute the intermediate stages of the plunger's folding section. Fig. 9 is a longitudinal covertion of the splunger and the pool of the folding-box in the position taken up after the first action of

# Envy

the former, the side air-passages for inclosing the disps being at 0, 0, 0. Fig. 10 is a longitudinal section of the same parts, taken just as the plunger is about

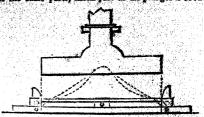


Fig. 9.

to descend in its secondary movement to give the completing fold. The necessary atmospheric side-pressure on the flaps is obtained from the inclined air-

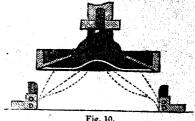


Fig. 10.

pump (p), the piston of which is driven by a crank-pin on the fly-wheel; and a tube (q) conveys the fonced are from the bottom of the pump to a hollow channel passing all round the edges of the folding-box, as dotted in the plan, fig. 3, Plate LII., whence the crifices already pointed out open inwards to the box. For the application of gum or other cementing fluid to the lowest flap, to secure the three extationary ones, a fountain is placed at r, from the bottom of whigh two twees (S, S) branch out to the two flat twollar receptacles (t, t) inclosed in a vessel (u), the supply being regulated by a stopcock before the junction of the two supply branches. The gumming action is performed by pieces of sponge placed in the upper ends of the flat tubes (s), which, standing slightly above their upper edges, the presser the edges of the lowest flap upon the plunger, presses the edges of the lowest flap upon the sponge, as clearly illustrated in the plan riew. This presser receives its motion from the came wasting on the slide x, to which the presser is attached. If it is intended to stamp or emboas the outer flap, dies are applied at y and x. The die (y) being attached to a slide (1), acted an by an external cam (2), the stamping action takes place just before the descent of the plunger. This machine produces easily 60 envelopes per minute, or 36,000 a day, completed, gummed and stamped. As at present practiced, in their modes of production, these three processes are distinct and separate, each one requiring a different handling. Thus M. Rémond's machine saves more than one-third of manual labour. The separation of the stages of the escond rank, being intenior to an ambassador. In already pointed out open inwards to the box. For the application of gum or other cementing fluid to the

the cost of production, mainly in the removals.

E \*\*vor, en'-voi (Fr. encoye), a diplomatic agent of
the second rank, being inferior to an ambassador. In
common with ambassadors, they are accredited direct
from one sovereign to another; but they differ from
the latter in not representing the personal dignity of
their sovereign, but only his affairs. They are either
ordinary or extraordinary. (See Rangasz, Amassanor, Diplomatr.)

ordinary or extraordinary. Low camesas, camesas-nor, Diplomacy.)

Envy, ov-ce (Fr. envier), in Bithies, is defined by Looke to be an uncerings of mind, operationed by the consideration of a good we discover in the persession of another person, whom we design less worthy of it than ourselves. It is characterized by a degree of

sorrow that the good contemplated should escape ourselves, and of anger that it should fall to the share of another. It differs from emulation, which is merely a desire to become possessed of something which is enjoyed by another; whereas, in enry, there is a malevolent feeling which desires that others be brought down below our own level. Though the difference between emulation and enry is thus marked, through the natural weakness of our nature it is attacked. Efficient to present the former wholly and extremely difficult to preserve the former wholly un-mixed with the latter. "Pure envy," says Dr. Reid, "is the most malignant passion that can lodge in the breast, which devours, as its natural food, the fame and the happiness of those who are most deserving of our estcem.

our estem."

EOCENE, &'-o-sene (Gr. sos, the dawn; kainos, recent), in Geol., a term introduced by Lyell to designate the lower tertiary strate, from the idea that the very small per-centage of still existing species among the fossils of these strate indicates what may be regarded as the dawn or commencement of the present condition of Creation. (See Tertiary System.)
EOLIAN HARP. (See ÆOLIAN HARP.)

EFACHIDACEE, ep. a. krid ai se-e (Gr. epi, upon; akros, the top), in Bot., the Epacris fam., a uat. ord. of dicotyledonous plants in the sub-class Corollifora. The dieotyleaconous plants in the sub-class corouspiors. The species are shrubs or small trees, natives of Australia, the Indian archipelago, and the South-Sea islands, where they are very numerous. There are 31 genera, and about 320 species. They are of little importance, except for the beauty of their flowers, on which account them can make subtracted. The familia of more are additionally approximated. they are much cultivated. The fruits of many are edi-ble; as those of Astroloma humifusum, the Tasmanian eranberry, and Leucopogon Richei, the native current of Australia.

EPACT, e'-pakt (Gr. epaktos, additional), the name given to the moon's age at the close of the year. The epact of the fictitious or ecclesiastical moon, by which Easter is regulated, is given in the table of movable feasts appended to the calendar in the Book of Com-

mon Prayer.

EPAULEMENT, e - pawl' - ment (from Fr. épaule, shoulder), the name given to a species of low para pet without a banquette at its foot in the interior which is thrown up as a means of protection, and used in the construction of field-works. The expression is in the construction of held-works. The expression is often applied to a parapet of the usual height, regularly fermed, with a banquette, and may be almost considered synonymous with the term parapet. It is, however, more properly employed to designate a mound of earth, about seven or eight feet high, thrown up on either side of a battery, towards the rear, in a direction at right angles to the face, to protect the guns and more term as a rediction for the control of the seven considering the control of the seven as a rediction for t

and men from an enfolding fire.

ERAULETE, ep'-o-let (Fr.), an ornamental badge worn upon the shoulder by military and naval officers and men in the English and continental services. These distinguishing marks vary in shape and richness ne-cording to the rank of the wearer. A few years ago the epaulette was abolished in the English army, the sash being substituted for it.

EPHRMINA, e-fem-e-ri (Gr. cpi, ong emera, a day), a gen. of neuropterous insects, helonging to the fam. of Subulicornes of Latreille. They have long, soft, tapering bodies, terminating in two or three long acte. Their wings are placed nearly, or quite, perpendicu-larly; their antennæ are three-pointed, and very small, In the larva state they live in wet places, or under water, and enjoy an existence of two or three years; but when they attain their final stage of metamorphosis and perfect form, they are among the most fleeting of living creatures, existing often only a few hours, and propagating their species before they die. In this state they sometimes appear suddenly in myriads during time summer evenings by the water-side, when they may be seen flitting about, and belancing themselves in the air, in the manner of gadflies.

EPHESIANS, EPISTIE OF PAUL TO THE, of e' châus, is the fifth in numerical order of the fourteen epistles

the Ephesians," in a few of the ancient MSS., and the assertion of Marcion, a herefu of the second century, but whose testimony is of no weight, that it was addressed to the Laodiceans. Others, again, regard it as a cyclical epistle addressed to no particular church, but to all, though Ephesus may have been the chief. Though the testimony against the received opinion were much stronger than it really is, it is not a matter of great importance; for what was addressed to one was intended for all. It is generally believed to have been written about the year 81 A.D., during the early part of the apostle's first imprisonment at Rome. "He was appre-ensive lest advantage should be taken of his confinement to unactile the minde of Ephesian of his confinement to unsettle the minds of Ephesian converts, who were almost wholly gentiles. Hearing, however, that they stood firm in the faith of Christ, he wrote this epistle in order to establish them in that faith, and to give them more exacted views of the love of God and of the excellency and dignity of Christ; and at thesame time to fortify their minds sgainst the scandal at the same time to fortify their minds against the scandal of the cross. With this view, he shows them that they were saved by grace; and that, however, wretched they once were, now they had equal privileges with the Jews. He then proceeds to encourage them to persevere in their Christian calling, by declaring with what steadfastness he suffered for the truth, and with what steadfastness he prayed for their establishment and continuance in it; and urges them to walk in a manner becoming their profession, in the faithful discharge both of the general and common duties of religion and of the special duties of particular relations." The style of this epistle is exceedingly animated, and corresponds with the state of the apostle's mind at the time of this epistle is exceedingly animated, and corresponds with the state of the apostle's mind at the time of writing. Overjoyed with the account brought him of their faith and holiness, and transported with exalted views of God's love and goodness, more especially in conferring the benefits of Christ's death upon the gentiles, his thoughts soar high, and tind utterance in sublime and copious expressions.—Ref. Horne's Introduction to the Sacred Scriptures.

Expressions.—Ref. Horne's the

Introduction to the Sacred Scriptures.

ETHPHEGUS, e-pi-fe'-gus (Gr. epi, upon; phegos, the beech), a gen. of plants parasitical upon the beech-tree.

ETHOD, ef'-od (Heb., a covering), among the ancient Jews, was one of the essential articles of the priest's official dress. It was an upper garment consisting of two pieces, one covering the back and the other the breast, and being united upon the two shoulders. It was made of plain linen, except that of the high priest, which was embroidered with various colours. Properly, according to the law of Mosses, the ephod was to be worn only by the high priest; but it subsequently came to be in common use among the oriesthood, and to be worn only by the high priest; but it subsequently came to be in common use among the priesthood, and even David, when bringing the ark back to Jerusalem, appeared in one. The ephod was regarded by the Jews as a sacred object, and sometimes received divine homage. A description of the ephod of the high priest is given in Exodus xvviii. 6, et seq.

EPROSI, of 'o-ri (Gr. ephoroi, overseers), magistrates who were common to many Dorian constitutions in auction of anything to Lorange which arise the least the control of the latest the expense which arise to search the services are the services as the service of the control of the least the services are the services as the services are the services are the services as the services are the servic

tion of ephori to Lycurgus, while Aristotle ascribes it to Theopompus, who lived about 770 B.C. Both these to Theopompus, who lived about 770 s.c. Both these accounts, however, seem to be incorrect, the real origin of the ephori being lost, through historical inaccuracy and varieties of opinion. The duties of the ephori consisted in the management of the internal administrations of the state, especially matters of justice; and a particular building, called the Ephorion, was allotted to them. The number of the ephori was five; they were elected from and by the people, and held their offices for one year. Those who had votes in the election were not restricted by age or property, so and the election was not not under any scrutiny; so in the election were not restricted by age or property, and the election was not put under any scrutiny; so that, as Aristotle observes, in the institution of the ephori, the people participated in the highest magistracy of the state. In later times, the powers of the ephori were greatly increased. They had the privilege of instituting scrutinies into the conduct of all the magistrates, and are the hings could be branched. is the fifth in numerical order of the fourteen epistles of St. Paul contained in the canon of the New Testament. The principal fathers of the early Church are numerical manimous in favour of the genuineness and canonicity under their authority, and it could not be said when the could not interfere. At last, quently been carried on as to whether it was addressed in 255 s.c., the ephori for the time being were murto the Ephesians, from the omission of the words "to dered by Agis and Cleomenes, and the office abolished."

## Epicalyx

The ephori were, however, again restored to power

under the Komans.

EFICALYX, ept-e-kai-like, in Bot., the term applied by many botamist to a circle of bracts appearing immediately below the calyx or outer covering of the flower. It is seen in the mallow tibe, and in many plants of the pink and rose tribes. Though a distinct same has been given to this whorl of leafy organs, it properly comes under the denomination of involuers (which see). (which see).

(which see).

EPICARP, ep'-s-karp (Gr. epi, upon; karpos, fruit), in Bot., the external layer or region of the pericarp or shell of a fruit. This layer generally appears as a thin skin, being far less liable to alteration than either mesocarp or endocarp. (See FRUIT.)

EPIC PORTEN, ep'-ik (Gr. epos, a discourse or narrative), is a kind of poetry which has outward objects for its subjects, and is thus distinguished from lyric poetry, which deals with the inner feelings and emotions of the mind. The distinction is general; for there are few norductions to which it can strictly apply; but are few productions to which it can strictly apply; but they belong to the one class or the other, according to the predominating character. As in the individual man, so with the human race, the mind is objective before it is subjective; it observes external objects before it turns its thoughts in upon itself; and hence we may conclude that the epic was the earliest species of poetry. The earliest specimens of this form of art probably consisted of simple tales rhythmically arranged, and recited to a very simple musical accom-paniment. The longer and more artistic epic poems, however, embrace an extensive series of events and however, embrace an extensive series of events and the actions of numerous personages. The epic poetry of the early Greeks naturally divides itself into two classes,—the heroic or romantic epos of Homer, and the hieratic epos of Hesiod, the one dealing with the political, the other with the religious, life of the Greeks. The "Hiad" and "Odyssey" of Homer present us with the finest specimens of this class of poetry that have ever appeared. The sacred poetry of Hesiod partakes very much of a lyrical character. The "Æneid" of Virgil is not equal to the "Iliad" of The "Encid" of Virgil is not equal to the "Iliad" of Homer as an epic; its superiority depending more on beauty of language and arrangement than on anything in the story. The greatest epic of modern times is the "Paradise Lost" of Milton. Dante's "Divine Comedy," however sublime in style, is destitute of that unity of event or action necessary to constitute a great work of this class. The "Jerusalem Delivered" of Tasso is regularly and strictly an epic, and adorned with all the beauties that belong to this species of composition. The epic poem is of all poetical works the most dignified, and at the same time the most difficult in execution; and hence it is that so very few the most dignified, and at the same time the most difficult in execution; and hence it is that so very few have succeeded in the attempt to produce a really great epic. "To contrive a story which shall please and interest all readers, by being at once entertaining, important, and instructive; to fill it with suitable incients; to enliven it with a variety of characters, and of descriptions; and throughout a long work to maintain that propriety of sentiment and that elevation of style, which the epic character requires, is unquestionably the highest effort of poetical genius."—(Blair's Ratorio.) It requires, more than any other species any one nigness enors or poetical genua."—[Blair's Rhetoric.) It requires, more than any other species of poetry, a grave, equal, and supported dignity. The action, or subject, must have three properties: it must be one; it must be great; and it must be interesting. Scattered and independent facts can never affect a reader as deady was accomplished. esting. Described and independent acres as a strongly, as a tale that is one and connected, where the several incidents hang upon one another, and are all made to conspire for the accomplishment of one end. Such episodes or subordinate actions as are introduced should be brought in naturally, and have sufficient connection with the principal subject; they ought to be elegant and well-finished, and present us with objects of a different kind from those that go before objects of a different kind from those that go before or follow after. Epic poetry has often been compared to the drama; and the essential difference between the two is, that the province of the former is description; of the latter, action. The smotions which epic poetry excites are not so frequent and violent as those produced by dramatic composition, but they are more prolonged and more developed by actual occurrences; for an epic poem embraces a widst compass of time

# Epidermal Appendages

and action than is admissible in the drama. Epic poetry "is the region within which we look for everything that is sublime in description, tender in sentiating that is sublime in description, tender in sentiating that is

thing that is submitted in expression;" and "all the objects which it presents ought to be either great, or tender, or pleasing."—(Blair.)

EFICUREATION, ep-s-ku-re'-da-icm, a term applied to the system of philosophy adopted and promulgated by Epicurus, who lived from B.C. 337 to B.C. 270. In its character assume that the system of philosophy adopted the universe, who lived from B.C. 337 to B.C. 270. expectures, who lived from B.C. 337 to B.C. 270. In its physical system encureanism considered the universe, consisting of matter and space, to be infinite and eternal, while the various bodies of which it is composed are subject to decay and change. "Nothing can spring from nothing, nor can anything return to nothing," was one of the favourite maxima of the school. The science of the statement of the statement of the school. nothing," was one of the favourite maxime of the school. The science of physics was, however, in the opinion of Epicurus, subordinate to that of ethics. According to his authority, the great end of man is his own happiness, which is to be obtained by the subjugation of his passions and the moderation of his desires. His followers entering farther into the spirit and natural tendency of his system, resolved all hap-piness into the gratification of the senses. The sys-tem was consequently adopted readily by the idle, the luxurious, and the vicious. At the present day epicu-reanism in its physical system is synonymous with the doctrine of chance, and in its moral system with selfishness.

EPIDEMIC, ep-s-dem'-ik (Gr., from epi, upon, and demos, the people), in Med., is a general term applied to diseases which provail among a large portion of the to diseases which provail among a large portion of the people of a country or place for a certain time, and then gradually disappear. The causes assigned for the prevalence of epidemic diseases are very various, and are by no means determined. The most generally assigned causes are a peculiar state of the atmosphere or climate, the seasons, &c. Defective ventilation or drainage, and unwholesome food or drink, are also among the causes that induce epidemics. Most epidemic diseases are likewise contagious, and thus, when once induced, spread with great rapidity. During the prevalence of an epidemic, it is proper to take particular care of the health, as the best means of resisting

its influence

its influence.

RPIDEMALAPPENDAGES, ep-e-der'-mal ap-pen'-dāj-es
(Gr. epidermis, the cuticle; Lat. appendo, I hang or
attach to), in Bot., the general term for certain structures, consisting of cells, variously combined, found
upon the surface of the epidermis, or in the subepidermal tissue. They may be divided into hairs and
glands. The former are thread-like elongations, externally, of the epidermal cells, covered by cuticle.
When a hair is formed of a single cell, it is said to be
simple; and when composed of several cells, compound. hairs appear under a variety of forms: thus they may be undivided, branched, or forked; star-shaped, or stell-ste; necklace-shaped, or moniliform; club-shaped, stellate; necklace-shaped, or montifform; club-shaped, or clavate; shield-like, or peltate. They-sometines are found terminating in a hook on one side pointing downwards, when they are said to be uncinate; and sometimes they present two or more hooks at their aper, when they are said to be glochidiats, or barbed. When the divisions of a stellate hair are closely connected, a scale or scurf is formed. When hairs are composed of cells which are short, and have their sides thickened by secondary denomina as that they form composed of cells which are short, and have their sides thickened by secondary deposits, so that they form stiffened processes, they are then called seta, or bristles. These, slightly modified, form prickles, which are defined as large hardened processes, terminating in a sharp point, and springing from the epidermis, or the bark of plants. They are especially abundant on the stems of the rose and bramble. Hairs occur upon various parts of plants, and, according to their abundance and nature, give varying appearances to them, which and nature, give varying appearances to them, which are distinguished in practical botany by special names. The more common position of hairs is upon the leaves and stems; but they also occur on the parts of the flower, the fruit, and the seed. The substance called cowage, or cowrich, is the hair covering the legumes of Mucuna pruviens, while cotton is simply the hair covering the seeds of various species of Gosspius. covering the seems of various species of Consystems. Glands, properly so called, are cells which secrete a peculiar matter; but with them botanists generally associate other superficial appendages. The sting of the nettle, the little receptacles in the rind of the

# Epidermal Tissue

orange, and the necturies at the base of the coloured leaves of the buttercup and crown imperial, are familiar examples of glands. When glands are situated below the epidermis, and surrounded by a compact layer of cells, they are said to be internal. These are common in such plants as rue, mint, majoram, and thyme; and it is to the presence of the scoretions they contain that the plants owe their value as articles of comestic economy or medicinal agents.

EPIDERMAL TISSUE, in Bot., the termed applied to the external layer of cells in flowering and the higher flowerless plants. This layer may commonly be readily separated as a distinct membrane or skin, as its component cells differ in shape and in the nature of their contents from those cells placed beneath them. This tissue consists of two parts; namely, of an inner portion, usually called the *epidermis*, and of an outer thin pellicle, to which the name outicle is given. Carpenter, and some other authors, make use of these terms in and some other authors, make use of these terms in precisely the reverse sense, calling the external pelli-cle the epidermis. We, following Professor Bentley, will employ the terms as generally understood. The epidermis, then, consists of one or more layers of cells, epidermis, then, consists of one or more layers of cells, firmly united together by their sides so as to form a membrane. These cells are generally of a flattened tabular character; but they vary much in their outline. Ordinarily, in European plants, the epidermis is formed of but one row of cells; but in tropical plants, two, three, or more rows are common. The upper walls of the cells are generally much thickened by secondary deposits, and this thickening is especially avident in leaves of a leathery or hardened texture. evident in leaves of a leathery or hardened texture, as those of the cleander, box, and holly. The epidermis covers all parts of the plants upon which it is found that are exposed directly to the air, except the stigma; and it is in all cases absent from those which live under water. In the fungi, algae, and lichens, it is altogether wanting. The cuticle covers the entire is altogether wanting. The cuttele covers the entire surface of the epidermal cells, with the exception of the openings called stomata, and even sheathes the hairs and other appendages. It has no cellular structure, but is a perfectly homogeneous membrane. A membranous layer, resembling, if not actually identical with cuticle, is found upon the surface of plants living under water, and also covering the algae, lichous, and fungi. The stomata, or stomates, to which allusion has been made, are oritices situated between some of the been made, are orifices situated between some of the epidermal cells leading into the intercellular cavities beneath, so as to allow a free communication between the internal tissues and the external air. They are commonly called breathing-pores. They vary in form and position in different plants and different parts of and position in different plants and different parts of the same plant; but they are always the same in any particular part of a plant. The most common form is oval, but they are sometimes seen round or square. They are either placed singly upon the epidermis at regular or irregular distances, or in clusters, with spaces quite free from them intervening. The number of stomata also varies considerably in different plants and different parts of the same plant. We give the numbers counted in a square inch upon the upper and under surfaces of the leaves of a few plants, to show the extent of this variation:—Mislatore, upper surface under surfaces of the leaves of a few plants, to show the extent of this variation:—Mistletoe, upper surface 200, under surface 200; prony, upper surface none, lower surface 13,710; house-leek, upper surface 10,710, lower surface 6,000; liliac, upper surface none, lower surface 160,000. Stomata exist more or less upon all flowering plants, but are absent from the lower orders of flowerless plants. On floating leaves they are only found on the upper surface.

EPIDERMIS. (See SEIN.)

EPIDERMIS, in Bot. (See EPIDERMAL TISSUE.)

EPIGEOTTIS, ep-e-glot'-tis (Gr. epi, upon, and glotta, the tongue), in Anat., is the cartilage at the root of the tongue that falls upon the glottis, or superior opening of the larynz. In figure, it is somewhat oval, rather of the larynx. In ngure, it is somewhat oval, rather convex above and concave below, and covered by mucous membrane. It adheres inferiorly to the interior part of the thyroid cartilage by a strong elastic membrane. Its apex is loose, and always elevated upwards by its own elasticity. When the back of the tongue is drawn backwards in swallowing,

the epiglottis is put over the aperture of the larynz, and thus shuts up the passage from the mouth into

the larynx.

# Epilepsy

EFIGRAM, ep'-e-grām (Gr. epigramma, an inscription), a term originally applied, as shown by its derivation, to the inscriptions on the tombs and monuments of the ancient Greeks. They were generally written in verse, and showed great simplicity of style. Usually they were either dedicatory, descriptive, amatory, or elegiac. They were seldom humorous; and their chief marrit consisted in the justness of a single thought conenergiac. They were season numerous; and their ones merit consisted in the justness of a single thought conveyed in harmonious language. The nucient Romans, in their acceptation of the term epigram, seem to approach nearer to the idea of modern epigram. Catullus proach nearer to the idea of modern epigram. Catulus and Martial were amongst their most famous epigrammatists. In modern times an epigram is considered to be a short poem usually consisting of two to eight lines, in which some striking or ingenious thought is expressed; whether it be serious or humorous is a matter of indifference. The French have always could in the literature of the french have always excelled in this kind of writing. The Germans have usually combined moral proverbs with their epigrams; but those of Schiller and Goethe are generally satirical. Pope, Byron, Burns, and Moore, in this country, have written epigrammatic satire with the greatest success. The following lines, written by Voltaire, under a statue of Cupid in his garden, may serve as a specimen of the modern epigram :-

> Qui que tu sois, voilà ton maître,-Il l'est, le fut, on le doit être." Whoe'er thou art, thy master see,-He is, or was, or is to be.

He is, or was, or is to be.

EFIGXNOUS, e-pij'-e-nus (Gr. epi, upon; gune, female), in Bot., a term applied to the stamens and corolls when they appear to arise from the summit of the ovary, in consequence of the adherence of the calvax to that organ. Examples may be seen in the campaunia, carrot, and ivy. The name Epigona has been given to a subdivision of the Calycilvar, and also to a subdivision of the Carollifora, from the calva being more or less adherent, and the ovary consequently inferior. (See classification in article BOTANX.)

EPILEPSY, ep'-e-lep-se (Gr. epitepsis, from epi, and lambano, I seize), in Med., is a form of disease which receives its name from the suddenness of its attack. It is also called the falling sickness, from the patient.

It is also called the falling sickness, from the patient, if standing, suddenly falling to the ground. By the ancients it was called the sacred disease, from being supposed to be due to the influence of the gods or evil supposed to be due to the influence of the gods or evil spirits. The attack is usually sudden, without any warning. The patient may be in his ordinary health, engaged, perhaps, in his usual occupation, when all at once he utters a pieroing scream, and falls to the ground. Immediately thereafter the face becomes violently distorted, the head is usually drawn to one side, the eyes are set and staring, or roll wildly about, the colour of the skin becomes dark and livid, and the rains awallan and thereid there is frothing at the veins swollen and turgid; there is frothing at the mouth; the muscles of the lower jaw act violently, producing gnashing of teeth, and frequently the tongue is thereby grievously injured; the arms are sometimes thrown violently about, and the lower limbs may be thrown violently about, and the lower limbs may be agitated in a similar manuer, while the fingers with great power clutch at whatever comes in their way. The breathing is at first heavy and difficult, but afterwards it becomes short, quick, and stertorious, and is often accompanied with signing and meaning. One side of the bedy a numeral of the state of of the body is commonly more agitated than another. of the body is commonly more agitated than another. After a longer or shorter period, the convulsive movements gradually diminish, and the patient seems to recover a faint glimmering of consciousness; but the look which he casts around is stupid and heavy, and he goes off into a lethargic sleep, from which he does not awake for some hours. Commonly there is no consciousness of anything that occurred during the paroxysm. On conjugate the fit there is generally paroxysm. On coming out of the fit, there is generally headache, and always languor, and it may be days before he fully recovers from the effects of the attack. before he fully recovers from the effects of the attack. The duration of the paroxysm is usually from five to ten minutes; but sometimes several attacks follow each other, and it may be protracted for several hours. This is a severe form of epilepsy; but frequently it is less severe, consisting merely of loss of consciousness, slight rigidity, and the convulsion of a few muscles, and lasting only for a minute or two. Occasionally death takes also a device the processor in the convulsity is a standard. place during the paroxyam; but generally it is attended with little danger unless the patient may injure himself

by falling in some dangerous position. During the attack, the principal thing is to see that the patient do not injure himself,—especially, a piece of cork or other gag ought to be placed between his teeth, to prevent injury to the tongue: the dress should be loosened about the neck and chest; the head, if possible, a little raised, and a free circulation of air maintained. The return of the fit is exceedingly surjoined. tained. The return of the fit is exceedingly various in different individuals; several years, in some cases, intervening between the attacks, while in others they may occur every month, week, or day. When neglected, they usually become more and more severe, or recur at shorter intervals. Repeated attacks of this disease, in general, soon produce a marked change in the mental and physical character of the individual. There is a gradual diminution of the active powers, purpose begradual dumination of the active powers, purpose becomes irresolute, the spirits are depressed, and the memory fails; the features become coarse, heavy, and inexpressive, and the look vacant. The most frequent, perhaps, of the consequences of confirmed epilepsy is insanity, either in the form of acute mania or monomania following the attacks, or of gradual imbedility, without any acute seizure. Though the fit, as we have without any acute seizure. Though the fit, as we have said, usually comes on suddenly, yet there is sometimes distinct warning of its approach. These vary in dif-ferent individuals, and may be lowness of spirits, irrirerent mutvialus, and may be lowness of spirits, irritability, dizziness, noises in the car, floating specks before the eyes. There is, however, a particular sensation which is said to be felt by some immediately before the attack, and which is known as the aura epileptica. It is variously described as resembling a current of air, a stream of water, or a slight convulsive tremor, commencing in one of the limbs, and proceed ing upwards to the head, when the patient is deprived of all consciousness. Epilepsy is commonly divided into idiopathic, when it is a primary disease, depending on some affection of the brain, and sympathetic, when on some affection of the brain, and sympathetic, when produced by an affection in some other part of the body,—as the stomach, bowels, liver, circulating system, &c. Among the causes which give rise to epilepsy are external injuries done to the brain by blows, wounds, fractures, and the like, or internal injuries by water in the brain, tumours, concretions, and polypi. Violent affections of the nervous system, sudden frights, strong mental emotious, acute pains in any part, worms in the stomach or intestines, teething, suppression of accustomed exacustions &c. are causes suppression of accustomed evacuations, &c., are causes which also produce epilepsy. Sometimes it is hereditary, at other times it arises from a predisposition occasioned either by plethora or a state of debility. When it arises from hereditary predisposition, or comes When it arises from hereditary predisposition, or comes on after the age of puberty, or when the attacks are frequent and of long duration, it is usually difficult to effect a cure; but occurring in early life, and occasioned by worms or any other accidental cause, it may, in general, be remedied with ease. Where the disease can be traced to any special exciting cause,—as injuries of the head, worms, teething, &c., the treatment should be first directed to its removal. Where, as is often the case, a plethonic attacks means to occasion the disease. the case, a plethoric state appears to occasion the disease, the patient is to be restricted to a low diet, frequent purgatives are to be exhibited, and everything avoided that may determine the blood to the head; and to counteract such a tendency, occasional cupping, blisters, issues, &c., may be useful. If, on the contrary, there are marks of inantition and debility, a generous distantial tools madicines and other means of streamth. diet, with tonic medicines and other means of strengthening the system, will be proper. In this disease great care is necessary in the matter of diet, and moderation in quantity and simplicity in character are material points. When the appropriate remedies are judiciously employed, and the proper regimen strictly adhered to, opplepsy is often permanently cured, and the suffering is greatly mitigated even in those forms which do not admit of cure.—Ref. Copland's Dictionary of Practical Medicine; Cheyne's Cyclopadia of Practical Medicine. EPILOSUE, ept-s-log (Gr. ept, on or after; logos, a speech), amongst the ancient Greeks, the end or summing up of a discourse. In English, the torm is applied to the short poem, or prose address, delivered in a theatre at the conclusion of a play. It is, and has diet, with tonic medicines and other means of strength-

a theatre at the conclusion of a play. It is, and has been at all times, familiar in tone, and, except on extraordinary occasions, is mostly written in a merry vein. The intention of the epilogue is to create a kind been at all times, familiar in tone, and, except on extraordinary occasions, is mostly written in a merry vein. The intention of the epilogue is to create a kind and friendly feeling between the sofor and the audi-part of a play which lay between two choral songs.

ence; and it frequently alludes to the events, fashions, and follies of the day. One of the most charming epilogues is that spoken by Rosalind, at the conclusion of "As You Like It":—"If it be true that good wine needs no bush, 'tis true that a good play needs no epilogue: yet to good wine they use good bushes, and good plays prove the better by the help of good enilogues."

EPIPETALOUS, ep-e-pet'-a-lus (Gr. spi, upon ; petalon, a petal), in Bot., a term applied to the stamens when they are attached to the corolla, as in the primrose. This character marks the subdivision Epipetalæ or Epicorollæ, of the sub-class Corollifloræ. (See classi-

fication in article BOTANY.)

ETIPHANY, e-pif-u-ne (Gr. epiphaneia, a manifestation), a church festival held on the 6th day of January, in order to celebrate the manifestation of Christ. In early times this festival probably commanorated the nativity of the Saviour, his manifestation in the flesh, and his manifestation to the Gentiles. The service in the Church of England has reference to these three events. As a household festival, the Epiphany is better known by the name of Twelfth-night being the twelfth night from the Nativity). The practice of choosing a king and queen in family merriments upon that night has been traced back to a similar custom among the Romans during the Saturnalia.

EFIFHEGUS, ep-e-fe'-gus (Gr. epi, upon; phago, I devour), in Bot., a gen. of plants belonging to the nat. ord. Orobanchaces. The root of E. cirquinana is called cancer-root, from having been formerly used as an application to cancers. It was the principal ingredient in a once celebrated North-American nostrum,

called Martin's cancer powder.
EPIPHYTES. (See AIR-PLANTS.)

RPISCOPACY, e-pis'-ko-pā-se (Gr. episkopos, a bishop, or overseer), is that form of church government in which one order of the clergy is superior to another; as hishops to priests and deacons. Much discussion has taken place on the subject of episcopacy. Nothing conclusive can be gathered concerning it in the New Testament; but there can be no doubt that it existed universally in the Church from the earliest historic ages down to the time of the Reformation, and it is inferred, as no change can be shown to have taken place, that the same constitution existed from the time of the apostles. Presbyterians and Independents argue, on the other hand, that as there is nothing definite con-cerning it in Scripture, Christians are left a discretion-ary power of modelling the government of their church in such a manner as may seem to them most meet; and that every Christian society has a right to make and that every Christian society has a right to make laws for itself, provided these laws are consistent with charity and peace, and with the fundamental doctrines and principles of Christianity. "It cannot be proved," says Dr. Paley, "that any form of church government was laid down in the Christian, as it has been in the Jewish scriptures, with a view of fixing a constitution for succeeding ages, and which consti-tution, consequently, the disciples of Christianity would everywhere and at all times, by the very law of their religion, be obliged to adopt. Certainly to com-mand of this kind was delivered by Christ himself; and if it be shown that the apostles ordained bishops and presbyters among their first converts, it must be remembered that descons also, and desconesses, were appointed by them with functions very dissimilar to any which obtain in the Church at present. The truth seems to have been that such offices were at first erected in the Christian Church as the good order, the instruction, and the exigencies of the society at that instruction, and the exigencies of the society at that time required, without any intention, at least without any declared design, of regulating the appointment, authority, or the distinction of Christian ministers under future circumstances." The power vested in the bishops or higher elergy differs very much among the different episcopal bodies. The Roman Catholic and different episcopal bourse. The Koman Cababa and the Greek churches, as well as the Church of England, are episcopalian. (See Anglo-Catholic Church, Roman Catholic Church, Garek Church.)

#### Epistle

As these recitations in the early history of the Greek stage had nothing to do with the choral part, the term coessodion, with its Latin derivative episodium, began to be applied to any incidental narrative or digression in a poem which the poet has connected with the main plot, been when the poet has connected with the main plot, but which is not essential to it. In this light, the catalogue of ships is considered an episode in the "Hiad," and the description of the war in heaven is considered an episode in "Paradise Lost." Episodes should grow naturally out of the subject, and should either point out important consequences or develop hidden causes. The episode describing the destruction of Troy, in Virgil's "Æneid," is an episode of this kind. In the Virgil's "Æneid," is an episode of this kind. In the best poets, episodes are generally finished in the most careful and elaborate manner. The "Faery Queen" of Spenser, and the "Orlando Furioso" of Ariosto, contain so many long episodes, that the poems present all the appearance of an inartistic compilation of unconnected legends.

EPISTLE, e-pist-1 (Gr. epistole, a message or letter), is a letter written from one person to another. The Scriptural epistles are letters which were addressed by the inspired apostles to churches or individuals. Of these the apostle Paul wrote fourteen, St. James one, St. Peter two, St. John three, and St. Jude one. Those of SS. James, Peter, John, and Jude, are com monly called general or Catholic epistles, as not being addressed to any particular church, but to the churches addressed to any particular church, but to the courcies in general. It is not without its use that we have the doctrines of the Christian religion laid down, not by one apostle only but by several, so that the same divine truths are presented to us in different forms or through different media, and thus their manifold beauties and character are better displayed. In reading an epistle, we ought to consider the occasion of it, the circumstances of those to whom it was addressed, the time when it was written its general good and design. time when it was written, its general scope and design, as well as the intention of particular arguments and passages. By epistle in the liturgy is meant the first lesson in the communion-service, and so styled because it is generally taken from the sacred Epistles, though sometimes it is taken from the Acts, and occasionally from the Prophets. Almost all the lessons now read as epistles in the English liturgy have been in their present place and used by the Church for many ages. They are found in all the liturgies used before the revision in the reign of Edward VI.; and they also appear in all the monuments of the English liturgy before the invasion of William the Conqueror.

TETTATH, ep-e-tof (Gr. epi, upon; taphos, a tomb), the inscription upon a tombstone. Among the classical nations of antiquity, epitaphs were at first only inscribed upon the tombs of heroes and those who had made themselves distinguished in their country. Among the Greeks, the term was also applied to those verses which were sung in memory of a deceased person on the day of his funeral, or on its anniversary. son on the day of his funeral, or on its anniversary. Amongst the Romans, every family who consecrated a tomb to their relations had the privilege of inscribing an epitaph upon it. Both Greek and Roman epitaphs were distinguished by three qualities,—brevity, simplicity, and familiarity. The Roman tombs were generally situated by the side of the public road, and the epitaphs usually commenced with the words "Sta, viator,"—Stop, traveller. Sepulchral inscriptions seem to have first taken their origin in England in the 11th century. At that time they were always written in Latin. In the 13th century, most of the epitaphs were written in French; but the clergy and religious bodies still continued to write in Latin. English epitaphs were not written till the middle of the 14th century. The modern English, French, and lingish epitapis were not written till the middle of the 14th century. The modern English, Freuch, and German epitaphs are more numerous and varied than those of any other time or nation. They exhibit every variety of style and sentiment, from heraldic prolivity and epigrammatic conceit to majestic gravity. All epitaphs should be characterised by brevity and truth. epitaphs should be characterized by brevity and truth. The long tedious inscriptions upon some tombs are as untrue as they are ungrammatical, and would almost seem to substantiate the German proverb — "He lies like a tombstone, and is as impudent as a newspaper." Among the many famous epitaphs existing in England, may be mentioned the well-flower inscription on Sir Christopher Wren's monument in St. Paul's cathedral,

# **Epronvette**

" Si monumentum quæria-circumspice." If you ask for his monument, -look around.

The following epitaph, which is exquisitely touching and simple, was written by Ben Jonson, and inscribed on the tomb of the countess of Pembroke:—

"Underneath this sable hearse Lies the subject of all verse; Sidney's sister, Pembroke's mother. Death, ere thou canst find another Good, and fair, and wise as she, Time shall throw a dart at thee

Notwithstanding the solemn circumstances with which epitaphs are associated, they are often made the vehi-cles of pleasantry and satire. Goldsmith wrote the following upon Mr. Edward Purdon:—

"Here lies poor Ned Purdon, from misery freed, Who long was a bookseller's hack; He led such a damnable life in this world, I don't think he'll ever come back."

Burns wrote some very satirical epitaphs, and in France the same kind of grim humour has frequently been indulged in. The epitaph upon Robespierre is as

Passant, ne pleure point mon sort ; Si je vivais, tu serais mort." Dry your tears, passer by; If I lived, you should die.

EFITEALAMIUM, ep-e-thàl-ai'-me-um (Gr. epi, on; thalamos, a bridal chamber), a species of poem sung by the ancient Greeks and Romans near the bridal chamber of a newly -married couple. Poems of this character were written by Anacreon, Stesichorus, and Pindar. The epithalamium written by Catullus on the occasion of the marriage of Peleus and Thetis has always been much admired; and that written by the English poet Spencer has been described as one of the most gorgeous in all literature.

Epither. ep'-e-thet (Gr. epitheton, from epi, upon.

most gorgeous in all interature.

Epirmer, ep'-e-thet (Gr. epitheton, from epi, upon, and tithemi, I lay or place), is applied to an adjective expressing some real quality of the thing to which it is applied, or an attributive expressing some quality ascribed to it. Epithets are often used in poetry and rhetoric, not to make up any essential part of the description, but only by way of ornament. Even Homer has been found fault with on this head, for equipping every hero with an epithet, not according to the exigencies of the case, but to suit the measure of his verse. Nothing, says Aristotle, tires the reader more than too great a redundancy of epithets, or epithets improperly applied; and yet nothing is so essential in poetry as a proper use of them. Epithets are also sometimes applied as surnames, or as persons' second appellation, and were anciently bestowed very freely on account of excellencies or defects, either of body or mind,—even kings not being exempt from them; as, Edward Longshanks, Richard Cour de Llon.

them; as, Edward Longmanns, Richard Cour de Lion.

Epizoa, epe-ezo'd (Gr. epi, on; zoon, an animal), a
term applied to those parasitic animals which live
upon the bodies of other animals. They may be
divided into two classes,—those which live on the
surface of the skin, and those which live in the skin. In the first class may be mentioned fleas, lice, bugs, ticks, &c.; and in the second, the itch-insect or sar

In the first case may be meanated neas, nee, ougs, ticks, &c.; and in the second, the itch-insect or sarcoptes, the pimple-mite or Demodex folliculorm; together with other species of the Acardae.

EPOCH, e'-pok (Lat. epocha, point of time).—In Astron., the longitude or right ascension of a planet, at any particular moment of time, is simply called the epoch of that planet, for the sake of brevity. In order to determine the future position of a planet in the heavens at any particular period, it is necessary to reck on from its epoch, or known longitude at a certain point of past time. In Chron., the term epoch is used synonymously with era, and signifies a certain time from which we begin to count a series of years. (See Exa.)

EPROUVETTS, ai-proo-set (Fr.), in Mil., the name given to a contrivance by which the strength of gunpowder is ascertained. There are two methods of doing this; the first being effected by what is called the gun eprouvette, and the second by the mortar eprouvette. The latter is by no means an accurate test for comparing the strength of different kinds

London :-

## Epsom Salts

of powder, unless the grain of all the sorts to be tried be of the same size. A small charge is put into a mortar, and a suitable spherical iron shot is placed upon it. The charge is then exploded, and the distance to which the projectile is thrown is carefully measured. The range obtained is, of course, greater or less according to the strength of the powder. In the gun eprovette, a gun is attached to an iron rod at its centre of gravity, or point at which the gun would exactly balance if placed across a horizontal bar. The upper part of the rod is fastened to a horizontal bar. upper part of the rod is fastened to a horizontal bar, the ends of which rest in sockets, and which forms an axis, about which the whole apparatus may swing backwards and forwards when set in motion. From the lower part of the gun, and in a continuous vertical line with the bar by which it is suspended, a rod of line with the bar by which it is suspended, a rod of iron projects, the point of which works in a groove cut in a piece of wood fixed below it, in the form of the arc of a circle, whose centre is in the axis, about which the whole machine oscillates. This groove is filled with a soft substance. The gun is loaded with a carefully-measured charge of powder, and when fired, the recoil of the gun causes the point of the rod projecting from the under part to describe a line on the soft substance in the groove, the measurement of which determines the strength of the powder. Sometimes a brass quadrant is fixed to the unper part of the times a brass quadrant is fixed to the upper part of the rod by which the gun is suspended, on extent of the recoil is marked by an index. on which the

Erson Salts, ep'-sum, in Chem., sulphate of magnesia is known in commerce as Epsom salts, a name derived from the circumstance of its being largely contained in the springs in the neighbourhood of Epsom.

EQUATION, e-kwai'-shun (Lat. æqnare, to make even or equal).—In Astron., the rate of motion of the heavenly bodies revolving in elliptic orbits is variable, and they are, from different causes, sometimes in advance of and sometimes behind, the position in which they would be if they travelled at a uniform rate of motion. In be if they travelled at a uniform rate of motion. In calculating the position of a heavenly body from any epoch, a small amount, by way of correction, must consequently be added to or taken from its longitude at the time required, as it would be if it moved at a uniform rate; and this correction, in Astron., is termed an equation. There are various equations required in astronomical calculations of the longitude of heavenly bodies at circun periods arising from the required in astronomical calculations or the longitude of heavenly bodies at given periods, arising from the attraction exercised on the planets by the sun, and that which they exercise on one another and their satellites. The moon's annual equation, the equation of time, and the equation or precession of the equinoxes, will be noticed elsewhere. (See Sun, Moon, PRECESSION.)

EQUATION, ANNUAL.—The action of the sun upon the moon, by its mean influence, during many succes-sive revolutions of both bodies, tends to increase permanently the moon's distance and periodic time. This general average is not established without a series of subordinate fluctuations. In the lunar theory some of these are very sensible to observation. The most conspicuous is that termed the moon's annual equation. It is so called because it consists in an alternate increase and decrease in her longitude, corresponding with the earth's situation in its annual orbit,—namely, to its angular distance from the perihelion; and there-fore having a year instead of a month, or aliquot part of a month, for its period.

EQUATIONS, a term appled in Algebra to those propositions which assert the equality of two quantities. The sign = placed between the two quantities signifies that they are equal. Thus 5x + 10 = 25, is an equation expressing the equality of the quantities 5x + 10 and 25. A simple equation is that which contains only the first poper of the unknown quantity or quantities. Pure equations of the higher degrees are those which Pure equations of the higher degrees are those which contain the square or any higher power of the unknown quantity, and are divided into two classes.—pure and affected. A pure equation is that in which only one power of the unknown quantity is involved, and an affected equation is that in which different powers of the unknown quantity are involved. Thus,  $as^2 = b$  is a pure equation, and  $as^2 + bs = c$  is an affected equation. An affected quadratic equation is that which contains the square of the unknown quantity and also the unknown quantity itself. the unknown quantity itself.

## Hauida

EQUATOR, e-kwai'-tor (Lat. aques, equal), in Astron. and Geog., the name given to the imaginary great circles that surround the heavens and the earth midcircles that surround the neavens and the earth mig-way between the poles, so that every point in them is equidistant from each polar point. The plane of the terrestrial and celestial equator is at right angles to the axis of either sphere. The equator is so called because day and night are equal when the sun crosses it at the vernal and autumnal equinoxes in his passage

along the ecliptic.

EQUATORIAL INSTRUMENT, e-kud-to'-re-al, an astronomical instrument of exceedingly complicated con-struction, fitted with a declination-circle, an hour-circle, and a telescope for taking observations, su-pended in such a manner that it may be directed at pleasure to any point in the heavens that it may be desired to inspect. The whole instrument can be moved on two axes,—one of which is called the polar axis, as it is in the direction of the poles of the heavens; and the other, the transit or declination axis, which carries the odeclination circle, and is placed at right angles to the polar axis. The best equatorial instrument for general purposes is one called the Portable Universal Equatorial, made by Troughton. It is fixed on a stand, which can be brought to a proper level by means of screws and spirit-levels attached to its base. At the screws and appartneyers accanned to its rease. Account top of the stand, a horizontal axis is placed, moving in sockets in the ends of the uprights that rise perpendicularly from its base. The polar axis is fixed to the cross axis, and at right angles to it. This may be set in its proper position by a latitude-circle attached to the cross axis and moving in a plane parallel to to the cross axis, and moving in a plane parallel to that in which the polar axis moves. A tube, or inner axis, revolves within the tube which forms the polar axis, having an hour-circle attached to its lower ex-tremity, which is regulated by a tangent-screw placed at the opposite end. The rest of the instrument is attached to a plate fixed to the top of this inner tube, and revolving with it. Upright pieces rise from either end of the plate, with sockets to carry the transit-axis, at one extremity of which a declination-circle is fixed, at one extremity of which a declination-circle is fixed, and at the other a telescope. From the construction of the instrument, it will be seen that the plate fixed to the upper part of the inner tuhe of the polar axis, and the hour-circle at its other extremity, move in planes parallel to that of the equator when the polar axis has been properly adjusted. The method of using this instrument, and the principles or which it is made axill be better understood by

method of using this instrument, and the principles on which it is made, will be better understood by an inspection of the instrument itself, or a drawing of it on a large/scale.—Ref. Rees's Cyclopadia; English Cyclopadia,—Arts and Sciences.

EQUEREY, ch-we-re (Lat. equus, a horse; Fr. écuyer, a squire), an officer of state who holds office in her Majesty's household or in the household of princes of the royal family. An equerry is always in attendance on the Oneson on state occasions, and when she rides the royal family. An equerry is always in attendance on the Queen on state occasions, and when she rides or drives. The equerries are officers under the master of the horse, and the senior among them is designated this follower of the horse, and the senior among them is designated the following the designated the following the designation of the following th

tunales.

EQUESTRIANISM. (See HOBSEMANSHIP.)

RQUESTRIAN STATURS. (See STATURS.)
EQUID.M., e-kwi'-de, an order established for the reception of the horse and its allies. Their most striking character consists in the structure of the feet, which character consists in the structure of the feet, which are composed of but a single finger or toe terminating each extremity, and encased in a horny sheath or shoe, Besides this well-developed toe, however, the Equido possess on each side of the metacarpus said metatrasus two small rudimentary processes, which represent two lateral toes. The structure of the leg bores is much the same as in the generality of mammalia, except that the humerus and femur are comparatively short, and the bones of the forearm and shank, which are much longer, are partially ankylosed together, so that no

#### Equilateral

rotatory motion of these bones can take place. bones of the carpus and tarsus are large and solid, and nones of the carpus and taraus are large and solid, and resemble the bones of the other mammalis in their general arrangement. Beyond these we find a single elongated metatarsal bone, the representative of the middle toe. This is completed by three plaslanges, of which the last bears the single horny hoof. Dr. Gray thus defines the family of the Equide: —"This family (which is distinguished from all other animals by its undivided hoof formed of the two anterior trees sol-(which is distinguished from all other animals by its undivided hoof, formed of the two auterior toes sol-dered together, its simple stomach and its female having the tests placed on the pubes) may be divided into two very distinct types of form,—the one the asses and the zebras, which are always more or less banded with blackish brown, and have always a distinct dorsal line, the tail only bristly at the end, and have warts only on the arms, and none on the hind legs; and the true horses, which are not banded, have no dorsal line, are furnished with warts on their arms no dorsal line, are furnished with warts on their arms and legs, and have long hair on the tail from its insertion to its extremity." The skull of the Equidæ is of an elongated form, the jaws being well developed, the lower one especially being of great strength and power. Both jaws are provided with six incisor teeth; small canines are also present in both jaws in the males, but in the females these teeth are usually rudi-

of the neck and on the tail. The eye is rather large and full, and the external ears elongated, upright, and pointed. The most important species belonging to this family is, without doubt, the horse (Equus caballus). (See HORSE.)

EQUILATERAL, e-kwe-läte-e-rät (Lat. æquus, equal; lateralis, side), having all the sides equal; as an equilateral triangle. All the regular polygons are equilateral.

mentary or quite deficient. The molars are six or each side in each jaw; their worn surface is flat, and exhibits a complicated pattern of enamel, generally of

a lunate form. Between the molars and neisors there is a considerable space, and in this space is fitted the bit by which the animal is guided. The hair with which the skin is clothed is short on the general surface, but attaining a considerable length on the ridge of the neck and on the tail. The eye is rather large

lateral. EQUILIBRIUM, e-kwe-lib'-re-um (Lat. aquus, equal; libra, balance), in Statics, is a state of rest produced by the mutual counteraction of several forces. Two equal forces, acting in contrary direction, for example, destroy one another, and produce equilibrium; as when the two ends of a lever or balance, charged with equal weights, maintain a level position. (See MECHANICS,

ETATICS.)
EQUILIBRIUM OF ARCHES.—This is a subject which is treated in that part of mathematical science called Statics. In this the conditions are considered in which any body, or number of bodies, will remain in a state of rest under the influence of forces that act in opposite directions, and mutually counteract each other. It is evident that the conditions of equilibrium can be considered in theory only, as the slightest possible addition to either of the counteracting forces would addition to either of the counterating forces would immediately give it a preponderating influence, and destroy the state of balance. In investigating the equilibrium of arches, we must imagine the surfaces of the voussoirs to be perfectly smooth, and friction must be altogether disregarded, so that each stone may be considered to be sustained by the pressure of those on either side of it exting under these conditions in di considered to be sustained by the presence of those on either side of it, acting, under these conditions, in di-rections perpendicular to their surfaces. The theory on which the equilibrium of arches depends is briefly this, that the weights of the voussoirs of which it is comrough that the weights of the same proportion to each other as the sections of the chord of the arch, which are made by producing the lines which represent the junctures of the sides of the voussoirs to the centre from which the line sides of the voussoirs to the centre from which the line of intrados is described, supposing the arch to be a segmental arch. It is also necessary that the perpendicular passing through the centre of gravity of any part of the arch should pass through a parallelogram formed by lines drawn perpendicular to the sides of the part in question from their extremities. In such an arch the voussoirs at the crown would be the least in depth, and each successive voussoir, from the crown towards the piers, would increase in thickness, so that the line of the extrados would not be described from the same centre as that from which the line of intrados

## Equisetaceæ

has been described. The slightest alteration of the weight of any of the voussoirs of such ar arch as this, in which the stones that compose it are supposed to be supported without friction, would cause it to be over-turned; but when friction is taken into account, it is plain that an arch, which would remain in equilibrium under the conditions above stated, if they could exist in practice, would then be capable of sustaining a great amount of superincumbent pressure; and, indeed, pressure on the arch tends to make it stronger, by increasing the friction by which the pressure on it is resisted. The theory of the equilibrium of domes is somewhat similar to that of the equilibrium of arches, if we consider the dome to consist of a series of exactly equal and opposite slices, that are formed by planes passing perpendicularly through the axis at a small angle to each other, and which support each other at the crown, being, in fact, a number of balanced arches, the crown, being, in fact, a number of balanced arches, each of which would preserve its equilibrium, if it were left standing alone. But in the dome equilibrium will be maintained, and the structure will be stronger, if the weight of the upper part of each of such a series of contiguous balanced arches be greater than that which would be required to preserve equilibrium in a balanced arch of similar form standing alone; because every stone in each circular and horizontal course, or each of the whole series of the opposite parts of the balanced the whole series of the opposite parts of the balanced arches, exerts a lateral pressure on those on either side of it, and their tendency to fall inwards locks the whole structure tightly together. To insure the equilibrium of an arch, friction being disregarded, it is therefore necessary to bring the weight of the voussoirs composing the crown up to a certain limit, which must not be increased or diminished in any way; but in the dome, equilibrium will be maintained, for the reasons above extend when the weight of the unparaportion of above stated, when the weight of the upper portion of each of the series of arches of which it may be supposed to be composed exceeds this limit.—Ref. Robison's Mechanical Philosophy; English Cyclopædia,—Arts and

EQUINOCTIAL, e-kwe-nok'-shal (Lat. æquus, equal nox, night).—The celestial equator is sometimes called by this name, because day and night are of equal length all over the world when the sun crosses the equator.

EQUINOXES, ek-we-noks-ex, the points in which the great circles known as the ecliptic and equator cut each other. They are distinguished as the vernal and autunnal equinox. The sun is at the former on the 21st of March, when he enters the first point of Aries; and at the latter on the 22nd of September, when he enters the first point of Librs. In the southern hemisphere, the names of the equinoxes are transposed; the vernal equinox to those who are north of the equator becoming the autumnal equinox to those in countries lying to the south of it; and the autumnal, the vernal equipox.

EQUIFAGE, ek-we-paij (Fr. équiper), a term applied in general language to the carriage, horses, and liveries of a gentleman when abroad. The word is also applied of a gentleman when abroad. The word is also applied to the furniture of an army or body of troops. In this sense it includes arms, artillery, utensils, provisions, &c. Camp equipage includes tents and things necessary for accommodation in camp; while field equipage consists of arms, artillery, waggons, tumbrils, &c. In marine affairs, the word equipage is applied to the crew of a ship, together with all her furniture, masts, sails, ammunition, and general stores.

RQUIERTACHER, et-we-re-tail-se-c (Lat. equus, a horse; seta, a hair, or bristle), in Bot., the Horsetail fam., a nat. ord. of Acotyledones, sub-class Acrosens; con-

nat. ord. of Acotyledones, sub-class Acrogenæ; consisting of herbaceous plants, with striated, hollow, jointed, simple or verticillately-branched, acrial, silicious stems, arising from slender creeping rhizomes, or underground stems. The joints are surrounded by membranous toothed sheaths, which are regarded as modified leaves; but, in general, the plants of the order are considered leafless. When branched, the branches arise in a whorled manner from beneath the axis of the test of the content of the the teeth of the sheaths, and correspond in number with them. These plants are found in marshy or watery places in most parts of the world. There is but one genus, Equisetum, which includes about ten species, the greater number of which are indigenous. The rhizomes contain much starchy matter in the winter

months, which might be used as food in case of need. The silex, or flint, contained in the tissue of the rough horsetail, Equisetum hyemale, renders it a useful plant. Its stems are largely imported from Holland under the name of Dutch rushes, and employed by cabinet-makers, whitesmiths, and ivory-turners for smoothing

the surface of their work.

EQUISETITES, ek-we-se-ti'-tes (Lat. equisetum, the plant horsetail, in Geol., the name given to fossil plants which resemble the equisetum of our pools and marshes. They are found in all formations, from the Devonian upwards, and have jointed stems, surrounded by closely-fitting cylindrical sheaths, which are regularly toothed, and which leave their impress on the stems. They may be distinguished from the Calamites, for which they are apt to be mistaken, by their stems not being channelled throughout.

Being channeled introduct.

EQUIESTME. (See EQUIESTACE E.)

EQUIES, sk'-me-teez (Lat. plur. of eques, a knight, a horseman).—The equites, or knights, were a large and important body in ancient Rome, originally founded by Romulus, who divided his people into three tribes, and selected a hundred from each to serve on horseback as selected a nuncred from each to serve on noiseasce by his body-guard. Their numbers were increased by succeeding kings, and at last they became an order in the state, known as the equestrian order, in which any one could be enrolled who was possessed of the requi-site amount of property. They ranked next to the site amount of property. They ranked next to the senators, and occupied seats in public places of amusement that were especially set apart for them. They were distinguished by wearing a gold ring, and a border on their vestments a little narrower than that worn by the senators. They always formed the chief part of the Roman cavalry, if not the entire body, and were commanded by an officer of high rank, who was styled magister equitum, or master of the horse. Some idea may be formed of the number of the equites from the story told by Roman historians, that Hannibal sent to Carthage three bushels or measures (tres modies) of gold rings taken from the fingers of the knights that lay dead on the field after the battle of Canne, fought Aug. 2, 21t B.C., in which 40,000 Romans

EQUITY. ek-we-te (Lat. æquitas), in a moral and eneral sense, is that which, in human transactions, is general sense, is that which, in animal standard from the founded in natural justice, in bonesty and right, -sr equo et bono. "Equity, in its true and general meaning," says Biackstone, "is the soul and spirit of all law; positive law is constructed, and rational law is made by it. tive law is constructed, and rational law is made by it. In this, equity is synonymous with justice; in that, to the true and sound interpretation of the rule." It is applied to cases to which the law, on account of its generality, does not exactly apply, but which must be determined by the sound judgment of the proper interpreter. In this sense, equity must have a place in every rational system of jurisprudence, if not in name, at least in substance; for it is impossible that any code, however minute and particular, should embrace, or provide for, the infinite variety of human brace, or provide for, the infinite variety of human affairs, or should furnish rules applicable to all of them. Cases will occur to which the antecedent them. Cases will occur to which the antecedent rules will not apply without injustice, or to which they cannot be applied at all; and it is the office of a judge to consider whether the antecedent rule does, or ought, to apply to a given case. Hence arise a variety of rules in the interpretation of laws, according to their nature and operation, whether they are remedial or penal, or restrictive of general right, or in advancement of public justice. In the law of England, however, equity has a different and more restricted meaning. Remedies for the redress of wrongs, or for the enforcement of rights, are distinguished into two classes,—those which are administered in courts of equity. The rights secured by the former are called legal: those by the latter, equitable. The former are rights and remedies at common law; the latter, rights and remedies in equity. Much missunderstanding has prevailed regarding the distinctive features of these two branches of jurisprudeance. Some have represented them as two opposing and hostile powers, continually their nature and operation, whether they are remedial two pranches of jurisprudence. some have represented them as two opposing and hostile powers, continually at warfare with each other, and striving to encroach on each other's province, as if, in the language of Blackstone, "the one judged without equity, and the other was not bound by any law." It has also been 786

stated that a court of equity is not bound by rules or precedents, but acts from the opinion of the judge; and that the province of equity, as distinguished from law, is to determine according to the spirit of the rule, and not according to the strictness of the letter. In the early history of equity jurisprudence, there might have been much to give colour to these views; but in have been much to give colour to these views; but in the present day, courts of equity act upon principles as fixed and certain as those on which courts of law proceed. New cases may, and indeed do, arise; but they are decided upon these ascertained rules and principles, whatever may be the opinion of the judge as to what may be just or reasonable in the particular case before him. Equity, then, is a branchof jurispru-dence which aims at anynementing the defects of condence which aims at supplementing the defects of common law, by extending relief to those rights of property which the strict law does not recognize, and by giving more ample and distributive redress than the ordinary tribunals afford. It by no means either contrels, mitigates, or supersedes the common law, and does not assume any power to subvert its doctrines. Courts of common law proceed by certain prescribed forms, and give a general judgment for or against the defendant; but there are many cases in which a simple judgment for either party, without qualifications and conditions and particular arrangements, would not doentire justice to either. Some modification of the rights of parties may be required, some restraints on the one side or the other, or some peculiar adjustments, either present or future, temporary or perpetual. To meet these objects, the courts of law in this country have no provisions; they can only adjudicate by a simple judgment between the parties. Courts of equity, however, are not confined or limited in their modes of relief by such narrow regulations, but grant redress to all parties where they have rights. dence which aims at supplementing the defects of combut grant redress to all parties where they have rights, ex ague et bono, and modify and fashion that redress according to circumstances. Cours of equity, too, bring before them all the parties interested in the subject-matter of the suit, and adjust the rights of all, subject-matter of the sut, and adjust the rights of all, however numerous; whereas courts of law must limit their inquiries to the contending parties. The most general description of a court of equity, as given by Mr. Justice Story, in the "Encyclopedia Americana," is "that it has jurisdiction in cases where a plain, adequate, and complete remedy cannot be had at law; that is, in the common-law courts. The remedy must be plain; for if it be doubtful and obscure at law, equity will assert a jurisdiction. So it must be adequate at law; for if it fall short of what the party is entitled to, that founds a jurisdiction in equity. And it must be complete; that is, it must attain its full end It must be complete; then is, it must each it is must each the whole mischief, and secure the whole right of the party, now and for the future; otherwise equity will interpose and give relief." The jurisdiction of a court of equity is sometimes concurrent with that of common law, and sometimes it is It exercises concurrent jurisdiction in cases where the rights are purely of a legal nature, but where other and more efficient aid is required than a court of law can afford, to meet the difficulties of the court of law can afford, to meet the difficulties of the case and insure full redress. In some of these cases, courts of law formerly refused all redress, but will now grant it. The jurisdiction, however, having been once justly acquired by the courts of equity, at a time when there was no such redress at law, it is not now relinquished. The most common exercise of concurrent jurisdiction is in cases of accident, account, dower, fraud, mistake, partnership, and partition. The remedy here is often more complete and effectual than it can be at law, and in many cases falling under these heads be at law; and in many cases falling under these heads, and especially in some cases of fraud, mistake, and accident, courts of law cannot, and do not, afford any accident, courts of law cannot, and do not, afford any redress; in others they do, but not always in so full and perfect a manner. A court of equity is also assistant to the jurisdiction of courts of law in many cases where the latter have no like authority. It will remove legal impediments to the fair decision of a question depending at law. It will prevent a party from improperly setting up at a trial some title or claim which would be inequitable. It will compel him to discover, on his own oath, facts which he knows are material to the right of the other party, but which a court of law cannot compel him to discover. It will perpetuate the testimony of witnesses to rights and titles which are

## Equity

in danger of being lost before the matter can be tried It will provide for the safety of property in dispute, pending litigation. It will counteract and control, or set aside, fraudulent judgments, by restraining the parties from insisting upon them. A court of equity exercises exclusive jurisdiction in all cases of merely equitable rights; that is, such rights as are not recognized in courts of law. Most cases of trust and confidence fall under this head. Its exclusive jurisdiction is dence tall tinder this head. Its sections by little denoted has extensively exercised in granting special relief beyond the reach of the common law. It will grant injunctions to prevent waste or irreparable injury, to secure a settled right, to prevent vexatious litigations, or to compel the restitution of title-deeds. It will appoint compet the restriction of title-deces. It will appoint receivers of property where it is in danger of misapplication; will compel the surrender of securities improperly obtained; prohibit a party from leaving the country in order to avoid a suit; will restrain any undue exercise of a legal right against conscience and equity, and deerce a specific performance of contracts respecting real estates. It will in many cases supply the imperfect execution of instruments, and reform or alter them according to the real intention of the par-ties; will grant relief in cases of lost deeds or securities; and, in all cases in which its interference is asked, its general rule is, that he who asks equity must do equity. Whether it would be best to administer do equity. Whether it would be best to administer the whole of remedial justice in one court or class of courts, without any separation or distinction of suits, or of the forms or modes of proceeding, is a question upon which much difference of opinion exists. Lord Bacon has given it as his decided opinion, that the separation of common law and equity was wise and convenient. "All nations," he says, "have equity; but some have law and equity mixed in the same court, ont some nave law and equity mixed in the same court, which is worse; and some have it distinguished in several courts, which is better." Lord Hardwicke was of the same opinion; and, indeed, it is the general opinion in those countries, as England and the United States of America, where the two exist separately. "There is nothing," says Mr. Justice Story, "incongruous, much less abourd, in separating different portions of municipal jurisprudence from each other in the administration of justice, or in denving to one court the administration of justice, or in denying to one court the power to dispose of all the merits of a case when its forms of proceeding are ill adapted to afford com-plete relief, and giving jurisdiction of the same cause to another court better adapted to do entire justice by its larger and more expansive authority." It is most to another court better anapted to definite justice by its larger and more expansive authority." It is most probable that its suitability depends upon the habits, circumstances, and institutions of each particular na-tion, and that while it might be well adapted for one country or one age, it might be unsuitable for another. A suit is usually commenced in the courts of equity or A suit is usually commonced in the courts of equity or chancery by presenting a petition to the lord chancellor, containing a statement of the plaintiff's case, and praying for redress. Frequently allegations are made in a bill, of which the plaintiff is uncertain, or which are merely conjectural, in order to elicit from the defendant a full discovery of the truth. Formerly, a writ of subpona was issued, commanding the defendant to appear and answer the allegations of the bill within a certain time; but now, in place of the subpona, a printed bill is served, which has the same effect as the service of a writ of subpena. If upon the face of the bill sny cause be apparent why the redress should not be granted, the defendant may demur, or out in a demurrer; and if such cause exist, and yet not apparent upon the bill, he may put in a pleas stating such matter, and demanding judgment of the court, as in a demurrer. In either case, the subject is at once taken up and argued before the court, and, if allowed, the suit, or so much of it as is affected by the plea or demurrer, falls to the ground; but usually, on cause shown, the court will allow the plaintiff to amend his bill. If the defendant can neither demur nor put in a plea, and cannot disclaim, then he must answer, upon s writ of subposua was issued, commanding the debill. If the detendant can necessary and cannot disclaim, then he must answer, upon oath, the interrogatories in the bill, according to the heat of his knowledge and belief. If the answer is oath, the interrogatories in the bill, according to the best of his knowledge and belief. If the answer is sufficient, and the bill does not require amendment, issue is joined in the cause, witnesses are examined, the cridence is closed, and the cause set down for hearing, and heard in its term. In some cases, the decree made on the hearing decides all the questions in the cause; in other cases, preliminary accounts, 787

## Erastianism

inquiries, and directions, are adjourned to chambers; and when these are answered, the cause comes on for hearing on further cousideration, and the points in issue are disposed of. The court decides upon the proofs, arguments, and merits brought before it without the assistance of a jury; yet, if a serious doubt be entertained as to a question in fact, the court may direct an issue upon it to be tried by a judge and jury to at common law, and may now itself impants a jury to at common law, and may now itself impanel a jury to award damages to an injured party, either in addition to, or in substitution for, an injunction or specific performance, pursuant to 21 & 22 Vict. c. 27. This judges of the equity courts are the lord chancellor, the master of the Rolls, the two lords justices of the Court of Appeal in Chancery, and the three vice-chancellors. The ordinary business is transacted by the master of the Rolls and the three vice-chancellors.

EQUIVALENTS. (See ATOMIC NUMBERS.)
EQUULEUS, e-kyu-ul'-e-us (Lat., the little horse),
one of the old Greek constellations made by Ptolemy, and situated between Aquila and Capricornus. Its brightest stars are of the fourth magnitude only. There is another constellation, named by Lacaille Equaleus pictoris, the easel, or painter's horse, which is situated near the constellation Argo.

Eza, e'-ra (Lat. zra), the name given to a point of time that is marked by some remarkable occurrence, and from which it has been consequently determined to and from which it has been consequently determined to count the series of succeeding years. Various eras have been chosen by different nations, but fixed, indeed, in an arbitrary manner, from which they have reckoned the principal events occurring in their history in chronological order. The most important of these is the Christian era, which was invented by a monk, Dionysius Exignus, in the year 532 A.D. The first year of this era was supposed to be the year in which our Saviour was born; but this supposition has been found to be incorrect, as the birth of Christ is now allowed to have taken place four years previously. From this era the majority of the Christian nations of the world reckon events both backwards and forwards; any event which happened before this date being any event which happened before this date being spoken of as taking place in the year — before Christ, spoken of as taking place in the year spoken of astaking place in the year — before Christ, or B.C., and any which has happened since, as occurring in the year — of our Lord, or A.D. In the system of chronology generally adopted, the date of the creation of the world is fixed at 4004 B.C.; but the creation of the world is fixed at 4004 B.C.; Dut this is uncertain, and many different dates have then assigned to this event: thus, according to the Septuagint, it took place in the year 5872 B.C.; according to the Julian period, 4710 B.C.; and ac-cording to the mode of reckoning used by the Jews, 376 B.C. The other principal eras from which events have been reckoned by the Greeks, Romans, Window and Makemeters, are as follows.—The events have been regioned by the Greeks, klomans, Hindoos, and Mahometans, are as follows:—The Greeks reckoned by Olympiads, or periods of four years each, the first year of the first Olympiad coinciding with the year 776 B.C. The Romans reckoned from the building of the city Rome, which took place 753 B.C., in the fourth year of the sixth Olympiad. The principal Hindoo eras are those of the Cali Yuga and Vieramaditya, which correspond with the years 3103 and 56 B.C. The Mohameddan era, called the Hegira, dates from the flight of Mahomet from Mecca, which took place 622 A.D. The rules by which the year of the Christian era may be found that corresponds with a given year of any other particular era, and vice versa, will be found in the notice given of each important era under its own heading. (See Cali Yuga, Hegira, Olympian, Varronian Fra, &c.)

Errstianism, e-rās'-le-ān-izm, a religious theory, first propounded by Erastus, a German divine of the 16th century. His proper name was Liebler, or Lieber, which, according to the fashion of the day, be changed to the Greek equivalent Erastus, 'beloved.'

According to his theory, the pastoral office was only recremanic like that of a workeage of sciences over his Hindoos, and Mahometans, are as follows :- The

changed to the Greek equivalent Erastus, 'beloved,' According to his theory, the pastoral office was only persuasive, like that of a professor of sciences over his pupils, without any power annexed. The Lord's Supper, like other ordinances of the Gospel, was, he declared, to be free and open to all; the minister might dissuade any one from joining, but might not refuse. Erastianism referred the punishment of all offences to the civil magistrate. The theory was for a time prominent in England, and Selden, Lightfoot, Coleman, and Whitelocke, pelonged to the Erastian party.

#### Erbium

Errum, er'-be-um, in Chem., an exceedingly rare metal, found with yttrium and terbium in gadolinite. The oxide erbie is similar in its characteristics to alumina. It has a dark yellow colour, but forms

ERECETHEUM, or ERECETERIUM, e-rek-the'-um, one of the most important temples of ancient Athens, which stood on the north side of the summit of the Acropolis. The temple that originally occupied the site was built by Ercottheus, who reigned over Attica in the latter part of the latth century B.O. It was designed for the reception of the image of Minerva, carved out of the trunk of an olive-tree, which was always a special object of veneration to the Athenians. Ercettheus was buried in the temple; from which circumstance the name of Erechtheum was afterwards given to that which was built on the same site about 400-395 B.C., which was built on the same site about 430—395 n.c., the ruins of which may still be seen. The entire building forms a group of three temples,—the Erechtheum properly so called, the temple of Minerva Polias, and the Pandrosium. The Erechtheum occupied the largest space, and is supposed to have been built first of all. It is in the form of a parallologram, about 73 feet iong and 37 feet wide. The portice before the prothyrium looks towards the east, and was very shallow, if a wall existed between this and the prothyrium, as supposed by Stuart. The entablature and pediment of the portice was supported on six massive but elegant Ionic columns, enproted on six massive but elegant Ionic columns, en ported on six massive but elegant Ionic columns, enriched with carving, and about 27½ feet in height. The temple of Minerva Polias was attached to the north side of the Erechtheum, at the western end, and stood on a lower level. It was nothing more than an open on a lower level. It was nothing more than an open portice, 33 feet wide and 21 feet in depth, the roof being supported by six columns, four in front and one on either side, 25 feet in height. It looked towards the north, and was probably nothing more than a side portice added to the Erechtheum at some time subsequent to its erection. The Pandrosium was attached to the western end of the south wall, and was tached to the western end of the south wan, and was built at a much later date than the other parts of the building. The roof of the portico, which has a southern aspect, was supported by six caryatides. (See CARYATIDES, ELGIM MARBLES.) The interior of the Pandrosium, or cella of the temple, was formed out rangesium, or cour of the temple, was formed out of the lower or western end of the Erechtheum, a portion about twelve feet in width being separated from it for that purpose by a party wall. The portice of the Pandrosium is about 18 feet wide and 12 feet deep.

—Ref. Fergusson's Handbook of Architecture; Stuart's

Athens; Inwood's Erechtheion.

EREMOCAUSIS, e-re-mo-kaw'-zis (Gr. erema, slow; kausis, burning), in Chem., a term applied by Liebig to the slow decay of moist organic bodies by the absorption of oxygen without the production of heat. The slow decay of wood, under the combined influence

of air and moisture, is an instance of this action.

ERGOT OF HYB. (See SECALE.)

ERICACEM, 8-ri-kai-se-s (Lat. erica, heath), in Bot. ENICACE. R. e-ri-kai'-se-e (Lat. erica, heath), in Bot., the Heath fam., a nat. ord. of dicotyledonous plants in the aub-class Corollifore, consisting of 42 genera and about 850 species. They are very abundant at the Cape of Good Hope, and are more or less generally diffused throughout Europe, North and South America, and Asis. The following details give the general character of the order:—Shrubby plants. Leaves entire, opposite, or whorled, extipulate. Calyx 4—5-cleft, inferior, persistent. Corolla hypogynous, monopetalous, 4—5-cleft; setivation imbricated. Stamens hypogynous, as many, or twice as many, as the divisions of the corolla; anthera 2-celled, opening by a sions of the corolla; anthers 2-celled, opening by a pore, appendiculate. Ovary many-celled, with numerous ovules, surrounded by a disc or scales; style 1. Fruit capsular, rarely baccate; placenta axile. Seeds numerous, small, anatropous; embryo in the axis of fleshy albumen. By Lindley, the order has been numerous, small, anatropous; embryo in the axis of fleshy albumen. By Lindley, the order has been divided into two sub-orders, — Ericea, in which the fruit is loculicidal, or rarely septicidal, or berried, and the buds naked; \*\*Rhododendrea\*, in which the fruit is capsular, septicidal, and the buds soaly, resembling cones. Many of the \*\*Ericacea\*, particularly species of the genera Erica, \*\*Rhododendren\*, \*\*Kulmia,\*\* and \*\*Aralea\*, are largely cultivated in this country on account of the hearity of this \*\*Incorrect\*\*.

## Ermine

they are not confined to America, as the name would imply. Medicinally, the plants of this order are chiefly remarkable for astringent properties. Some, however, are narcotic, and a few even poisonous. The fruits of many are edible.

ERIDANUS, e-rid'-a-nus, a constellation formed and named by Aratus after the river Eridanus. It stretches along the heavens from Phoenix to Orion, in the shape of a winding river; it has one star of the first magni-tude, and many of the third and fourth.

ERIOCAULACER, er-e-o-kaw-lai'-se-e (Gr. crion, wool : kaulon, a stem), in Bot., the Eriocaulon, or Pipe-wort fam., a nat. ord. of monocotyledones, consisting of aquatic or marsh plants, with clustered linear leaves, usually grass-like, and minute uniserval flowers growing in dense heads. They are mostly natives of tropical America and the north of Australia. One species is found in Britain; namely, Eriocaulon septan-gulare, the pipe-wort. They have not been applied to any useful purpose.

EBIODENDEON, ere-o-den'-dron (Gr. erion, wool; dendron, a tree), in Bot., a gen. of the mat. ord. Sterculiaces. The most remarkable species is E. Samauma, a native of South America. Its trunk frequently overtops all the surrounding trees before it gives off a single branch. The hairy covering of the seeds of various species of this genus forms a kind of vegetable silk much used for stuffing cushions and

similar purposes.

Emiorhouth, ere-of-o-rum (Gr. erion, wool; phoreo, I bear), in Bot., a gen. of the nat. ord. Cyperacce, or Sedge fam., consisting of numerous species, commonly known as cotton-grasses, from their fruits being surrounded by cottony or downy hairs. These hairs are sometimes used for stuffing cushions. The leaves

are reputed to possess astringent properties.

Erming, evi-min (Fr. hermine), Mustela ermina,
Linn.—This little digitigrade animal is found generally
in temperate Europe, but is common only in the north.
It is not generally known that the ermine and the stoat It is not generally known that the ermine and the stoat are the same animal: the confusion arises from the change that takes place in the colour of the animal's fur at the different seasons. In the winter it is yellowish-white, the yellow hardly showing about the head, but gradually appearing more and more on the body, and increasing in intensity, so that some are of a pale yellow colour on their hind parts: then it is known as the ermine. About the end of March, however, the upper parts change to reddish-brown, of rather a dull tint, the lower parts continuing white: the tail remains black at the tip through all the changes. It is in the extreme northern regions that changes. It is in the extreme northern regions that changes. It is in the extreme normern regions that this change in the animal's colour takes place with greatest distinctness. With regard to the manner in which this change is brought about, naturalists are not unanimous. One of the highest authorities, however, Mr. Bell, expresses his belief that the winter change is effected not by the loss of the summer coat and the substitution of a new one, but by the actual change of colour in the existing fur; and he cites, in proof of this view of the subject, the case of the Hudson's Bay lemming, which, in Ross's first polar expedi-tion, was exposed in its summer coat on the deck to aton, was exposed in its summer coat on the coat means at the statute of 300 below zero, and the next morning the fur on the checks and a patch on each shoulder had become perfectly white; at the end of a week, the winter change was complete, with the exception of a dark band across the shoulders, and prolonged down to the middle of the back. Like many other species of this genus, the ermine has the faculty of ejecting a fluid of a strong musky odour. Its fur is in great request; at one time it was one of the insignia of royalty, and it is still worn by the judges. Comparatively few ermine skins are at the present time exported from Hudson's Bay; but even so lately as 1850, 187,000 skins were received in England from that and other places.

ERMINE, in Her., the name of one of the furs used for the lining of mantles, crowns, coronets, and caps of maintenance, as well as for the field and charges of and the bude naked; another bude soaly, resembling is capsular, septicidal, and the bude soaly, resembling armoral bearings. It represents the white skin of the cones. Many of the Ericacea, particularly species of the genera Erica, Rhododendron, Kalmia, and Aralea, is tipped with black, attached to it, as in ladies' mufts, are largely cultivated in this country on account of the beauty of their flowers. The three latter genera spots and stripes, or tails, on a white field, each stripe are commonly called American plants by florists; but having two lines, or hairs, diverging from it, one on

#### Erosion

either side, and being surmounted by three spots, one placed at the extremity, and the others just below it, on each side of the point. There are four varieties of on each side of the point. There are four visited and stripes on a black field; Erminois, black spots and stripes on a gold ground; Pean, gold spots and stripes on a black ground; and Erminies, like ermine, but having a red hair diverging from either side of the string intend of a black one stripe, instead of a black one.

EROSION, e-ro'-thun (Lat. erosus, gnawed or worn away), the act of gradually wearing away; the state of being gradually worn away. In Geol., this term is employed to distinguish those features which are the results of the slow destructive action of running water, glaciers, the waves, and other agents; thus, valleys of crosion are those valleys which have been gradually cut out of the solid strata. Most of the ravines and glens and river-channels in the British isles are the results of erosion; for whatever inequalities of surface may have originally directed the waters into their channels, all the subsequent deepening, scooping out, canancies, all the subsequent deepening, scooping out, and widening of the valleys, have been owing to the erosive force of running water, laden with sand, gravel, and other triturating débris. The destructive action of breakers is very remarkable. Along the eastern coasts of Scotland and England, as is proved by old records, land existed far outside the present shore; the sites even of important towns of the 12th or 15th century being now under the sea. Even still, in many places, whole acres are annually consumed, and the total known destruction of the last few centuries is to be measured sometimes by miles. All sea-cliffs, crags, and pinnacles of rock may, as a general rule, be regarded as evidences of the crosion and destruction of the formerly more widely extended land by the moving surface of the sea. Just as actual sea-cliffs are proofs of the erosive action now in operation, so in almost all cases, inland cliffs, orags, scars, and precipices, as well as valleys, ravines, gorges, and precipices, as well as valleys, ravines, gorges, and mountain-passes, are proofs of the erosive action of the sea in times when the land stood at a lower level the sea in times when the land stood at a lower level with respect to it. A still more wonderful example of crosion is frequently afforded in a low and gently undulating district, from which the very mountains themselves, that geologists can prove once covered it, have been removed. (See RIVEE, GLACIEE, ICEBERG.) Exorto Poetray, e-rot'-ik (from Gr. eros, love), a term applied, in Greek and Roman literature, to amatory poetry. It is particularly used to signify the works of a certain class of romance writers and the Milesian tales. Excits poetry belongs more especially to the

tales. Erotic poetry belongs more especially to the later periods of classic literature, and it abounds in sophistical subtleties and ornaments. The most distinguished writers of this kind of poetry were Achilles Tatius, Heliodorus, Anacreon, Sappho, Ovid, Tibullus, Propertius.—For a collection of these writers, see Scriptores erotici Graci, curá Mitscherlichii.

EBRATO-BLOCK GROUP, er-rdf-ik (Lat. erraticus, wandering), in Geol., a synonym of the boulder clay, from the large transported blocks of stone which occur in it. The blocks, or boulders, are sometimes briefly

designated erratics. (See BOULDERS, PLYISTOGENE.)
ERRATUM, er-rai'.tum (Lat.), a term applied to those errors which have been overlooked in the composition or impression of a work. A list of the errata is generally placed at the beginning or end of a book.

ERRHINES, er-rines (Gr. errinen, from en, in; rin, the nose), in Med., those medicines which are applied to the mucous membrane of the nostrils. The term sternutatories is restricted to those which cause speezing. Errhines may be applied in a dry, soft, liquid, or gaseous state; they may be emollient, astringent, or stimulant,—the first sheathing irritated surfaces; the second restraining inordinate secretion, the consequence of relaxation; and the third favouring the natural mucous discharge, on the return of the secreting

# Ervsipelas

writ of error (in Latin, de errore corrigendo) used formerly to be brought for the eemedy thereof. Now, however, by 15 & 16 Vict. o. 76, this writ is, in almost every case, dispensed with; and proceedings in error consist of a simple memorandum of error lodged with the officer of the court, accompanied, if the error be in fact, with an affildavit to that effect. Error may be either now part and for the many the effect of the court either upon matter of fact or upon matter of law; but it is generally upon the latter. Formerly, writs in error were resorted to on very trivial grounds (as mis-spellings and other clerical errors), and interfered greatly with the due administration of justice; but it is now provided, that no judgment shall be reversed on account of any imperfection, omission, or defect of form; and even in case of material mistake, it is declared lawful for the superior courts, or any judge thereof sitting at nisi prius, at all times to make such amendments as may be necessary for the purpose of deter-mining in the existing suit the real question in contro-A writ of error must be commenced and proseversy. A writ of error must be commenced and prosecuted with effect within six years after the judgment is signed, or after the right of the party aggreeved to bring error accrued. Error lies only for some mistake

bring error accrued. Error lies only for some mistake in the proceedings in a court of record; for to amend errors in a base court a writ of false judgment is the remedy.—Ref. Stephen's Commentaries.

Ease, ere (a corruption of Irish), is a name given by the lowland Scotch to the Gaelic, or language of the inhabitants of the Highlands, from their being supposed to have come over from Ireland. (See Gaelic.)

Exvir, er-num (Lat. eruo, I pull up by the roots), in Bot., the Tarc, a gen. of the nat. ord. Leguminosa, sub-ord. Papilionacea, consisting of herbe with weak and slender etems, small papilionaceous flowers, and pods containing from two to four seeds. The species are common fodder plants in many parts of the world. The seeds of the E. Lens are called lentile, and have been used as human food from the earliest ages. They are seldom eaten in England; but throughout the conare seldom eaten in England; but throughout the continent of Europe, and in many parts of Asia, they are largely consumed. The lentil is considerably smaller than an ordinary pea, and is of the shape of a double convex lens; in fact, the word lens is simply the Latin name for this description of pulse. Several varieties of the lentil are cultivated; that which is most esteemed in France is termed lentille à la reine; it is very small, and has a reddish colour. Lentils are very in France is termed leatille à la reine; it is very small, and has a reddish colour. Leutils are very nourishing, but somewhat indigestible. The seeds of E\*Breilia, the bitter vetch, are said to be poisonous. Envirence. Farsirelas, ere-sip'e-las (Gr., from eruo, I draw, and pelus, near or adjoining), in Med., is the name given to a peculiar kind of inflammation of the skin, and pelus alled the side of the skin, and pelus alled the side of the skin, and the skin the side of the skin and the skin the skind of the skin the s

given to a peculiar kind of inflammation of the skin, so called from its tendency to spread to adjoining parts. It is known also as St. Anthony's fire or ignis sucer, and in common language as the Rose. It most commonly attacks the head and face; but it also sometimes occurs on other parts of the body. The local inflammation is preceded and accompanied with fever, and there are also usually certain premonitory symptoms that precede the outbreak of the disease; the patient felselli,—shivery, feeble, languid, and often drowsy. After these symptoms have continued for some time, a red snot appears on some part of the body, accompanied red spot appears on some part of the body, accompanied with a burning heat and tingling. When attacking when a current nest and ungung. When attacking the fuce, it usually makes its appearance on the bridge of the nose, and rapidly extends itself to the cyclids, cheeks, and forehead. The redness is not intense, but rather of a pale rose-colour, and goes away temporarily on pressure, but returns immediately on its removal. and no pit remains after the pressure. By the second night, or morning of the third day, after the commencement of the fever, the face begins to swell, the eyes are completely closed, and the form of the features scarcely recognizable. On the fourth or fifth day vegicities day, resications appear on the inflamed surface, and break or subside on the fifth or sixth, when the redness surface to a healthy state. The aromatic errhines commonly applied are powdered herbs.—as mint, arender, and rosemary; also tobacco as snuff. Ammonia and its carbonates are much employed. Acrid regetables and poisons, and preparations of mercury, are applied in rare cases.

Enson, er eror (Fr. erreur, from Lat. erro, I err, or go astray), in Law, signifies something wrong in the pleadings, or process, &c., upon which a writ, called a 1889.

#### Erythema

ration rarely occurs, except occasionally in the eyelids or scalp. Sometimes the inflammation and swelling or scalp. Sometimes the inflammation and swelling extend to the neck and throat, and may produce suffocation. In very bad cases, delirium and come come on, and death ensues from effusion on the brain. No remission of the fever takes place on the appearance of the inflammation; but, on the contrary, it generally increases with the progress of the inflammation, and only ceases when it goes away. When the complaint is mild, the inflammation and fever generally cease gradually without any evident crisis. A mone frequent gradually without any evident crisis. Among frequent causes of this disease, are exposure to a cold and moist atmosphere, sudden changes of temperature, intemperature, and unwholesome articles of food. It is sometimes also induced by wounds or sores, or even a slight puncture or scratch of the skin in persons predisposed to it. It is likewise contagious, and has to be strictly guarded against by means of ventilation and cleanliness in hospitals. Though the proper seat of the inflammation is the skin, it frequently extends to the parts underneath. Authors usually distinguish four kinds of this disease,—the phlegmonous, cedematous, gangrenous, and erratic, The first of these is characterized by the greatest degree of inflammation. In the adematous, the inflammatory symptoms are less intense, but the tunefaction is greater. It most commonly affects persons faction is greater. It most commonly affects persons of debilitated constitution, dropsical persons, and those who have been long subject to other chronic maladies. It is attended with considerable danger when it affects the face, and often terminates fatally on the seventh or eighth day. The gangrenous form most commonly occurs in the face, neck, or shoulders, and is accompanied with symptoms of low fever and delirium, which is succeeded by coma. The colour of the affected partie of a darkred, and scattered vesicles appearance the artiface which fragmently terminate in conupon the surface, which frequently terminate in gan-grenous ulcerations. It is always a tedious, and often a fatal form of the disease. In erratic crysipelas, the a fatal form of the disease. In erratic crysipelas, the morbid patches appear one after the other in different parts of the body; sometimes thus travelling progressively from the head to the extremities. It is rarely attended with danger, and usually terminates in a week or ten days. In the treatment of crysipelas, very much depends upon the nature of the disease and the condition of the patient. If the patient be young and sanguine, and the inflammation high, bleeding may be had recourse to. When, on the other hand, the system is enfeebled, tonice, a nourishing diet, and even stimulants, may be necessary in order to and even stimulants, may be necessary in order to strengthen the patient. In general, moderate purga-tives, diaphoretics, and strict confinement to bed, are to be adopted. In order to allay the local irritation, it is recommended to wash the part from time to time with warm milk-and-water. [A solution of nitrate of silver has been employed in some cases with very beneficial results.

ENTIREMA, ere-the'-ma (Gr. eruthros, red), in Med., is a lesser kind of erysipelas, being characterized in like manner by some degree of redness of the skin and disorder of the constitution, but with little swelling, and little tendency to suppuration or vesication. It is not infectious. Medical writers distinguish six varieties of this disorder. It usually arises from some local irritation, or from a disordered state of the digestive organs. In the former case, it is to be remedied by the removal of the cause of irritation and the ablution of the part with warm water or some gentle stimulating lotion. In the latter case, the proper remedies for restoring the healthy condition of the digestive organs are to be employed.

ERYPHEMA, er-e-thre'-ā (Gr. eruthros, red), in Bot., a gen. of Gentianacea, consisting of herbaceous plants with erect branching stems, having opposite entire leaves, and pink, whitish, or yellow flowers. The most important species is E. Contaurium, the common centarry, an indigenous plant, having bitter tonic properties similar to these of gentiars.

taury, an indigenous plant, having otter tonic properties, similar to those of gentian.

ERTHEIMA, er-ith-ri-nā (Gr. eruthros, red), in Bot., the Coral-tree, a gen. of the nat. ord. Leguminose, sub-ord. Papilionaceæ; consisting of small trees, shrubs, and under-shrubs, natives of India, America, and the West Indies. Nearly all the species are remarkable for the brilliant scarlet colour of their flowers, owing to which they are much coldinated ag stove plants.

## Escape

ERYTHROPHLGUM, er-tith-rof'-le-um (Gr. eruthros, red; phioion, bark), in Bot., a gen. of the nat. ord. Leguminose, sub-ord. Mimosee. E. guineense is the sassy-tree of Western Africa, the bark of which, under the name of "ordeal bark," or "doom bark," is used by certain tribes as an ordeal to which persons suspected of witchcraft or secret poisoning are subjected, from the superstition that their innocence or guilt will be indicated by the effects produced by the bark on the system.

ERTHROXYLACES, or-e-throks-clai-see (from erg-throxylon, from Gr. eruthros, red, and xulon, wood), in Bot., the Erythroxylon fam., a nat. ord. of dicotyledonous plants, in the sub-class Thatamiflore; consisting of but one genus, Erythroxylon, which includes seventy-five species, natives of the warmer regions of the globe, and especially abundant in Brazil. This order is closely allied to Malpiphiacea, and in fact scarcely presents characters sufficient to warrant its separation from that order. Some of the plants are tonic, others purgative, and others stimulant and sedative. The wood of E. hypericifolium, and the bark of E. suberonum, are red, and are used for the preparation of dyes of that colour. Red is, in fact, the common colour of the wood throughout the genus; hence its name, which signifies red wood. The most important species is E. Coca, the leaves of which are much used by the Peruvians and other peoples of South America to form a masticatory, which is prepared by adding to them a very small quantity of an alkaline paste made from the ashes of different plants, or even a little common quick lime. The Indians of Peru have always ascribed to the coca marrellous virtues, believing that it will lessen the desire and necessity for ordinary food. Spruce says that an Indian with a chew of this masticatory in his cheek will go two or three days without food, and feel no desire to sleep. Dr. Weddell, however, speaks far less highly of the virtues of the coca; he states that it does not satisfy the appetite, but merely enables these who chew it to support abstinence for a length of time with a feeling of hunger or weakness. The use of coca is said to prevent the difficulty of respiration which is generally experienced in ascending long and steep mountains. Its excessive use is stated to be most injurious, producing analogous effects to those occasioned by the immoderate cousumption of opium and fermented liquors. Johnston has computed the annual consumption of coca at 30,000,000 lbs,, and has stated that its c

ENTREMANTION. (See ERYTHROXYLACEE.)
ESCALADE, es-kid-laid' (Fr., from Lat. scala, a ladder), a term applied, in military language, to a forious attack made by troops on a fortified place by means of ladders. In modern wariare escalades do not occur so frequently as in the olden time: they were then generally made at night, stealthily and in silence. Among the most celebrated modern escalades may be mentioned that made by the French troops at the sign of Prague, in 1741, and that of Antwerp, in 1832.

of Frague, in 1741, and that of Antwerp, in 1852. EscalLOMACES, es-khil-lo-ne-ai/se-e (in honour of Escallon, a Spanish traveller), in Bot., the Escallonia fam., a small nat. ord. of dicotyledones, sub-class Carlegifore, consisting of evergreen shrube, with afternate exstipulate leaves and axillary showy flowers. They are chiefly natives of the mountains of South America.

ESCALOP, or ESCALLOP, es-käll-lup (Du. schalp, a shell), a fam. of bivalve mollusks the shells of which are deeply indented. In the centre of the top of the shell is a trigonal sinus, with a hinge consisting of elastic cartilage. In Her., the escallop-shell is a frequent bearing in the escutcheon, it having been the pilgrims' ensign in their expeditions to the Holy Land.

pilgrims' ensign in their expeditions to the Holy Land.
ESCAR, es-kusy' (Fr. éshapper, to fly from), in
Law, is a violent or privy evasion out of some lawful
restraint; as where s man is arrested or imprisoned, and gets away before he is delivored by
due course of law. Officers who, after arrest, negligently permit a felon to escape, are punishable
by fine; but it is regarded as a much more serious

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offence if the escape is effected by the consent and connivance of the officer, and is generally looked upon in law as punishable in the same degree as the offence of which the prisoner is guilty, and for which he is in custody, whether treason, felony, or trespass. outsuce or which the prisoner is guilty, and for which he is in custody, whether tresson, felony, or trespass. Breach of prison by the prisoner himself, when committed for any cause, was felony at the common law; but this serveity was afterwards mitigated, and now no person shall have judgment of life or member for the prison of the pri breaking prison, unless committed for some capital offence. But to break prison and escape when lawfully committed for any treason or felony, still remains felony, as at the common law, and is punishable with penal servitude for not more than seven or less than three years, or imprisonment not exceeding two years. To escape from confinement under sentence or order of penal servitude is punishable by penal servitude for life. To break prison when lawfully confined on some inferior charge is a high misdemeanor, and punishable by fine and imprisonment.

ESCAPRMENT. (See HOROLOGY.)

ESCARP, or SCARP, cs'-karp (Fr. escarper, to cut, strip), in Mil., that side of the ditch which forms the lower part of the rampart of a fortress, and which is below the natural level of the ground, or the summit of the glacis on the other side, is called the escarp or scarp. The slope of the escarp depends on the nature of the earth in which the ditch is cut, and the manner in which it is finished, varying from an angle of 45° with the level of the bottom of the ditch, if it consist of the soil only and loose rubble, to one of 80°, if the

of the soil only and loose rubble, to one of 80°, if the escarp be revetted with masonry.

ESCARPMENT, es-karp'-ment, a term applied to the steep and precipitous side of any cliff or hill, formed, in some cases, by the action of water, and in others by the abrupt termination of geological strata. The cliffs above the Giant's Causeway, and the promontory known as the Fair Head, Antrim, afford good examples of natural escarpments. The expression is also applied to rocks and hills that have been cut away by artificial means for military purposes, as in many parts of the rock of Gibraltar, which have been scarped

to render them inaccessible to an enemy.

ESCHALLOT, es-shall-lot' or shall-lot' (Fr. échalote),

Allium ascalonicum, a species of small onion or garlic.

Liss said to have come originally from Palestine.

ESCHAROTICS, es-kis-rof-siks (Gr. eschara), the crust of a scar produced by burning substances of a caustic nature which have the power of searing or destroying the flosh. The term is generally applied in Surg. to mild causting a 18se Clympur Carento.

mild causties. (See CAUTERY, CAUSTIC.)

ESCHEAT, es-tsheut' (Nor.-Fr. eschet or echet, chance or accident), in Law, is defined to be "an obstruction of the course of descent, and a consequent determination of the tenuro, by some unforeseen contingency, in which case the land naturally results back, by a kind Where the tenant of lands in fee dies without having aliened them in his lifetime, or disposed of them by will, and leaves no heir behind him to take them by will, and leaves no near remain and to execute of descent, they escheat to the grantor or lord of the fee. In order to complete this title by escheat, it is necessary that the lord perform an act of his own by entering on the lands and tenements so escheated; on failure of which, or by doing any act that amounts to an im-plied waiver of his right, as by accepting rent of a stranger who usurps the possession, his title by eschest is barred. The law of eschests is founded upon the principle that none can inherit a person's estate but such as are of his own blood and consanguinity, and that when such blood becomes extinct, the inheritance tiself must fail; aence, too, by the feudal system, the tenant, on attainder of treason or felony, not only for-feited his land, but his blood was held to be corrupted or stained, whereby every inheritable quality was en-tirely blotted out and abolished, so that no land could thereafter be transmitted from him or through him in a course of descent. If a bastard dies intestate and a course of descent. If a bastard dies intestate and without issue, his lands escheat to the lord of whom they are held; for bastards being regarded as multius filti,—the sons of nobody, are looked upon as having no blood in them, or, at least, no inheritable blood. Recheats are commonly divided into two classes,—propter defectum canguints,—from deficiency of blood; and propter delicium tenentis,—through delinquency of the

bolder, where, by attainder, the blood of the person attainted is so corrupted as to be rendered no longer inheritable. The attempts of recent legislation have been to modify this law, and now no attainder for felony, except treason or murder, extends to the disinheriting of any heir, or to the prejudice of the right or title of any person other than the right or title of the offender during his natural life.

ESCUTCHEON, es-kutsh'-un (Lat. scutum, Fr. sousson, a shield), in Her., the name given to the shield on which armorial bearings are depicted. The shield may be of any form, but the shape generally adopted is that of a square, a brace with the central point turned outwards, or two lines projecting outwards, and inclined to each other at a very large obtuse angle, being used at the bottom instead of a horizontal line to connect the sides. The armorial bearings of a lady entitled to bear arms, being unmarried, or a widow, are em-blazoned on a shield in the form of a lozenge.

ESCUTCHEON OF PRETENCE.—When a man marries an heiress or co-heiress, he places the armorial bearings of his wife's family on a small shield, exactly in the centre of his own coat. This shield is called an escutcheon of pretence, and signifies that the children by such a marriage inherit the coat armour of their mother's family, as well as real property, and are the representatives of that family, as well as that of their father. On the death of the father, the children bear the armorial bearings of their mother's family quarterly

with the paternal cost.

ENDARS, ez'-dräs, is the name given to two apocryphal books of the Old Testament. In the list of apocryphal books in the sixth article of the Church of England they are called the third and fourth books of England they are called the third and fourth books of Esdras, Ezra and Nehemiah being sometimes called the first and second books of Esdras or Ezra. The books of Esdras (i.e. the third and fourth) never formed any part of the Jewish canon; they were re-jected from the canon by the Council of Trent, and are not read in the service of the Charch of England. They are commonly supposed to have been originally written in Greach by some Hellenistic Jawa. though They are commonly supposed to have been originally written in Greek by some Hellenistic Jews, though some imagine that they were first written in Chaldee, and afterwards translated into Greek. It is uncertain when they were composed, though it is generally agreed that the author wrote before the time of Josephus.

Esparso, or Spanism Gazes, espar-to (Sp.), is a species of grass, the stipa, or Macrochlou tenucissima, obtained from Africa and Spain. In Spain it is plaited and used in many ways, and a great deal of the cordage employed in the navy of that country is made from it. Within the last few years esparto has been largely imported into this country for making paper. It grows in bunches or tufts from two to four feet in height, "and consists of a long, flat, lanceolated leaf or blade, which, as the sap descends and the plant ripens, takes which, as the sap descends and the plant ripens, takes a cylindrical form. It is pulled up from the roots, exposed to the sun, and, when dry, laid in small bundles, and these again, for facility of carriage, into larger ones, which are transported in carts, or more generally on donkeys' backs (both in Spain and Africa, in the uncultivated and wild districts of the country where the plant exists, being, comparatively speaking, without roads) to the port of shipment.—(Ure's Diet.) At the beginning of the year the plant was selling at £5 per ton, and about 50,000 tons of it are now imported.

ESOX. (See PIPE.) ESPLANADE, es-plon-aid' (Fr.), in Mil., the term sp-plied to the open space that should surround a citadel, and intervene between the main ditch and any fortifications that may be thrown up round the town near which the citadel is situated. The esplanade should be about five or six hundred yards in breadth, measuring from the crest of the glacis.

ESQUIMAUX Don, es'-kwe-mo.—This animal is rather BEQUIMAUX Dog, et ... kwe-mo.—This animal is rather larger than the English pointer, but appears less, en account of the shortness of its legs. It has oblique eyes, an elongated muzzle, and a bushy tail, which combine to give it a wild and wolfish appearance. The colour is generally a deep dun, obscurely barred and patched with darker colour. In the northern parts of America and the neighbouring islands, this animal is the only beast of hurden. With a team of dogs harnessed to his aledge, the Esquimaux may soud over the snow at a rate of sixty miles a day, and this for several days in succession. The driver has no reins; but he has a long whip, and that answers every purpose, as the old and knowing dogs are always put to the fore, and know their way across the vast blank anow-fields with unerring correctness; and should the "shafters" prove refractory, a few cruel lashes with

the fore, and know their way across the vast Diank anow-fields with unerring correctness; and should the "shafters" prove refractory, a few cruel lashes with the reindeer thong quickly bring them to a sense of duty. It is a rule, however, among sledge-drivers to use the whip as seldom as possible; not, it must be confessed, from motives of humanity; but the chastisement of one of the team generally leads to considerable confusion; the dog struck at once falls to biting and mauling his next neighbour, and so the traces become entangled, and a general fight ensues, neally ending in the upsetting of the vehicle and the loss of an hour in getting things in order again.

Exquulty, es-kwire' (Fr. covyer, a shield-bearer; Lat. scutifer).—In the middle ages and the days of chivalry, the esquire was a young gentleman of good family in immediate attendance on a knight, who carried his shield and performed many duties in his capacity, which were not, however, of a menial nature. The esquire first served as a page in the knight's household. When he was old enough, and possessed of sufficient strength and skill to hear arms, the page was promoted to the rank of esquire, and attended the knight tournaments and in the battle-field. He eventually became a knight himself, after exhibiting such provess became a knight himself, after exhibiting such prowess in the field or elsewhere as might entitle him to claim the spurs and other insignia of a knight. In the present day, the title of esquire should give the hearer precedence over gentlemen properly so called, who are entitled to hear coat-armour; but is of no value, owing to its universal assumption by those who have no claim whatever to attach it to their names. The following are those who are properly entitled to this appellation:—The sons of younger sons of dukes and appellation:—Ine sous of younger sous of earls, viscounts, and barons; the eldest sons of these younger sons just mentioned, with those of baronets and knights; barons; the eldest sons of these younger sons just mentioned, with those of baronets and knights; officers of the royal household; captains in the army and navy, and all officers above the rank of captain; doctors of law and medicine, barristers, sheriffs of counties, magistrates while in the commission of the peace, and Royal Academicians.—Ref. English Cyclopadia,-Arts and Sciences.

Essay, es'-sai (Fr. essai, a trial, an attempt), in Lit., is a name given to a species of composition which is characterized by greater latitude of construction is characterized by greator latitude of construction than is allowed in any other species of composition, and it differs from narrative in generally treating of mental or moral qualities. It is defined to be "in mental or moral qualities. It is defined to be "in general, a short disquisition on some subject of taste, philosophy, or common life" It is thus applied to philosophy, or common lite." It is thus applied to periodical papers published at different times on sub-jects of general interest; as morals, criticism, matters of taste, &c. This species of writing may be said to have of taste, &c. This species of writing may be said to have originated in this country in the beginning of the last century, by the publication by Addison and Steele of the Tatler. The Tatler was succeeded by the Spectator, to which Addison was the chief contributor; and the Spectator was followed by the Rambler of Dr. Johnson. Numerous works of this class appeared in the latter half of the 18th century; but they have since gone out of fashion.

ESSEMES, es'-seenz (Gr. essenoi), a sect which existed among the Jews during the lifetime of Christ. They are not mentioned in the New Testament, but they are described by Josephus and Philo. The authentreity of the account ascribed to the latter is, however, doubtful, as a work in his name, "De Vita Contemplativa," is proved to have been written by a Christian plativa," is proved to have been written by a Christian monk. According to Josephus, the Jews were divided into three sects,—the Pharisees, the Sadducees, and the Essense. The Sadducees were essentially a polithe Essenes. The Sadducees were essentially a poli-tical party, and the Essenes were those who carried out the views of the Pharisees to an extent which made them ridiculous in the eyes of the party from which they sprung. Levitical purity hemmed them in with so many restrictions that it soon became necessary for them to live in retired and lonely places.

They took no part in public affairs, and population, apent their lives in contemplation. They adopted celibacy, and had no individual property. In matters of belief they held the Scriptures in the highest reverence, interpreting it, however, by an allegorical system of their own they believed also in the immortality of the soul. Out of Raseniam, in the stage of Sabæism, resulted Islamism, in the full development of whose tenets and practices several of the principal

rites of the Essenes are preserved.

ESSENTIAL OILS, es-sen'-skil (Lat. essentialis), in Chem., a term applied to the odorous principles of plants. They are also called volatile oils, to distinguish them from the fixed oils. Chemically speaking, they are either hydrocarbonsor oxidized hydrocarbons, they are either hydrocarbonsor oxidized hydrocarbons, and oils containing sulphur. They are extracted from different parts of plants, some plants yielding two different essential oils. Thus the orange yields two distinct essential oils, one from the flower, the other from the peel of the fruit. They are prepared in different ways, either by enfleurage, by pressure, or by being distilled with water. The principal use of essential oils is in perfumery; but certain of them are used for flavouring, and in medicine. It would be impossible to give even a summary of the almost infinite number to give even a summary of the almost infinite number of essential oils: if the reader is curious on the subject. he may find a great deal of valuable information respecting them in Piesse's "Art of Perfumery." 3rd edition.

ESSOIGN, es-soin' (old Fr. essonier, to excuse), in aw, denotes an excuse for him that is summoned to appear and answer to an action, or to perform suit to a court baron, &c., by reason of sickness, infirmity, or other just cause of absence. A party might essoign himself three times by sending a substitute to explain the reason of his non-appearance. Formerly the first return in overy term was, properly speaking, the first day in that term, and was usually called the esseign day of the term, as on that day the court eat to take casoigns or excuses for such as did not appear according to the summons of the writ. Esseigns are now rarely resorted to, and are almost unknown in prac-

ESTABLISHED CHURCH, es-tab'-lishd (Fr. établir, to fix firmly), is a church established and maintained by a state for teaching religion in a particular form. History shows that in almost all nations an intimate connection has been maintained between religion and the nection has been maintained between religion and the civil government. In Greece, in Rome, among the ancient Druids, or the modern Chinese or Japanese, thesame thing is evident; the Church gives its support to the State, and the State gives its protection to the Church. The government established among the ancient Jews was a theoreacy, and among the Mohammedans, the Koran may be said to-comprise both the civil code and the religious creed of the people. Hence, perhaps, the idea of an established religion is to be sought for in the inner nature of man. The subject. sought for in the inner nature of man. The subject, however, is one which has been very much discussed, and on which much diversity of opinion exists. In the New Testament there is nothing laid down on this sub-ject; yet, from the stress that is laid upon respect for civil governments, some have drawn an argument in favour of establishments. In the early ages of Christianity, the Church was a stranger to any alliance with the civil powers; but, subsequently, the connection between the two became very intimate; and to this cause may be attributed most of the errors into which the Church fell. These, at length, became so great and manifest as to lead to the Reformation. When the Protestant states separated from the Church of Rome, each set itself to establish a Protestant church of its own, in itself to establish a Protestant church of 118 0wn, m conformity with certain prescribed tenets, which were frequently, also, enforced upon others. In England, as well as in other countries, the measures concted against non-conformity and dissent were very oppressive; but these have, from time to time, been abolished, and now dissenters, in this country, may be said to enjoy nearly all the privileges that are compatible with an established church. (See DISSENTERS.) The great objection to an establishment arises from its tendency to suppress freedom of opinion, and to pre-scribe in what men's consciences ought to be the sole guide. In some of the continental countries this is attempted to be remedied by the State granting en-

dowments to all of the more important of the Christian sects. In favour of church establishments is alleged the necessity that there is for a state to preserve and communicate religious knowledge. It is argued that the knowledge and profession of Christianity canno be upheld without a dergy; that a clergy cannot be supported without a legal provision; and that a legal supported without a legal provision; and that a legal provision for the clergy cannot be constituted without the preference of one sect of Christiaus to the rest. The endowments of the established church in this country are not strictly derived from the State, which, indeed, has rather robbed than enriched it, but were chiefly bestowed by individual liberality to the Church in early times, and were transferred to the Anglo-Catholic Church at the time of the Reformation, though the right of appropriating them to one particular sect,

when there are so many others, may be questioned. ESTATE, es-tait' (Fr. etat, Lat. status), in Law, is that title or interest which a man has in lands, tenements. or hereditaments, and is the condition or circumstance in which an owner stands with regard to his property. The leading distinction to which estates are subject is that of legal and equitable, the first being properly cognizable in the courts of common law, though noticed also in those of equity, and the second being properly cognizable only in the latter courts. A legal estate is usually considered in a threefold point of view : (1) With regard to the quantity of interest which the tenant has in the tenement; (2) with regard to the time at which that quantity of interest is to be enjoyed; and (3) with regard to the number and connection of the tenants. As to quantity of interest, estates are either freehold or less than freehold. Freehold estates, again, are divided into freeholds of inheritance and freeholds not of inheritance. Of estates less than free hold there are three kinds: (1) Estates for years; (2) estates at will; and (3) estates by sufferance. Besides these several divisions of estates in point of interest, there are what are called estates upon condition,—those whose existence depends upon the happening or whose existence depends upon the happening or not happening of some uncertain event. They are of two kinds,—estates upon conditions implied, and estates upon conditions expressed. As regards the time of their enjoyment, estates are either in posses-sion or in expectancy. Of expectancies, there are at common law two sorts,—one called a reversion, the other a remainder. With reference to the number of persons entitled to the enjoyment, estates may be in severalty, joint tenancy, coparcenary, common, entireties

ESTATES OF THE REALM .- The three estates of the realm are the three branches of the legislature,—the lords spiritual, the lords temporal, and the commons.

Esting, Book or, est-ther, is one of the historical books of the Old Testament, placed after that of Nehemiah. It contains the history of a Jewish maiden, by name Esther, who became the wife of the Persian king Ahasuerus. As to the authorship of the book, nothing is with certainty known, nor are there any data on which to form a reasonable conjecture. By some it has been ascribed to Mordeon, by others to Ezra, or the high priest Joschim; but, in any case it appears to have been written soon after the events which it narrates had taken place; and it has this peculiarity, that the name of God does not once occur in the whole book. The difficulties regarding the authenticity of this book have been much exaggerated. It has always been received as canonical by the Jews and regarded as one of the most precious portions of their sacred scriptures. Some difference of opinion exists as to what Persian monarch is referred to crists as to what Persian monarch is referred to under the name of Ahasuerus; but the probability seems to be in favour of Kernes. The entire narrative corresponds with what we know of the manners and customs of the Persian court, and of oriental orneity; while the origin of the feast of Purim shows very clearly that the occasion thereunto must have occurred in Jewish history. In the Septuagint there are a number of additions and details in this book, which Jerome, in the Vulgate, placed at the end of the book, and Luther in the Apocryphs. That these additions an spurious there can be little doubt. Esroperul, es-tep-pel (Fr. estoupir), in Law, is an impediment or bar of action arising from a man'r own act. Estoppels are of three kinds:—(1) By matter

of record, as where a judgment has been given in a court of record, the parties to the suit are estopped from afterwards alleging matters which would be confrom atterwards alleging matters which would be contradictory to the record; (2) by deed or matter of writing, no person being allowed to dispute his own solemn deed, which is therefore conclusive against him and those claiming under him, even as to the facts recited in it; and (3) by matter in pais (in the country), that is, by transactions between the parties not evidenced by record or writing; as livery, entry, &c. The principle of estoppel is, that what a man has once solemnly alleged, he should not be afterwards suffared to contradict. suffered to contradict.

ESTOVERS, es-to'-verz (Fr. estoffer, to furnish), in Law, is the liberty which the owner of an estate for life or a tenant for years has of taking a necessary supply of wood from the estate for the use or furnisupply or wood from the estate for the use or furni-ture of his house or farm. The Saxon word bote is used in the same sense; and therefore house-bote is a sufficient allowance of wood to repair or to burn in the house; plough and cart bote are for making and repairing instruments of husbandry; and hay or hedge bote is for repairing hays or hedges. These botes must be reasonable, and if a tenant takes more than is needful for these purposes, he may be punished for waste. for waste.

ESTRAYS, es-traiz' (Nor. estrayer), in Law, are such valuable tame animals as are found wandering in any manor or lordship, the owner of them being unknown. manor or foreignp, the owner of them being unknown. The law gives them to the king, as general owner of the soil; but they are most commonly given by special grant from the crown to the lord of the manor. In order to become absolute property, they must be proclaimed in the parish church and two market-towns. next adjoining to the place where they were found; and if not claimed within a year and a day, they belong

to the king or his substitute. ESTREAT, es-treet' (Lat. extractum), is a true copy INTERAT, esercer (Lat. extractum), is a true copy or note of some original writing or record, and especially of fines or amercements, entered on the rolls of a court to be levied by a bailiff or other officer. When recognizances are taken, as for appearance to prosecute or give evidence in cases of felony or misdesecute or give evidence in cases of reconjulances be broken, the recognizance becomes forfeited; and being extreated, or extracted, and sent up to the Exchequer, the party and his sureties, having now become the king's absolute debtors, are sued for the several sums in which they are respectively bound. The barons of the Exchequer have power to discharge, mitigate, or compound estreated recognizances and forfeitures, except such as are incurred before justices of the peace.

ceps such as are incurred octore justices of the practice. Estuary, cs-th-are (Lst. extuarism), is a term in Geog. which was originally applied to any bay, creek, frith, or arm of the sea, in which the tide cheed and flowed (Phiny, Epist. lib. 9, ep. 33); it is now used, however, to denominate those parts of river channels which are constitutions to the account of the continuous to which are contiguous to the sea or ocean in which the water is salt or brackish. For the term estuary to be rightly applied, the ebb and flow of the tide must be distinctly perceptible, and there must be little or no current. In the British isles the estuary of the Humber is the largest.

Humber is the largest.

Ethno, e-te-re-o (Gr. etaireia, society), in Bot., a kind of fruit, examples of which are afforded by the strawberry, ranunculus, and Adonis. When the achenia (see ACHENIUM) borne by a single flower are so numerous that they form more than a single whorl or series, they constitute collectively an eterio. In the anumerous and Adonis the achenia are placed on a series, they constitute collectively an eteric. In the rannuculus and Adonis, the achmin are placed on a convex thalamus of a dry nature; in the strawberry they are placed upon a fleshy thalamus. The so-called seeds of the strawberry are in reality so many separate achmin; while the part to which the strawberry owes its value as a fruit is merely the succulent thalamus. In the fruit of the rose, the achienia, instead of being placed on an elevated thelamus, are situated upon a concave one, to which the calvx is attached. This modification of the ordinary etserio is regarded as a distinct fruit by some botanists, who have distinguished it by the name of Cynnarhodum. In the raspberry and blackberry, a kind of eterio is formed of a number of little drupes or drupels, crowded together upon a dry thalamus.

ET CATERA, et-set'-e-ra, a Latin phrase, which kas

### Etching

become thoroughly Anglicised. It is usually written fc., and means and so on, and so forth. As an abbreviation it is of great use in writing.

ETCHING. (See ENGRAVING and ELECTRO-ETCH-

ETCHING UPON GLASS. (See GLASS.)

ETRINITY, e-ter'-ne-te (Lat. aternitas), an attribute of the Deity, the existence of whom, according to the true principles of religion, is without beginning or end. It is a negative idea clothed with a positive name. To whatever it is applied, it supposes a present existence, and it is the negation or denial of any beginning or end to that self-same state of existence. As applied to the to that self-same state of existence. As applied to the Deity, it has not been controverted by those who seknowledge a deity at all. On the common basis of argumentative philosophy, there never could have been a time when nothing ever existed, as assuredly that state of nothing impulpable must necessarily have continued up to the present time. In strictness, however, we have nothing to do with duration prior to that of the visible world; it is sufficient for us to know that the contriver existed before his handiwork. Eterity have the property being influite, is inconceivable by our fluits unity being influite, is inconceivable by our fluits unnity being influite, is inconceivable by our finite un-derstandings; at the same time, we cannot imagine an infinite being to exist without it. There is a distinction made between an anterior and a posterior eternity; the latter belongs to beings whom God pro-

eternity; the latter belongs to beings whom cod pro-poses to preserve for ever, the former to himself alone.

—Ref. Paley's Natural Theology.

ETHAL, e'-that (formed from the first syllables of ether and alcohol), in Chem.—When spermaceti is saponified, it yields ethal instead of giveerine, as is the case with the ordinary fats. It is a white solid, fusi-ble at 118° Fahr., and soluble in alcohol, crystallizing in plates as it cools. It possesses the constitution and properties of a true sloohol, and stands in the same relation to pulmitic acid that ordinary vinous alcohol does to acctic acid.

does to acetic acid.

ETHER, ê-ther (Lat. ather), in Chem.—Ether is used as a generic term to denote a series of organic bodies having the general formula Hn.+1(OnHn+1)O. They are looked upon as being derived from corresponding alcohols by the abstraction of one equivalent of water; or, in other words, they are regarded as the oxide of a radicle represented by the formula within the brackets, of which their alcohols are the hydrated oxides. This theory has undergone a modification of the years the theory has undergone a modification of late years, the followers of Gerhardt laying it down as a principle that the equivalent of an other when existing alone is double, and that its compounds are formed by substitution. There are strong reasons in support of this theory, as will be seen when we consider the double and compound ethers. Ethers are subdivided into,-1. Simple ethers, of which ordinary vinous ether may be taken as a type  $(C_aH_aO)$ ; 2. the double ethers, which consist of two equivalents of different ethers united, as the methyl-ethylic ether  $(C_aH_aO,C_aH_aO)$ ; and the comments of the ether of methyl-ethylic ether (C,H<sub>2</sub>O,C,H<sub>3</sub>O); and the compound ethers, which contain an equivalent of an ether united to an equivalent of an acid or halogen, and correspond to saits; thus nitric ether is C,H<sub>2</sub>O,NO<sub>5</sub>; hydrochloric ether, C<sub>2</sub>H<sub>3</sub>Cl. From the formulae given of the double and compound ethers, it will be seen that they may be considered as double atoms of the original ether, in which one atom is replaced by another ether in one case, and by an anhydrous acid or a halogen in the other. In common parlance, ether is generally taken to mean the ordinary sulphuric ether, as it is improperly termed, from being obtained from alcohol by the action of sulphuric acid. Pure ether is an extremely limpid, colourless, transparent ether is an extremely limpid, colourless, transparent fluid, very volatile, and refracting light with great power. Its colour is peculiarly powerful and penetrating if inhaled; at first producing exhibitation, and fiterwards stimulating effects, followed by insensibility to pain. Its use as an annesthetic has been superseded by chloroform. It has a specific gravity of 0.721 at 55° Fahr., and boils at 94.8° Fahr. It is used for producing cold artificially by rapid evaporation. Its upour is extremely dense, sinking heavily in air; great care should therefore be taken not, to pour it out with a flame below it: otherschean explosion of a dangerous a flame below it; otherwise an explosion of a dangerous character might ensue. Mixed with certain propor-

#### Ethics

cial application is as a solvent for pyroxylin in the manufacture of collodion. In analysis it is used as a solvent for fats. Ether was formerly prepared by mixing two parts of alcohol and one of sniphuric acid, and heating the mixture in a retort until it began to mixing two parts of anoma and the string the mixture in a retort until it began to blacken; a quantity of alcohol, equal to half that used, was added to the mixture, and the distillation continued as long as the ether distilled over. The process of Boullay, or the continuous process, as it is termed, is now generally used. Equal measures of alcohol and sulphurio acid are heated in a capacious retort, which is connected with a reservoir of alcohol in such a munuer that, as fast as the ether distils off, a corresponding amount of alcohol makes up the deficiency. The process cess is continued until thirty times the original amount of alcohol is used, the sulphuric acid acting over and over again as the agent by which an equivalent of water is abstracted from an equivalent of alcohol.

water is assirated from an equivalent of alcohol. (See Etheristication.)

Etheristication, e-ther-if-e-kai'-shun, in Chem.—
The process by which the same amount of sulphuric acid serves continuously for the abstraction of an equiacid serves continuously for the abstraction of an equivalent of water from an almost indefinite number of equivalents of alcohol, has been much discussed amongst chemists. Numerous researches have been made on the subject by Liebig, Mitscherlich, Graham, and others, and the general explanation arrived at is that the sulphuric acid unites with the alcohol to form sulphethylic acid and water. The sulphethylic acid then splits up into ether, which distils over, and sul-phuric acid, which again unites with the alcohol to form a second portion of sulphethylic acid, which in its turn decomposed. The great difficulty in admitting this view arises from the circumstance that sulphethylie acid should be first formed and then immediately decomposed, under precisely similar circumstances of temperature. Mitecherlich and Graham consider that the sulphuric acid acts in a calalytic maner, simply inducing composition in other bodies by its pressure, somewhat in the manner of a ferment.—For a fuller discussion of this very interesting subject, the reader is referred to Miller's "Elements of Chemistry," vol. iii. 3rd edition.

ETHICS, vol. in. ord edition.

ETHICS, eth'-isk Gr. ethica, from ethics; Lat. mos, mores, manners, or moral conduct), signifies, strictly, both in ancient and in modern speech, the doctrine of morals. This branch of knowledge has been divided by modern writers into two parts, the one comprehending the theory of moral science, and the other its practical doctrines. On the former side the first part investigates that principle of our constitution by which we are led to form the notion of moral distinwhich we are not form the notion of moral manni-tions; and on the laster side it inquires into the proper object of moral approbation. In other words, this science endeavours to give an answer to the ques-tion.—Is it by the same faculty that perceives the existence of truth and falsehood in other departments. of knowledge, or by a peculiar power of moral percep-tion, which is pleased with one set of qualities and displeased with another, on which the peculiar obli-gation of moral conduct is founded? What is the common quality or qualities, in short, belonging to all the different forms of virtue? Is it benevolence,—is it sympathy,—is it a rational self-love? Thus the scope of the one question is to ascertain the origin of our moral ideas; that of the other to refer the various moral phenomena to their most simple and general laws. Again, the practical doctrines of morality com-prehend the rules formed to direct human conduct, and the best means of compassing this general end. These two questions, when properly treated, seem to exhaust the entire theory of morals. Ethics, then, is a word which shall be employed in the succeeding article as altogether synonymous with moral philosophy. One of its best and latest German expounders observes, "The best name for this science is Ethic, orderves. The nest name for this science is lethic, or doctrine of morals, as is clear from the relation of this word to the three fundamental conceptions of morals,—law or duty, virtue, and chief good."

Bihics, or morals, has properly to do with action rather than with thought; and hence the name of the active remess that Reid and Stawart have supplied in their character might ensue. Mixed with certain propor-tions of sir, it forms a highly-explosive compound. It dissolves readily in alcohol, but very sparingly in water. action belongs exclusively to morals and not also to It is much used in medicine; buttis principal commer-the intellectual faculties; but that it belongs more 794

obtrusively and overfly to this department than it does to the other. Action in general is twofold: it is either instinctive and constitutional, as hunger, thirst, and the love of sex; or it is voluntary and designed, as the love of sex; or it is voluntary and designed, as when men pursue a course of ambition, or spend a long life in the endeavour to master some department of knowledge. Of those two lines of action, one is necessary, compulsory, and absolute while it lasts; while the other is contingent, voluntary, and relative. I may resist the strong urgings of ambition or of glory; but I cannot resist the demands of hunger. It is at the choice of Napoleon whether he laws Elba or no sthough it is quite necessary that hunger. It is at the choice of Napoleon whether he leave Elba or no, although it is quite necessary that he should have his breakfast on that inauspicious the while the one class of morning. It thus appears, that while the one class of actions is necessary to our existence, the other actions is necessary to our existence, the other is by no means necessary; and many persons would be all the happier to resist those urgent longings which besirge their wills and often carry them captive. Another consequence follows from this consideration, which it is all-important to note on the present occasion,—that it depends altogether on whether the will of man be consciously free, as to whether his acts can carry with them any moral responsibility. If a stone accidentally falls on my head and materially injures me, I do not blame the stone, I simply lay the charge on my own suit fortune. If I am bitten assured by my neighbour's doe. I may pronounce the severely by my neighbour's dog, I may pronounce the dog dangerous to the lieges, I cannot hold him guilty of assault. But if I am knocked down and robbed by of assault to have him up before the magistrate and punished; for unless he be an imbedile or a madman, he cannot tor unless he be an innectic or a medinan, he cannot set up a plea of moral incompetence, which everybody would arge in favour of the previous cases. Nor am I responsible for an act performed by me while I was under moral or physical compulsion; for by being so constrained, my will, my voluntary guiding power, is deprived of its accustomed freedom, and I am no longer at liberty to act as I please. It hence appears that for all practical moral purposes, the will must be consciously free, otherwise there can be no responsibility. (See Ferenom and Necessity.) And not only so; the other faculties, which always go to aid the moral jndgment in pronouncing its awards, must be in a normally healthy condition, otherwise no meral blame is attachable to a vicious act more than to a virtuous one. Were our law courts capable of publicly recognizing the more delicate shades of character and of guilt that frequently come before them for judgment, and were human nature better able to appreciate the finer traits and more delicate lineaappreciate the inner traits and more delicate linear-ments of men's dispositions, there can be little doubt that our civil and criminal codes would experience an entire modification of their peculiar rigour against peculiar offences and crimes often committed with but little moral cogitation and with but little moral crift. For how often are men's passions at these whomguilt. For how often are men's passions strong where their moral perception is not of the highest! And when malevolent emotions become heated, do they on the bind men's minds to every other consideration but what this wicked passion points them to? Then the history of the growth and formation of human character is nearly a terra incognita, and such should always be taken into account in anything approaching a perfect code of moral, or even of criminal law. Whatever is calculated to shake or to confirm the will in it moral, andeavour is calculated. confirm the will in its moral endeavours, is calculated to shake or to confirm the comparative perfection of the moral character. With the view, accordingly, of the moral character. With the view, accordingly, of ascertaining and of classifying the various sources of our activity, various ethical inquirers have analyzed our various propensities into nearly the following principles:—1. There are our appetites of hunger, thirst, and sex, which take their rise from the body, and which ally us with the brutes. To those natural appetites belong the acquired ones; such as the liking for tobacco and other parceties, and for in-

desire for wealth, for dress, for equipage, for retinue, and for furniture, which are all readily explainable on the principle of association.—3. Then there are the affections, or those active principles whose direct and ultimate object is the communication of pleasure or of pain to any of our fellow-creatures. These are distinguished, according to their tendency, into benevolent and malevolent affections. To the former class belong the parental and the filial emotions,—those of kindred, the parents and the man emotions,—more of situated, love, friendship, patriotism, universal benevolence, pity, gratitude, &c. It is to be remarked, regarding those affections, that this classification is simply offered from its convenience, not from its being exhaustive. There is one peculiarity observable with respect to there is one peculiarity observable with respect to these emotions, that, accompanied as they all are with exquisite pleasure, they have, nevertheless, nothing selfish in their origin. This has been fully demon-strated by many writers. It is a remark of Bishop Butler, that the final cause of so much agreeable emotion connected with the exercise of benevolence is, in all likelihood, meant to induce us to cultivate with peculiar care a class of our active principles so immedutely subservient to the happiness of human society.
Our malevolent pass, ms, or affections, are usually distributed into hatred, jealousy, envy, revenge, and some kinds of resentment. As the former class of affections are always accompanied with pleasant emotions, so the malevolent ones are invariably attended by disagreeable ones. It is obvious from this, that the latter are only ones. It is obvious from the that the latter are only to be used with a great degree of caution, and on no occasion in greater intensity than the urgent necessities of the case demand. They are like those poisonous cures that are sometimes administered to us to restore our frames to their accustomed health. If the prescribed dose be overstepped, the chances are that must atone for our rashness with our lives. Such would be the constitution of man, were no inheritance of reason or of conscience to fall to his share. Reason, however, renders the nature of man altogether different from what it would otherwise be. It is by this faculty, in its multifarious forms, that man is capable of availing himself fully of his past experience in avoiding those temporary pleasures that he knows will be suc-ceeded by a corresponding suffering, and in submitting to those lesser ills of life which he knows will ultimately minister to a greater accession of good. In a word, he can form that more enlarged and liberal idea of happiness with which every cultivated man is acquainted, ness with which every cultivated man is acquainted, and be can deliberate about the best means of attaining to this wished-for goal. It is impossible to pronounce the word happiness in the hearing of any man without at the same time enkindling in his mind various ideas, more or less attainable, of an exceedingly desirable object.—4. Self-love, accordingly, or that species of desire which longs for personal happiness as an end in itself, is a rational principle of our nature, altrogether legitimate and presiseworthy when ness as an end in resen, is a radonal principle of our nature, altogether legitimate and praiseworthy when kept in its own place. The pursuit of one's interest in an enlightened way is perfectly lawful as an ethical end; it only becomes unlawful when, by its excess, it shuts out that essentially higher principle which men have variously termed the moral faculty, the moral sense, the conscience. Self-interest, or self-love, differs from selfishness, which always indicates a peculiarly low and vulgar state of character, which is only content with the perpetual gratification of a morbid sensuality. This enlightened regard to our own interest was, by many of the ancient philosophers, regarded as the whole of virtue, and they thought they had accomplished the duties of sages when they had nau accomplished the duties of sages when they had had down rules, of more or less particularity, for the attainment of this "supreme good," this summum bonum. Nor is it to be wondered at, that they placed the whole of virtue in this prudential self-regard; for the two principles—that of self-interest and of the moral founds. thirst, and sex, which take their rise from the body, and which ally us with the brutes. To those natural appetites belong the acquired ones; such as the liking for tobacco and other narcotics, and for intoxicating drinks. All stimulants are of this class.—2. There are the desires, which may be conveniently distributed into the desire for knowledge (curiosity), the desire of society, the desire of seaseem, the desire of intoxicating drinks, the desire of seaseem, the desire of society, the desire of seaseem, the desire of intoxicating drinks, the desire of seaseem, the desire of into experience that we learn the connection of virtue and happiness; and hence virtue, the cause, must certainly precede the existence of self-love, as the effect. The emptions which accompany the two principles differ both in degree and in kind. This may be readily established by any one at all acquainted

with what takes place in our public theatres. The audience here, from the enthusiasm of their combined judgment, impress one more forcibly than any amount of individual talking. And accordingly, the slightest throad of pure morality which the dramatist contrives to weave into his piece, at certain stages of the action, raises the passions of the crowd into transports, and forces tears from grave, sensible men. In all languages, the words employed to denote the ideas of duty and of interest are distinct. The to kalos and the kathekon of the Greeks, and the konestum and utile of the Latins, express exactly what we mean when we speak of duty and of interest. A similar conclusion likewise finds countonsoe in the early period at which speak of duty and of interest. A similar conclusion likewise finds countonsace in the early period at which our moral judgments make their appearance, it being always a considerable while before it is possible that we should be capable of forming the general notion of our own happiness. To escape the force of some of the foregoing arguments, it has been alleged that this notion of right and wrong, as a separate existence in human nature, was first of all discovered by philosophers and politicians, and the influence of education has effected the rest on the growing mind of the race. Now education is no doubt a powerful instrument; but there is no example on record that can be pointed to to illustrate the case of a new creation being to to illustrate the case of a new creation being implanted in men's minds by means of this potent organon of culture. No doubt sufficient allowance must be made for the different circumstances of mankind in different periods of society, and for the diversity of their speculative opinions, as well as for the different moral significance of the same action, per-formed under different systems of external behaviour. But while education may, and does, in this way modify in important respects the moral sentiments of mankind, as well as their opinions regarding the beautiful and the sublime, we would be far from maintaining that it can effect such wonders as to create our notions of right and wrong, or our sesthetical ideas. Now, lest there should still linger in some men's minds a hesitation to accept of this ethical principle as contrasted with self-regard, we beg to refer to a very weighty sentence of Bishop Butler's on the subject, as calculated, so far as any historical authority can be so, to carry persuasion to the most wavering mind. This singularly able moralist says, in his second dissertation on "the Nature of Virtue," "For as much talk has been disputed wherein virtue consists, or whatever ground for doubt there may be about particulars, yet in general there is in reality a universally acknowledged standard of it. It is that which all ages and all countries have made profession of in public,—it is that which every man you meet puts on the show of, it can effect such wonders as to create our notions of that which every man you meet puts on the show of,— it is that which the primary and fundamental laws of all civil constitutions over the face of the earth make all civil constitutions over the face of the carti make it their business and endeavour to enforce the practice of upon mankind; namely, justice, veracity, and regard to common good." Having now vindicated the fact of moral perception as an essential part of the human constitution, the next question that demands our attention is the foundation and the formation of this distriction.

a feeling, or as a judgment, that this fact of ethical a feeling, or as a judgment, that the fact of ethical appreciation is experienced, or is it something different from all these? While many wise and great men have argued on all of these sides, it becomes a moralist of the present day to proceed with cantion. The truth is, that the act is somewhat Protean in its complexion. Now that one looks at it through hard, metallic intellectual glasses, the phenomenon turns up as determined an outline as a sum in arithmetic could; again that we view it through the somewhat hazy medium of emotion, it looms as large and palpuble as the renowned "bogle" of the Brocken. And if a half renowned "bogle" of the Brocken. And if a half sceptical and rather clumey analyst takes the fact between his fingers, the chances are that, like the sand on the sea-shore, it will crumble through insensibly, and leave nothing behind. Still, the fact of the rightness and wrongness of actions remains to be accounted for; and unless we make the faculty an indistinguishable compound of reason and feeling, it is hard to say what other equally unobjectionable analysis of it can be offered.—2. Of the emotions excited by the contamplation of moved heavity and deformity by the contemplation of moral beauty and deformity, some are necessarily pleasurable, others are necessarily painful. Those qualities in good actions which excite agreeable emotions in the observer, form what some moralists are inclined to call the beauty of virtue, and the opposite feelings, as the deformity of vice. The emotions thus arising from the observation of moral beauty and of moral deformity are so much more exquisite in their agreeableness, as well as more harrowing in the pain they bring with them, than any that arise from the perception of material forms, that the Socratic school used to aver that the literal signification of the words beauty and sublimity arose primarily from the perception of the qualities of mind. (See BRAUTY.)-3. When a virtuous action has been performed in our When a virtuous action has been performed in our presence, we cannot check our benevolent affections from going forth in its behalf; and if we attempt to do it, it is most likely to be at the expense of our own peace of mind. When, again, we witness an act of cruelty, of selfishness, of oppression, of decoption, of cunning, we are inspired by a feeling of extreme hostility toward the delinquent, and can hardly restrain our indication from heading forth against him. In our indignation from breaking forth against him. In our own particular case, if we can occasionally approve of our conduct to the extent of looking forward with confidence to the approbation of a higher tribunal, the connuence to the approparion of a nigher virtual, the sense of ill-desert, on the other hand, is usually so absorbing as often almost to destroy this just anti-cipation of future reward in us. While our sense of the merit and demerit of actions must impress us anew with a sense of the intimate connection between virtue and happiness, yet we are not to suppose that always, when we have done well, prosperity will attend us as a matter of course. It takes a man of sense, nay of wisdom, to acquiesce calmly in the lot that Providence, in its inscrutable ways, has assigned to him. It is a vulgar error to expect that good or evil fortune always accomments in strend lines are good and avil extints. of upon mankind; hamely, justice, veracity, and regard to common good." Having now vindicated the fact of moral perception as an essential part of the human constitution, the next question that demands our attention is the foundation and the formation of this distinction. One class of moral theorists leans to the emotional or subjective view of the origin of our ethical judgments, another class patronizes the intellectual or objective view, while a third class is of opinion that moral laws owe their origin entirely to theoretic legislation. As this distinction cannot be entered an here, some account will be found in the article Conscience of the different opinions maintained respecting the origin of the moral faculty of the chief writers who have treated of this question throughout the history of the world. In analyzing the good or badactionsperformed by others, or even when we need to one own minds when we do some commendable action or are guilty of some reprehensible one, are we not conscions of the following things?—1. The appreciation of a certain rightness in actions. 2. A feeling of satisfaction, or the opposite, varying in degree according to the delicacy of our moral sensibility.

3. The appreciation of the merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit of the agent. 4. The idea of merit or demerit or demerit o implies, in the last remove, the idea of human duty. As Butler says, it is the violation of a known obligation that renders man obnerious to pushment, it is not his foreknowledge at the certainty of that punishment. We accordingly conclude that the moral faculty is essentially different from all other powers of the mind; and while the slightest violation of its authority fills us with removes, the greater our sacrifices in its behalf fill us with unspeakable satisfaction and triumph. Human duties are ordinarily divided into those relating to the Daity, to ourselves, and to others. Respecting the first, see Natural Tenology. — Ref. Butler's Bermons; Sir James Mackintosh's Ethical Dissertation; Reidla Active Powers; Stewart's Active and Moral Powers; Dr. Thos. Brown's Lectures on the Philosophy of the Human Mind; Kant's Metaphysic of Ethic; Fichte's Destination of Man; Dorner's Lectures on the Scotlish School; Jonfrey's Ethica, &c. ETHIOTIC ACID, e-the-ow'-id, in Chem.—When olefant gas is combined with anhydrous sulphuric acid, which speedly deliquease in the arm in the air ciring vias.

which speedily deliquesce in the air, giving rise to ethionic soid. ETHIOF'S MINERAL, ethe-ops, in Chem. (H.S.), sub-sulphide of mercury. It is obtained as a black powder by transmitting a current of sulphuretted hydrogen through a solution of a mercurial subsalt, or by tritu-

white milky crystals of ethionic anhydride are formed,

rating 18 parts of moist sulphur with 200 of mercury.
ETHNOID BONE, eth'-moid (Gr. ethmoides, from eth ETHNOTO BOTH, eth'-moid (Gr. ethmoides, from ethmos, a sieve), in Anat., is one of the bones of the head, which is exceedingly light and spongy, consisting of many convoluted plates, which form a network like a honeycomb. It is somewhat cubical in form, and is situated between the two orbitary processes of the frontal bone, at the root of the nose. The olfactory nerves shoot down through the numerous small perforations of this bone to the organ of smell.

ETHNOGENETH, eth-nog-re-fe (Gr. ethnos, a nation, and graphe, description), is that science which treats of the manners, custome, religion, forms of government, and other peculiarities of different nations, and which is commonly regarded and treated as a branch of convent accounts.

of general seography.

ETHNOLOGY, etk-nol'-o-js (Gr. ethnos, nation, and logos, discourse), is that science which treats of the varieties [of the human race, their history and disvarieties (of the human race, their history and dis-tribution, their languages, physical and mental charac-teristics; arranging and classifying them, noting their points of similarity or dissemblance, and having in view the difficult problem of the unity or non-unity of the human race. "The chief ethnological problems," the human race. "The chief ethnological problems," says Dr. Latham, "generally expressed, are those of (1) the unity or non-unity, (2) the geographical origin or origins, (3) the antiquity, and (4) the futurity of mankind,—questions all closely connected with each other with the chief of th 797

of ethnology is of very recent origin, and is still in a very imperiect state. On the great question of the of emissions is a very recent origin, and is suit in a very imperient state. On the great question of the unity or diversity of the race, ethnologists are divided into two great schools. Of the one the representatives may be said to be Prichard and Latham, in England; of the other, Morton and Agassiz, in America. Peter Camper, a distinguished Dutch anatomist of the last Camper, a distinguished Dutch anatemist of the last century, was the first who attempted to lay down on scientific principles a method of distinguishing be-tween the different races of mankind, from the form and aize of the skull, by what is known as the facial angle. The head being viewed in profile, a line is drawn through the meatus auditories of the ear to the base of the nose, meeting another toushing the most prominent part of the osure of the forehead, and falling down to the most advanced portion of the upper jaw. The nearer the angle thus formed approaches a faming down to the hose angle thus formed approaches a right angle the greater, as a general rule, is the intellectual development of the individual; and this is found to be generally the case, not only as regards than, but also among the lower animals,—the smaller the facial angle the lower are they in the scale of intelligence. One great objection to this method was the lower animals are count only one feature of the skull; intelligence. One great objection to this method was its taking into account only one feature of the skull; to remedy this, Blumenbach fixed upon a number of characteristic peculiarities; and to him we owe the division of mankind into the five following classes:—(1) the Caucasiau, (2) Mongolian, (3) Ethiopian, (4) American, (5) Malay. Cavier reduced the five classes of Blumenbach to three,—the Caucasian, Mongolian, and Ethiopian, treating the Malay and American as subdivisions of the Mongolian. He referred the original sents of the human race to the mountain-chains,—the Caucasian to Mount Caucasus, the Mongolian to the Altai mountains, and the Negro to the chain of —the Caucasian to Mount Caucasas, the Mongolian to the Altai mountains, and the Negro to the chain of the Altai. Dr. Prichard, who was the first that brought to the study of this subject a large knowledge of languages as well as of physiology, regards the banks of the great rivers, and not the mountains, as the primary seats of the different races. "The cradles, or nurseries, of the first nations." he says, "seem to have been extensive plains or valleys, traversed by navigable channels and irrigated by personnal and fertilizing streams. Three such regions were the accesses tilizing streams. Three such regions were the scenes of the earliest civilization of the human race." "In one of these the Semitic or Syro-Arabian nations ex-changed the simple habits of wandering shepherds for the splendour and luxury of Nineveh and Babylon. In a second the Indo-European or Japetic people brought to perfection the most elaborate of human dialects, destined to become in after-times, and under different destined to become in after-times, and under different modifications, the mother tongue of the nations of Europe. In a third, the land of Ham, watered by the Nile, were invented hieroglyphical literature and the arts, in which Egypt far surpassed all the rest of the world in the earlier ages of history." These three divisions do not correspond to the three indicated by the form of the skull, which he makes the swage or hunting tribs, the numerical convenience tribs. or origina, (3) the antiquity, and (4) the futurity of mankind,—questions all closely connected with each other, and all mutually illustrative of each other; questions to which the phenomens of classification and the several ethnological methods are subordinate." Ethnology differs from authropology in that the latter deals with the relations of man to the other members of the animal kingdom, whereas the former regards the differences that exist among the different varieties of the human race. The latter requires only a single pair for its study, the former presupposes variety of races; and the greater the variety the further its boundaries attend. It partities of history, but, unlike ordinary history, which deals with actions, it treats of the effects of physical agencies upon man,—soil, climate, nutrition, and the like; going back to a period long anterior to the existence of written records, and, unlike history, arguing from affects to causes, from the known to the unknown. In this way ethnology is the standy of chimology, as well as physical geography, so the satisface of languages; and physical geography, so the satisface of languages; and physical geography, so the satisface of languages; the satisface of physical influences upon differentiases. The satence of history in the first of these has been added thus not a proposition of the skull, which he makes the base of each other; divisions do not correspond to the first of the scale partitions of the luman family. In the first of these the calls proposition of the luman family. In the first of the scale partitions of the luman family. In the first of the scale partitions of the luman family. In the first of the sate many the fact, and what he terms pyracidia scale is what he calls proposition of the luman family. In the first of the luman family. In the first of the luman family. In the first

Ethnology 4 French anatomist reported as the model of perfection, and at the same time the probating of the human family. This were is insulational analysis of the human family. This were is freely the property of the second group are time highlighted or Hamilton, reporting ever in inturban ness and wealth on their own rish and. This third group is the Indo-European, Japetin, or Arisis rees, promprising the Hindoos, Permising Algham, Reports, Armentans, and the nations of Khinope, with their larger to clonies. "The physical differences between all these nations, though no little the probability are not greater than nost persons will think sufficiently explained by reference to climate and to-diversity of food and of manners." The great central region of High Asis is this bitted by five noand to diversity of food and of manners." The great central region of High Asis is inhabited by five no shadie races, belonging to the Mongolian division of sufficient, said observed by pyramidal heads and broad faces. These are —(1) the Ugrian, in the N. W., from whom the Magyars are believed to have descended, and of which the Finns, Laps, Ostaks of the Odi, and thise Siberian tribes, are varieties; (2) the Turkish, with their nomadic tribes, and the Ostomau branch; (3) the Mongolian, including the Calmucks; (4) the Tungmaian, in the mountainous region between Lake Bulkai and the river Okhotsk; (6) and the Bhotys race (often termed Tartars), inhabiting a great part of Thibet and the Himalayan chain. Beyond the central region occupied by the five nomadic races are various tribes of people, spread over the races are various tribes of people, spread over the lower countries of northern Asia, and over the cold plains which are traversed by the Siberian rivers and power countries of northern Asis, and over the cold plains which are travared by the Siberian rivers and border of the tey Ses. They belong to the same great division of mankind as the Tarters, whom they resemble in some of their leading characteristics, particularly in the form of the skull. He terms them lehtbyophagi or dishing tribes. To the same type of the human species as the nations of High Asis he long the Chinese, Koreuns, Japanese, the races of the Indo-Chinese peningula, and the aborigines of India, distinct from the Hindoes (who belong to the Indo-Chinese peningula, and the aborigines of India, distinct from the Hindoes (who belong to the Indo-Chinese peningula, and the shoring as afterwards occupied by the Indo-European and Syro-Arubian races there existed a more antient stock of inhabitants, also of eastern origin, but who had migrated westward at an archief date, and to whom he gives the name of Allophylians. These, when displaced by the invaders, stock reduce in the mountainous parts; and to them belong the Cancasians, the Iberians of the Tytenacu, the Berbers of the Allas chain, and the Grandles of the Cancary inlands. Of the black races of the interjor of Africs, the principal are the Sensonshire, including the Mandagean. of the sterior of Africs, the principal are the Sene-gambias, including the Mandingoes and the Foolahs. The true negro characters are most strongly marked that portion of the coast which encircles the projecting region of Western Africa to the inmost angle of the Bight of Benin, the centre of the slave trade. The Hottentots and Bushmen of South Africa in many respects recemble the nomedic Mongolians of Asia; the Hottentots and Bushmen of South Africa in many respects resemble the nomatic Mongolium of Asia; the warlike Caffres are said to combine the prominent forehead and nose of the European, the thick lips of the Kegro, and the high cheakbones of the Hottentot. Among the African races, the Abyssinian, a fine dark, but not negro race, is interesting as having preserved, "in the midst of Moslem and pagan nations, is peculiar literature and its ancient Christian church," and having remains of a wide-spread Judaism and a language approaching the Hebrew. The Oceanic races Pricing alvides into Malayo-Polynesian, Pelagian Negroes, and the Affoorians of the New Guinea group of all de (which include the Australians). The American races are distinguished from those of the old world by their anguages. The Magican tribes, which, according to having arrived on the century, found the region inhabitation, in sensions which have left the splendid ruins of Palangus as among whom were the Othomi, remarkble for their monosylatic ideas. The Equinman and Palangus as among whom were the Othomi, remarkble for their monosylatic ideas. The Equinman and Palangus as among whom were the Othomi, remarkble for their monosylatic ideas. The Equinman and Palangus as among whom were the Othomi, remarkble for their monosylatic ideas. The Equinman and Palangus as account of the continuance, extend across the accustor portion of the continuance.

Pthnology.

Payment on the Pacific event the dark Californians and the tribes of the hostic west mast, and in South America the Andrew Series, the Brazilio-Gazanai, and the meditorsument or centres groups. Dr. Leaburn adopted another chaselfornion in his "Natural History of the Variation of Mas." London, Dr. Lethum adopted another describents a his "Natural History of the Varieties of the London, 1850; but as this diffuse in some respects from that given in his article on lithuslogy in the "Racyclopedia Britannics," we shall follow the lattice, as being the more recent. He proceeds upon the decourse—[1] that, as a matter of fact, the languages of this surface are referable to a common origin, and (2) "that, as a matter of logic, this common origin for those whe speak it." He maintains that this primal facts evidence will not be overridden by the confinciant phenomena of physical and moral differences. "Bat the physical characters of our kind are permanent is argued from such a fact as the mummles of autient Egypt giving as the same cryanization that is given by the modern Copts;" and, "again, that comparatively light complexions are found in some of the hottest parts of the world, whereas dark once are found in comparatively cool ones, passes for an argument invery igus complexions are found in some of the houtest parts of the world, whereas dark once are found
in comparatively cool ones, passes for an argument
against the effects of heat on the skin." He divides
the human race into three great divisions.—(1) the
Asiatics and Northern Europeans, Polynosians, and
Americans; (2) Contral and Southers Europeans;
(3) Africans and South-western Asiatics. In the
first division are (4) those populations whose physical conformation is either typically or subtypically Mongol, having been generally recognized as
such; comprising (a) languages monosyikals, as the
Chinese, Siamese, Hurmose, (b) Turanians—languages
other than monosyllabic, groups, (1) the Mangolan, (2)
the Turk, (3) the Ugrian, (4) the Paneus, (5) the Teninsular;—(B) Iramans; groups, (1) the Mangolan, (2)
Paropamisans, (3) Armenians, (4) Roscurians (4.5; the
Caucasians of Caucasus, or Caucasians in the limited,
proper, and convenient sense of the territy;—(C) Indians;—(D) the Oceanicstock, (a) Amphinesis, (1) Protonesians, (2) Micronesians, (3) Polynesians, (4) Malagais; (b) Kelemonesians, (1) Papuans of New Guines,
(2) Tamanians, (3) Australians;—(E) Americans,
comprising, in groups yet undetermined, she Kagumaux, Algonkins, Iroquois, Sioux, Woocous, Padicus,
& the Tearst South-Americans families of weight the maux, Algonkins, Iroquois, Sioux, Woscons, Paduoss, &c.; the great South-American families, of which the ze.; the great South-American ramines, or when the limits are the most defined are, (1) the Curiciusas, (2) the Cariba, (3) the Gusrim, the Chapo, the Pampa, and the Chileno groups, being of somewhat less though still of considerable magnitude. The languages of the second division—central and southern Europeans—fall into four divisions: (1) the Basks, who inhabit the weatern Pyrenese, the north of Spain, and the south of France; (2) the Skipetar, or Albanians, who inhabit Albania, and whose language isolates them; those many hold that it can be connected with those of the fourth class; (3) the Celts (t. e. Welsh, Bretons, Gaels, and Manxmen; and (4) Sarmatians, Gormans, Latins; and Greaks, who are Indo-Karopean in the attrictest sense of the term. In the third division, the African and couthwestern Asiatic, there are: (1) the Semitic, (2) the Nilotic, (3) Kafre, (4) Negro, (5) Hottentot, Dr. S. G. Morton, whose principal works are the Grasia Americana (1839) and the Creasia Mappilicae (1844), divides man into the following groups in his catalogue of skulls, more, however, for convenience of study and examination than as an attempt at assenting classification;—(1) Caucasian group, with the Scandingvian, Finnish or Tchudic, Stavid, Anglo-Saton, Applo-American, Celtic, Sciavonic, Pelasgie, Senaitic, Berber, Nilotic, Indostenic, and Indo-Chisees races; (2) Mongolian group, with the Readmanies, (3) Malay group, with the Randings and Toltecan races; (4) American group, with the Scandings are senses; (5) Malay group, with the Malayan and Polynesia. Romanies, Romanies, Mariana, dec. Freedoms Agreest, in the Trynes of Haminot, by Magre group, with the native Africans, Hovas, and Afocras races; (6) the barbarous and Toltecan races; (5) Malay group in the Malayan and Polynesia with the strength of the trype of man, maria and the primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and distinct primordial forms of the type of man, maria and maria ann handons of the type of man, maria and maria ann handons. division—central and southern Europeans—fall into four divisions: (1) the Basks, who inhabit the western

distinct types of man. A fee gives a steels of the neutral provinces of the fannes tingdom and their relation to the different types of man. He describes them according to the following resinus: (1) Arctio, inhabited by Ryperbricais; (3) Keistis, by Mongoli; (3) European, by white men; (4) Antimosan, by American Indians; (5) African, by Rubians; by American Indians; (5) African, by Rubians; Abyestinans, Foolahs, Negroes, Hottemtots, and Boujeanen; (6) Rest-Indian or Malayan, by Papusas and Australians; and (9) Folymerican, by Papusas and Australians; and (9) Folymerican, by Papusas and Australians; and (9) Folymerican, by South-Sea Islanders, In the "Indigenous Races of the Earth" (1877), Messrs. Nott and Gliddon give suredunographic tableau, in which the races are divided zoologically, according to the injureains of Agassis; they are also grouped physiologically (after Desmoulias, Achille Compte, and O'Halley) into sixty-five famines,—even belonging to realm 1 of Agassis, twelve to realm 2, sixteen to realm 3, fourteen to realm 4, eight to realm 5, three to realm 3, two to realm 7, and tirre to realm 5. The same realms 8, two to realm 7, and three to realm 8. The same realms b, two to reamy, and three to reams. In esame reams have also their cervesponding classes, arranged linguistically, after Alfred Maury, Crawfurd, Logan, &c. A detailed account of the different Asiatic, European, and African race is given by Dr. Lathum, in his "Descriptive Fthuology," 2 vols. 1859. These remarks will show in low imperfect a state the science of other control of the control of t nology still is; and those who wish to pursue the subjest further, we would refer to the works cited. have depicted in Plates XLIX, and L., the various types of mankind. Fig. 1, which is the portrait of an Esquimant, supplies the typical signs of the Arctic race; fig. 2 is a Chinese head, as exemplying the Monyol race; fig. 3 marks the European race; fig. 4, monpor roce; ing. 3 mark the towopean race; ig. 3, the head of an American chief, typifies the American race; ig. 5 is the American race; ig. 5 is the Nepro type; fig. 6 is the Hottentot type; fig. 7 the Malay type; and fig. 8 is the Amstraisan type. The shape of the skull is shown underneuth.

ETHYN, eth'-ile (Gr. aith.r, air; ule, the material of which a thing is made), in Chem. (C. II., C. II.,), the second and most important member of the series of alcohol radicles. When a mixture of granulated zince and iodide of ethyl is heated to 300° in a tube from which the air is exhausted, a number of compounds are formed, ethyl, the radiole in question, amongst them. By breaking the tube under water, the liquid compounds are ejected in a gaseous form; and by carefully collecting the portions which come off last, the ethyl is obtained nearly in a state of purity. Ethyl is a conourless gas with slightly ethereal smell. and burns with a luminous flame. It may be liquefied at 38° Falir, by a pressure of 24 atmospheres. Frank-land estimates its boiling-point at -9°. It is the radicle of ether and alcohol, and as such deserves especial notice. It dissolves readily in alcohol, but

not in water.

ETHTLESE, OF OLEFIANT GAS, eth'-e-lene, in Chem. (C.H.), the second hydrorarbon in the olefant gas series. Those hydrogarbons are described under the head of OLEPIANT GAS

ETIOLATION, stoo-lai'-shun (Gr. aitho, I shine), in Rot., when all the green colour of a plant is absent, it is described as etiolated. This condition is produced

by the want of light.

by the want of light.

Enguyerns, et.s.ket (Fr., a ticket), denotes the forms
of manners and behaviour that prevail in polite society,
established by usage and good breeding. The names
probably derived from the custom that prevailed, on state occasious, of delivering a ticket to each person, instructing him as to the part which he was to take in the ceremony. At no time, probably, was the spirit of etiquette so predominant and so tyrannical as at the court of Louis XIV. of France. At the present day, the ctiquette of courts is becoming less and less strict; and in private society many of the old and absurd forms are given up. "Riquette," says a writer on this subject, "is the barrier which society draws around itself as a protection against offences the law cannot touch: it is a shield against the intrasion of the impertinent, the improper, and the vulgar."

Erow Cottags, «-ton, eiteated at Eton, in the county of Buckingham, was founded by Henry VI, in 1440, and was dedicated to "the Blessed Marie of Etons, beside Wyndssore." Henry had been moved to the foundation of this college by the successes of William of Wyksham's noble foundations at Winchescourt of Louis XIV. of France. At the present day, the

ber and Orford, established, about fifty years before. Bien Gellege and King's College, Cambridge, were modelled upon Wykeham's plan. The disjinal foundation seems to have provided fat treasily the establishment and twenty-five provided fat treasily the establishment of the king. In 1445 the number of alumines was reduced from twenty-five to thirfeen, that of the acholan being raised to exventy, at which it now stands. King's College, Cambridge, was also founded by Henry VI., and was designed to receive the best of the Eton foundations as accounted countried. Within the last few years this close connection, has been the last few years this close connection, but hen severed, twenty-four out of forty-eight scholarships at King's being appropriated to Eton collegers, the remainder, together with all the fellowships, being virtually thrown open. The first provest of Eton was William of Waynflate the head maker of Winchester. William of Waynfiete, the head master of Winchester, and founder of Magdalen College, Oxford, At the present day to distinct consists of a prover, rice-provest, six ich in remark assistant maters), whead master, a lower master, assists as distinct conducts (chapisius), with choosings and almostomen. The college, whick obtained several majors and advovations from its founder, received several more from Edward IV. Suce that period it has been associated and prosperous. At present there are about 200 boys, a large proportion of whom are members of the aristocracy. Those boys who do not belong to the seventy scholars on the foundation are called "oppidans," and board in the house of the assistant masters and William of Waynflete, the head master of Winchester. board in the houses of the seniciant masters and dames. The collegers wear black gowns but not college caps, as at Westminster, and their expenses are less than those of the "oppidans," who constitute the wealthy and uristocratic element of the school. In the appearance of the college itself there was nothing striking, except the size and elegant character of the houses, until the recent erection of new schools of the houses, until the recent erection of new schools and the splends restorations of the hall and the chapel, which is on the model of that of King's College, Cambridge. Among the old customs kept by at Kton College may be mentioned the "Montem," held on Whit-Tuesday every third year. The boys all appeared in fanoy costume, headed by the suptain. The last montom was held in 1944, when the contributions levied upon the spectators, or capitain's eath," as it was called, amounted to £1,338. Is 36. Many eminent and ilustrious men have been educated at Eton. These of the than, Six Educet and Horse Walpole, Lord North, and the duke of Wellington, were Etonians. Ptonians.

ETRUSCAN ARCHITECTURE, a-trus-kda.—There are but very few cristing remains of the constructive works of the ancient Etrascans from which we are enabled to judge of the professors, which this people had attained in the art of building. It is, however, certain that all works of a public nature were eminently characterized by solidity of construction, and were probably plain and devoid of elaborate sculptured decorations. The and devoid of elaborate sculptured decorations. The Tuscan order of srchitecture, the plainest and most massive in style of the five classic orders, is named after this people; and although no example remains at the present time to show that it was positively originated and adopted by them, yet we may justly believe that the Bomans derived it from a country believe that the Bomans derived it from a country which was the oradic of early Italian art, and that it forms a fair standard by which we may judge of their skill and progress in the art of building. Their temples are said by Vitravius to have been gamil, and rectangular or or cular in form. They were consenented with figures in brouze and stone, and the walls of the interior were probably panelled, and covered with paintings like those of the chambers that here been discovered in the sampleheal recorded in the sampleheal recorded in the sampleheal recorded in the sampleheal recorded. paintings like those of the chambers that have been discovered in the sepulchral mounds that are so common in Tuscany. Their private houses were low covering a large extent of ground, and surmounted with measive entablatures. Although there was but little architectural display in their buildings, the Etruscans had reached a high degree in the arts of painting and sculpture. The wase found in the Etruscans tombs are elegant in form, and the weapons and organizes are often of heautiful and elaborate construction. The principal archimetegical remains of another Etruscans that there been discovered in the same localities are often of heautiful and elaborate construction. The principal archimetegical remains of another Etruscans that the surface of the rocks at Viterbe and Rocthia; the supplicators at Entry,

### Etruscan\* Vases

also hewn out of the solid rock, and the numerous sepulchraistumuli. The roofs of many of the cham-bers found in these tunnil are smoled, and a Rome bers found in these tangul are stedled, and & Rome derived her architects and knowledge of building from Etruria, we may consider the Miruscans as the originators of the arch and vaulted roofs in Europe.—Ref. Ferguscow's Hausdood of Architecture; Dennir's Cisies and Consteries of Etruria.

ETRUSCAN VARIN.—The Etruscans asselled in the arts, and their vasas remain as models of design to this day. There is a conjecture that these beautiful vessels were not designed and manufactured by the ruling race in Effortia, but by their bondmen or seria. By whatsoever race they were made, the ware of



ETRUSCAN VASE.

which the vases were formed was both glazed and

# Eluchariat

ornamentation was a friess of small figures about an insamentation was a friess of small figures about an inch high, made from a glindrical stamp revolving in the risg. In the year 3817 same very remarkable specimens of Errmean raises were found under beds of lava near the Alban take, confishing the sales of the dead. They were indicated in larger vases with two handles, for protection. The pottery of the Errmeans competed with that of the Greeks in the Italian market. The great resemblance which exists between the Erruscan vases and those of Corinth is a proof that Erruscan vases and those of Corinth is proof that Erruscan derived from Greece her skill in modelling clay and the elegant drawing with which her vases were adorned. The manufacture was carried on between the years 600 n.c. and 395 n.c., the latter date being that of the fall of the Erruscan was a lucrative one; it is probable that Rome derived all lucrative one; it is probable that Rome derived all ber ware from this source.

ETIMOLOGY, et.c.mol'oge (Gr. etumos, true, and logos, description), is that part of grammar which treats of words by themselves, of their classification, treats of words by themselves, of their classification, their formation, and the alteration of their forms by derivation and infection. It teaches the deduction of one word from another, and the various modifications by which the sense of the same word is diversified. The recent philological researches have given to this department of grammar a much more extensive and important field of inquiry, by bringing together whole groups of languages, and showing the connection existing between them in word and form. (See Grammar, PRILOLOGY.)

EUCALYTUS, w-kd-lip'-tus (Gr. eu, well; kalupto, I cover), in Bot, a gen. of the nst. ord. Myrtuces, consisting of trees having hard wood, alternate, entire, coriaceous leaves, and yellow flowers, growing in corymbs. They are natives of Australia and Tasmania. The most important species is E. resimifers, the

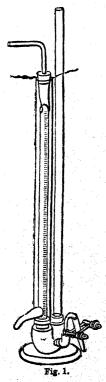
The most important species is E. resinifera, the iron-bark, which yields on incision an astringent substance called *Botany Bay kino*. This contains a peculiar substance, to which the name Encodyptis has been given. It has been employed as a remedy in diarrhos. The leaves of E. mannifera and other species spontuneously exude a saccharine substance resembling manna, and hence termed Australian manna. It is said to drop from the trees in pieces sometimes as large as an almoud. The secretions of the Eucalypti are commonly of a gummy nature, and on this account the trees are sometimes called gum-trees. The bark of some of them separates in fibrous layers; and this peculiarity has also obtained for them the name of stringy-bark trees. They frequently attain a prodigious height,—200 feet or more, the trunks being destitute of branches to a height of from 100 to 200 feet,

EUCHARIST, w. kurriet (Gr. eucharistia, the giving of thanks), is used, in a theological sense, to denote the sacrament of the Lord's Supper. The term is not found in the New Testament; but in the history not found in the new Testament; but in the autory of the institution of this ordinance, the word excharistesas occurs; and this probably led Justin Martyr and others to adopt the word, gratitude for divine mercy and grace being a chief requisite in those who would worthily partake. During the first three centuries, the Eucharist was celebrated every Sunday; but afterwards it came to be administered only three times in the year,—at Baster, Whiteantide, and Ohristmas. In early times, the Bucharist was cele-brated in the churches with closed doors, to the exclusion of all but the initiated, and it ordinarily took place at night. The use of tapers on the occasion is traced to these nocturnal celebrations. The mixing which the vases were formed was both glazed and plain. The shape of the vessel was generally an imitation of the Greek. That description of glazed vase which the Lislan antiquaries call "the national" was of pale clay, and glazed with a black colour of an ashen or leader any. The shape of the shape are call "the national" was essential to the due performance of the first saythelogy. These vases were baked at a continuous say that a block the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th bread was that in common use; but about the 7th continuous and including the continuous of the 1st was a continuous of the 1st was an antipolished expensity. The body of the vase was underly a state of the state of the 1st which was and lips were also decreased with representations of the call the same of the state of the 1st which was and lips were also decreased with representations of the animals, mostly in imitation of the metal-works of Greeces and asse. A Tayourite method of the lists which as an animals, mostly in imitation of the metal-works of Greeces and asse. A Tayourite method of the lists which was an animals, mostly in imitation of the metal-works of Greeces and asse. A Tayourite method of the lists which are the continuous to be prepared to the deep repair to the due performance of which the wine was essential to the due performance of the tries and hence the three and the internation of the same that in common use; but about the 7th and of the cross the first the performance of the call of the cross the first the common of the lists which was and large and the continuous the first three continuous the first three continuous three continuo

### Eudiometry

and divinity, is contained in either species, and in the smallest particle of each. Hence they infer, that whether the communicant receives only the bread or the wine, he enjoys the full benefit of the sacrament. In the early church, communicants appear to have received the sacrament standing.—See on this subject a learned and interesting article in Knight's English Cyclopædia, section Arts and Sciences, article "Communical".

EUDIOMETET, u-de-om-e-tre (Gr. su, well; dies, air; metron, measure), is the art of analyzing and investi-gating gaseous bodies by means of the instrument called the endiometer. It, for instance, it be desired to estimate the amount of oxygen in the air, to three measures of atmospheric sir contained in the eudio measures of sunoppures of pure hydrogen,—detonate, and upon the cooling of the vessel, observe the absorption; divide its amount by three, and the quotient will represent the amount of oxygen. This method was represent the amount of oxygen. The method was invented by Voita. The best form of eudiometer is that invented by Dr. Ure. It coneists of a siphon formed of glass, with legs of nearly equal length, open at one extremity, which is funnel-shaped, and hermetically sealed at the other, which is supplied with plantage of the property of tinum detonating wires. The siphon leg, which is scaled up, is graduated into 100 equal parts or sub-divisions of the cubic inch. In order to make use of this simple justrument, it must be filled with mercury and inverted in the pneumatic trough; a convenient supply of the gas to be measured is inserted, and having applied a finger to the orifice at the end of the open leg, the tube is removed from the trough and inverted, so as to transfer the gas to the sealed leg, where its

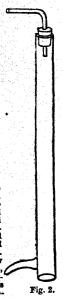


quantity can be accurately measured. A portion of mercury must then be poured from the open end of the siphon, so as to leave a space of about two inches; and, closing the aperture again, detonate by the electric spark. The included portion of air serves as a spring, and, on withdrawing the thumb, withdrawing the thumb, which closed the open aperture, and adding mercury to restore the level, the change of bulk produced in the gas by de tonation can easily be read off. Any liquid or solid that is required for the analysis of the residuary gas may then be passed up into the closed end, and different results may thus be arrived at. An improved form of endiometer has recently been invented by Mr. Josiah P. Cooke, jun., of the United States. This apparatus is easily made with a common iron casting, well known to steam-fitters as a "return bend." Any machinist will easily adupt this casting to the required use by attaching to it, as shown in fig. 1, a circular iron plate to serve as a stand, by also screwing on to one side an ordinary "elbow-joint," and at the same time by ourefully rimming out the three apertures so as to present smooth surfaces for the adhesion of the india - rubber stoppers. Into one of the openings

### Eudiometry

opening we fasten, in a similar way, an open glass tube. In the opening of the sibow-joint we secure, with a perforated india-rubber stopper as before, that convenient substitute for a stop-cock so well known to chemists as a "nipper tap." Last of all we obtain a tubulated tube, like that shown in fig. 3, of such size that it. ""Ill cores the adjustment tube and fit that tubulated tube, like that shown in lig. 2, or such size that it will cover the endiometer tube, and fit the upper end of the same india-rubber stopper by which the last is accured in its place. The upper end of this outer tube is also closed with a perforated stopper, as shown in the figure, and fine platinum wires, connecting with the wires of the endiometer, pass between

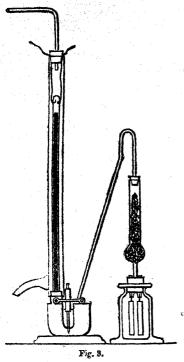
the stopper and the glass. The lower end of the outer tube should nower and of the outer tune snown not fit too tightly around the rubber stopper, so that it can easily be removed when not wanted; moreover, all the stoppers should be made of such length that while perfectly tight they can easily be removed for cleaning the tubes. It is also best to place round the upper end of the endiometer tube an india-rubber ring quite nar-row, but sufficiently thick to fill the annular space when the outer tube is in its place, and also perforated with a number of small holes, so that the steam or vapour employed in the experiments may pass freely. This ring confines the eudiometer tube, and gives greater solidity to the apparatus. greater solutive to the apparatus.
The indis-rubber joints, if well made, give great flexibility to the apparatus, and enable it to withstand quite rough usage. The eudiometer being thus mounted. mercury is first poured into the open limb, which is then closed with an india-rubber stopper, and the mercury transferred by inclining the apparatue to the closed limb, this process being repeated until the eudiometer tube is full. The excess of mercury is now drawn out of the tube by the tap, and this tube having been re-moved, the instrument is left as represented in fig. 3. The endiometer is now ready for receiving



the mixed gases which are passed up into it from a simple decomposing sell, as shown in the figure, the excess of mercury overflowing into any con-venient vessel. The open tube is now replaced and the outer tube is secured in position. It is next the outer tube is secured in position. It is next necessary to raise the temperature of the eudiometer tube to a point considerably above the boiling-point of water, and maintain it at this temperature during the reat of the experiment. This is most conveniently done by passing through the outer tube the vapour of amylic alcohol (fousel oil), which may be generated in a flask placed at one side, and connected by a glass tube with the upper end of the apparatus. The tubulature at the lower end of the tube should at the same time be dipped into the mouth of a glass bottle, into which the alcohol may flow as fast as the vapour is condensed, and, since the latent heat of this vapour is very small, this simple method of condensation will be found amply sufficient. As soon as the temperature of found amply sufficient. As soon as the temperature of the eudiometer tube is constant, which can easily be the endiometer tube is constant, which can easily be told, because the mercury column will then remain at a constant height, mercury must be poured into the open tube, or withdrawn from it by the "nipper tap," until the level is the same in both limbs of the apparatus. It remains now only to note the volume of the confined gas, and to explode it by passing an electric spark through the platinum wire already noticed; first, however, tightly closing the end of the open tube with its india-rubber stopper. When the stopper is removed, and the mercury columns again brought to the same level, it will be found that the volume of the confined gas has been reduced one-third. The resultof the "return bend," we fisten with a perforsted the same level, it will be found that the volume of the india-rubber stopper, a common straight endiameter confined gas has been reduced one-third. The result, tube, such, for example, as is ordinarily used in Bunhowers, is always a little too small, because aqueous sen's method of gas analysis; while into the second wapour, even at the boiling-point of amylic alcohol,

# Endiometry

132°, does not exactly obey Mariotte's law, and is somewhat more condensed than the mixed gases by the atmospheric pressure. It would be better to employ the vapour of a liquid having a still higher boiling-point, but the results with amylic alcohol are sufficiently accurate for a lecture experiment. This form of endiometer, although originally contrived for the lecture-table, has proved to be of still greater



value in the laboratory in all processes of gas analysis for which such an instrument is required. It is not only very cheap, simple, and easily repaired, but also equally as accurate as the most complicated apparatus. It can be used in a room of the most variable temperature, for by passing a current of water or of steam, as the case may require, through the outer tube, the temperature of the eudiometer tube may be easily temperature of the endiometer tube may be easily maintained absolutely constant. The various gases are passed in as shown at fig. 3, and through the same openings the re-agents used in the process of analysis are readily introduced. By replacing the open tube as in fig. 3, and bringing the two mercury columns to the same level, the residual volumes may always be read off under the atmospheric pressure, and at a constant temperature indicated by the thermometer placed in the annular space between the thermometer placed in the annular space between the thermometer placed in the annular space between the tubes. Or, on the other hand, by varying the height of the measury column in the outer tube, we may reduce the same volume, and measure the difference of tension according to the method of Regnault. This form of endometer is especially adapted for the admirable methods of gas analysis devised by Buassa. The absorbent balls used by him are most readily introduced when the apparatus is arranged as shown in fig. 3, and the volume of aqueous vapour, formed after combustion, may easily be measured by replacing the current of cold water through the outer tube by a current of free steam. In

#### Branch

insure that all the water is vaporised, and also in order to avoid the somewhat uncertain correction arising from the difference of temperature of the two-limbs of the apparatus. This correction, which in most cases is insignificant, becomes important when steam is used, and it is then best to measure directly the difference of level between the mercury in the open mouth of the iron cistern (fig. 3) and that in the tube. This we do by the millemeter divisions on the eudiometer tube with the sid of a very simple contrivance. A split ring of blackened sheet brass, carrying a bent steel wire, is alipped down over the outer tube until the end of the wire just touches the surface of the mercury. The vertical height of this simple measure being known, we have only to add to it the the mercury. The vertical height of this simple measure being known, we have only to add to it the measure being known, we have only to and to it the height of the mercury column above the upper edge of the ring, in order to know the exact difference of the level. Of course care must be taken when the measurement is made that the mercury column is vertical; but it is unnecessary to dwell on such obvious precautions, which are essentially the same with this apparatus as those fully detailed by Bunsen in his work on "Gasometry." The above apparatus, as represented in fig. 3. may also be used with great in his work on "Gasometry." The above apparatus, as represented in fig. 3, may also be used with great advantage in Gay-Lussac's process of determining the density of vapours. The method of using it is very simple:—After a weighed amount of the liquid under examination inclosed in a thin glass bulb has been passed up into the endiometer tube, it is readily consisted in the resulting the content of the convention of the con verted into vapour by passing steam, or the vapour of some liquid of a still higher boiling-point, through the outer tube. All the measurements required in the determination are now easily made. The temperature is measured by a thermometer, placed in the annular space between the two tubes, and the difference of level of the mercury in the two lumbs of the instrument may be most accurately determined by means of

ment may be most accurately determined by means of a cathetometer, niede by the simple contrivance just described.—Ref. Brande's Manual of Chemistry.

RUGENTA, u-je'-u--2 (in honour of Prince Eugene, of Savoy), in Bot., a gen. of the nat. ord. Myrtacex, composed of trees and shrubs with opposite entire leaves, axillary white flowers, and black or red berries. E. pimenta is the most important species. Its dried unripe fruit constitutes pimento, or Jamaica names or in most familiar heavens allarios. The popper, or, in more familiar language, allspice. The latter name is given to it because it is thought to have combined the flavours of cinnamon, clove, and nutmeg. combined the havours of combined of eve, and nutmeg. It is used as a spice, and in medicine as an aromatic stimulant. Its properties are dependent on the presence of a volatile oil. The rose-apples of the East, which are much esteemed as dessert fruits, are the product of E. malaccensis, E. aquea, E. jambos, and other species of this genus. In Brazil, the fruit of E. cratifora, the Jabuticaba, is also much esteemed. The leaves of E. Ugni are used in Chili as a substitute for Paragnay tas.

for Paragusy tea.

EULOGY, u'lloje (Gr. eu, well, and logos, a discourse), denotes, in a general sense, an encomium or panegyric pronounced on any one on account of his merits or virtue. By the early ecclesiastical writers, the term eulogy or eulogia was applied to the Eucharist; but it afterwards came to be restricted to the bread which was distributed among those who had not

communicated, or who were absent.

EULOPHIA, u-lo'-fe-d (Gr. eulophos, a handsome cret), in Bot, a gen. of Orchids. The tubercular roots of E. vera and E. cumpestris are much used in Iudia for the preparation of the nutritions substance known by the names of salep, salop, and saloop.

EUNUCH, w'-nuk (Gr. euns, a bed, and echein, to

EUNUCH, w'-nuk (Gr. euns, a bed, and echein, to have the care of), is literally, one who has the cure of a bed, a name given to this class of persons in the East, from their being intrusted with the care of the women's apartments, or harems. The practice is of great satiquity, and even in the time of Herodotus it was carried on to a great extent among the Persians, who not merely intrusted the care of their wives and daughter to expruse but considered them as more are most readily introduced when the apparatus is daughters to canuchs, but considered them as more arranged as shown in fig. 3, and the volume of trustworthy than other men. The practice of making aqueous vapour, formed after combustion, may easily be measured by replacing the current of cold water through the outer tube by a current of free steam. In this case it will be best to measure the gas under as court. Zeal for religion, as in he case of Origen, has

#### Engnymus

caused many persons thus to mutilate themselves; and in the 3rd century there arose a sect of heretics, who not only treated thus those of their own persuasion, but all others on whom they could lay hands. Several of the Christian emperors of Rome forbade the prac-tice of making eunuchs; and Justinian imposed a law tice of making ennuchs; and Justinian imposed a law of retaliation on such as were guilty of such inhumanity. The council of Nice, at a later period, excluded from the pale of the Church all who, from whatever cause, made ennuchs of themselves. The practice is said to have prevailed in Italy, with the view of preserving the voice of singers for the operas of Europe; and in the Rast, in the present day, the seraginos are chiefly guarded by eunchs.

BUONYMUS, 4-on-4-smus (Gr. eu, well; onoma, a name), in Bot., a gen. of the nat. ord. Celustracea. The species E. europæus is the common spindle-tree of our hedges. In France, charcoal prepared from the wood is largely used in the manufacture of gunpowder; while the young shoots, in a charred condition, are

while the young shoots, in a charred condition, are employed as rough crayons for sketching. The seeds are stated to be purgative and emetic, and also to be poisonous to sheep. The bark of *E. tingens* can be used as a yellow dye-stuff.

used as a yellow dye-stuff.

EUPATORIUM, w-pà-to'-re-um (derived by Linneus from Mithridates Eupator, who first used it as a counter-poison), in Bot., a gen. of the nat. ord. Composite, sub-ord. Tubiliflore. The leaves of E. quiti-nosum constitute a sort of matico, which is employed as a styptic. The matico used in this country is, however, derived from Artanthe elungata. E. ayapana and perfoliatum are employed as antidotes to the bites of venomous reputiles. of venomous reptiles.

ETHEMISM, u'.'fe.mism (Gr. eu, well, and phemi, I speak), is a figure in Rhet., by which one expression is substituted for another, so as to convey the meaning in less offensive or milder terms; as when we use the word departed for dead. Euphemisms were

word acparted for dead. Eupnemisms were much employed by the ancients to avoid the use of words or phrases which were regarded as ominous.

EUPNONE, "fo-ne (Gr. eu, well, and phone, sound), denotes an agreeable sound, or combination of sounds,—that pleasing quality in language which results from the happy combination of the enunciative elements.

EUPHORBIA, a-for-be-t (named after Euphorbus, physician to Juba, king of Mauritania), in Bot., the typical gen. of the nat. ord. Euphorbiacea, consisting of about 300 epecies, many of which have valuable properties. The acrid resin commonly known as gum Euphorbium is the produce of certain undetermined epecies, the principal of which are probably E. anti-quorum, cunariensis, and officinarum. It is a dangerous emetic, cathartic, and rubefacient, and produces severe inflammation of the nostrils if those who powder it do from the wounded stems, and collected in leather begs. In India it is said to be mixed with the oil expressed from the seeds of Sessamum orientale, and employed externally in rheumatic affections, and internally in cases of obstinate constipution. The Arabs are stated to make up violent diuretic pills by rubbing over the juice of the species E. antiquorum with flour : their camels, however, are said to est the branches of the plant when cooked. The juice of the species E. cerei formic, heptagona, and virosa, African plants, turnish the Ethiopians with a mortal poison for their arrows, whilst that of E. cotinifolia serves a like purpose for the Brazilian Indians. The species E. hibernica is exthe Brazilian Indians. The species E. kibernica is extensively used by the peasantry of Kerry for the purpose of stupefying fish; and so powerful are its properties said to be, that a small kreel or basket filled with the bruised herb suffices to stupefy the fish for several miles down a river. E. hypercifolia, a plant of tropical America, is astringent and somewhat narcotic, and is employed in the diarrhos of children and as a vermifuge; and E. thymifolia is employed for a like purpose in India. The root of E. Ipecacuanha is and to be equal to the true ipecacuanha, and is com-monly used in the states of North America. Another member species, E. corolata, the milk-weed, is also used as an emetic in the States. The fruits of E. lathyris, or experience, are sometimes pickled and eaten, instead of ordinary capers; but although the process of pickling appears to destroy in a great measure the acrid purgative properties which the fruits possess in a fresh

# Eutychians

state, their use is by no means free from danger. A very active cathactic oil may be expressed from the seeds of the caper-spurge. The leaves of E. sergible are prescribed by the native practitioners of India-bath internally as a purge, and externally, mixed with Margosa oil, in certain cases of contracted limb. The roots of E. palustris and pilosa are used as purgatives, and are said to have proved useful in hydrophobia. Many other species are purgative. E. Tirucalli, a native of India, is common in the Madras presidency, and makes an excellent hedge, as no cattle will touch its leaves. The sap of E. phosphorea is said to aline with a phosphorescent light in the forests of Brazil on warm nights.

nights.

EUPHORBIACE, u-for-be-ai'-se-e, in Bot., the Spurgewort fam., a nat. ord. of Dicotyledones, in the sub-class Monochamydes, consisting of trees, shrubs, and herbaceous plants, generally with an aerid milky juice. The flowers are uniexual, monocious or diceious, terminal sematimes inclosed in a calyx-like axillary or terminal, sometimes inclosed in a calyx-like involucre; achlamydeous, or with a lobed inferior calyx, having on its inside glandular or scaly appendages, or even evident petals, which are either distinct or united. The anthers are two-celled. The female flowers have a superior ovary, which is either elevated upon a stalk or sessile upon the thalamus, one-, two-, three-, or many-celled. The styles are either absent, or corresponding in number to the cells of the overy, entire or divided. The stigmas are equal in number to the cells of the overy, or, when the styles are divided, corresponding in number to their divisions; the ovules, one or two in each cell, suspended from the inner angles of the cell. The fruit is either dry, when its parts separate from each other and from the axis, its parts separate from each other and from the axis, usually opening with elasticity, or succulent and inchiscent. Seeds one or two in each cell, suspended, often with an aril or carunculate. Embryo inclosed in fleshy albumen, cotyledons flat, radicle superior. The plants of the order are more or less distributed over the globe, but are especially abundant in warm regions, particularly in equinoctial America. Many are extremely poisonous, the poisonous principle being contained in the milky juice, and pervading all parts of the plant, more or less. Many have been employed medicinally, as rubefacients, suppurants, emetics, and cathartics. Some, as cascarilla, are toffic, aromatic, and stimulant, and are perfectly devoid of any aerid or poisonous principle. Others, as manihot, yield starch, which is largely employed for food. Cacutchous and resin are obtained from the milky juice of others. The seeds of many yield oils, milky juice of others. The seeds of many yield oils, either of a bland or of an irritating nature. A few of the fruits, and some of the roots, are said to be eatable. Timber is yielded by some, as the box; and dye-stuffs by others. The hairs of some are stinging.

RUPHUISM, ul-fu-izm (Gr. suphues, eloquent, of vigorous growth), a word employed in English literature to designate a bombastic inflated mode of expression. This style of language enjoyed a short-lived popularity during the reign of Elizabeth. The term originated from the title of a book by John Lyly, "Kuphues," whose affected language formed the model of the

style.

EUTION, w'-pe-on (Gr., very fat).—A very limpid fluid, first discovered by Reichenbach in wood tar. It is found in the tar produced by the destructive dis-tillation of several vegetable and snimal substances, its properties being found to agree with those hydrone properties being found to agree with those hydro-carbons found in Boghead mineral. It evaporates at 340°; its specific gravity is 0.74. It is soluble in alcohol and ether, but does not dissolve in water. It has no smell, is tasteless, and is highly inflammable. It is the opinion of Mr. C. Greville Williams that this and other hydrogenican will acceptable by a format and other hydrocarbons will eventually be of great value in the arts.

value in the arts.

EUSTACHIAN TUBE, in Anat. (See EAR.)

EUSTACHIAN VALVE, u-stat'-ke-da (after Eustachius, the celebrated anatomist), in Anat., is a membranous semiliner valve separating the right auricle of the heart from the inferior veus cava.

EUTERPE, u-ter-pe, in Rot., a gen. of palms. The species E. montana is one of the cabbage-palms, so called because the joung leaf-buds are boiled and eaten like cabbage. eaten like cabbage.

EUTECHIANS, u-tik'-e-dus, in Recl. Hist., were a re-

### Evangelical

bigious sect which arose about the middle of the 5th century, and were named after their founder, Buty-ches, abbot of a monastery in Constantinople. In opence, apper or a monastery in constanting. It op-posing the doctrines of Nestoring who had been charged with dividing the nature of Christ into two distinct per-sens, they fell into the opposite extreme, and held that the human nature of Christ was absorbed in the divine, and that his body had no real existence. Their views were condemned in a synod held at Constantinople in 460, by Flavian, patriarch of that city, and Entyches himself deposed; but the following year this judgment was reversed by a general council held at Ephesus, and the doctrine of Eutyches declared to be orthodox. Butychianism, however, was finally condemned in 451, at the general council of Chalcedon, which de-clared "that in Christ two distinct natures were united in one person, and that without any change, mixture, or confusion." The heresy, however, spread very extensively through the East, and the monophysite doctrine continues to exist in the Armenian and Coptic churches to the present day.

Brangenical, e-van-jel-e-kal (from Gr. enaggelion, good news), denotes, in general, agreeable to, or in conformity with, the doctrines of the Gospel. It is frequently applied to those who make the actonement of Christ alone, and not the performance of moral duties, the ground of salvation; and hence it is frequently used as synonymous with orthodox. A body in the Anglican church assume to themselves the name of Evangelical, their views coinciding very much with those of dissenters. In Prusia the term is employed to designate the national Protestant church, which is formed by a union of both Calvinists and Lutherans.

being an attempt to unite the two parties.

EVANGELICAL ALLIANCE is an association of Christians of various denominations, formally organized in London in 1846. Its object is to promote unity and co-operation among the different sects of Protestants, and to unite their efforts against the advances of Ro-manism and infidelity. Their object is also to encou-rage and strengthen labourers in the cause of Christisuity in all parts of the world, particularly such as are struggling with difficulties and hardships. They also exert themselves in behalf of religious toleration in all parts of the world. They have numerous branches, not only in the United Kingdom, but France, Germany, Sweden, and other parts of the contineut; America, Australia, East and West Indies, Africa, &c. The members of the alliance are such as hold evan-The members of the alliance are such as hold evan-gelical views on the following points:—the divine in-spiration of the Holy Scriptures, and the right of private judgment; the Trinity; depravity of human nature; the incarnation; justification by faith alone; the work of the Holy Spirit in conversion; the immor-tality of the soul; resurrection and judgment; the divine institution of the Christian ministry; and the obligation of the ordinauces of baptism and the Lord's sunner. They hold conferences for devotion and supper. They hold conferences for devotion and mutual consultation in London, Paris, Berlin, and other cities; the last being held at Geneva, in 1861.

EVANGELICAL ASSOCIATION, a religious body which took its rise in the state of Pennsylvania in 1800, and has since spread over most of the free states and a great part of Canada. Its founder was Jacob Albrecht. a German Lutheran, who, impressed with the want of religious life and the corruptions that prevailed among the German churches, commenced a course of ikinerant preaching, and made many followers. In 1859 they had over 300 itinerant, and a still greater number of local preachers, while their adult members were nearly 40,000. They devote themselves much to missionary labour, especially among the German pulation. In theology, they are Arminian; but on her points they agree in the essentials of Christianity population. with the various evangelical churches, with whom they

seek to cultivate friendly feelings.

Evangelical Union, the name assumed by a re-ligious body which was formed in Scotland in 1843. ligious body which was formed in Scotland in 1845, but which are better known under the name of Morrisonians. Their founder, the Rev. James Morrison, of Kilmarnock, was ejected from the United Secession Church for holding views contrary to the standards of that body. He held that the death of Christ bore no special relation to the elect, but was for the sine of the whole world; that all men were able of themselves to

#### Eviction

believe the Gospel; that original ain cannot render believe the Gospel; that original sin cannot render men liable to condemnation; that no person ought to be directed to pray for grace to help him to believe. EVARGELIET, e-cin'-je-list (Gr. es., well, and aggello, I announce), is properly one who brings good tidings. Hence the writers of the four gospels are called evan-gelists, because they proclaim the glad tidings of salvation through Christ. Evangelist was also the name given to a particular class of Christian teachers chosen by the spostles to preach the Gospel, and asking effect the anostles and prophets but hefore chosen by the apostles to preach the Gospel, and ranking after the apostles and prophets, but before the pastors and teachers. They had no particular flocks assigned to them, but travelled from place to place under the direction of the apostles. This order is supposed to have been merely temporary, like that of apostles and prophets; and the term is now only applied to those writers in the New Testament who

have given us the history of our Lord.

EVAPORATION, e-vap-o-vai'-shun (Lat. evaporatio, an evaporation), the conversion of liquid or solid bodies into elastic vapours or gases by means of heat. Evaproration goes on allowly or rapidly according to cir-cumatances. Water evaporates gradually at ordinary temperatures all over the surface of the globe. It rises in the air as vapour, and when condensed by change of temperature, forms rain or dew, and de-scends again to the earth. When, however, evapo-ration takes place rapidly, as in the case of ebullition, it is generally called vaporization. The quantity of vapour which rises from the surface of a liquid in the open air not only depends upon the quantity of surface exposed, but also on the state of the atmosphere lace exposed, but also on the state of the atmosphere at the time. In warm and dry weather, both in winter and summer, evaporation is greatest. It was found by Dr. Dalton that water raised to 212° evaporated at the rate of 4248 grains per minute. Mercury does not evaporate till it is raised to 60° or 80°. Below that temperature the gravity of the constituent atoms is greater than their clastic force. In all liquids whose boiling-points are high, the clastic force of the vapour is very small. The clastic forces of the vapours of most solid bodies are so low that they cannot be evaporated by the highest natural temperatures. evaporated by the highest natural temperatures. The evaporation of a liquid is a gooling process to the liquid itself. This fact is made useful in India in order to produce ice. Water is exposed in shallow, unglazed, earthen vessels, resting upon imperfectly conducting substances, such as sugarcanes, &c. During the dry clear nights evaporation goes on, and a thin film of ice is formed. The cold produced by the formation of vapour may easily be observed by placing a cloth dipped in ether or alcohol on the bulb of a thermometer. The mercury will continue to deseen as long as the evaporation lasts. If mercury is placed in the receiver of an air-pump, together with placed in the receiver of an air-pump, together with sulphuret of carbon, when the air is withdrawn, the cold produced by the cyaporation of the sulphuret of carbon is sufficient to freeze the mercury. (See METEOROLOGY, HYGROMETER, RAIN.)

Eve, ew (Aug. Sax.), is a term frequently applied to the night before certain holidays or festivals; as Christmas eve, the evening before Christmas day. In the primitive church, it was customary for Christians to pass a great portion of the night which preceded a holiday in religious exercises; and these, from their being performed in the night-time, were called vigils

or watchings. These night meetings came to be so much abused that they were at length abolished. Evening Schools. (See Schools.) Evening Schools. (See Schools) even restricted of a hip on the water; thus, a ship is said to swim upon an even-keel when she draws the same draught of

water forward as abaft.

EVICTION, e-vik'-shun (from Lat. evince, I over-come), signifies a recovery of lands by means of a form of law. It is, however, one of the most severe processes, and it is only resorted to in extreme cases. To render an illustration, it may be stated that it has been, at various times, called into action in Ireland, peen, as various times, called into action in Ireland, where tenants were evicted, i.e. driven off the lands they rented, in consequence either of inability or unwillingness to pay their rent, or, as in late instances, on account of the prevalence of Bibboursm or landlord murder. With regard to its legal properties, it is recorded, that if land is evicted before the time of

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#### Evidence

payment, the said land being on lease, no rent is incurred or is liable by the lease. Where lands are taken "on extent," and are evicted or recovered by better title, the plaintiff shall have a new exceution If a widow is evicted of her dower or thirds, she shall be endowed with the other lands of the heir. Lastly, if in exchange of lands, either party is evicted of the lands given in exchange, he may enter again into possession of his own lands which he thus exchanged. (Not further information, see Law Reports.)

(For further information, see Law Reports.)

EVIDENCE, eve-e-dens (Ang.-Nor., from Lat. evidentia), in Law, denotes, in its widest sense, whatever, exclusive of mere argument, legally tends to prove or disprove any matter of fact, the truth of which is sub-mitted to judicial investigation. It is so called because mitted to junious invessigation.

It makes evident or clear, or saccrtains the truth of the fact or point at issue, either on the one side or on the other. When such evidence is sufficient to produce a continuous control of the con conviction of the truth of the fact to be established, it amounts to proof. By competent evidence is meant that which the law requires as the fit and appropriate of a writing where its contents are the subject of inquiry. By satisfactory evidence, or, as it is sometimes called, sufficient evidence, is denoted that amount of proof which ordinarily satisfies an unprejudiced mind beyond reasonable doubt. Circumstantial ovidence is denoted that amount of proof which ordinarily satisfies an unprejudiced mind beyond reasonable doubt. Circumstantial ovidence is denoted that amount of the content of the dence is distinguished from positive proof, and is founded on the doctrine of presumptions; for when the fact itself cannot he demonstratively evinced, that which comes nearest to the proof of the fact is the proof of such circumstances as necessarily or usually proof of such circumstances as necessarily or usually attend such facts. Very strong presumption is, in many cases, equal to full proof. As a general rule, the best evidence of a fact must be given that its nature admits of. This rule does not demand the greatest amount of evidence which can possibly be given of any fact, but is to prevent fraud; the presumption being, when the best evidence is withheld, that the party has some sinister motive for not producing it. Primary evidence is that kind of proof which in the eye of the law affords the createst certainty of the the eye of the law affords the greatest certainty of the fact in question. All evidence falling short of this in its degree is termed secondary. This distinction in its degree is termed secondary. This distinction refers only to the quality, not to the strength of the proof; for evidence which carries on its face an indication that better remains behind, is not primary but se-condary. As a rule, secondary evidence is inadmissible until it be shown that the production of primary evidence is out of the parfy spower; as where an instrument is destroyed or lost, its contents may be proved by secondary evidence. The first degree of evidence, and, though liable to error and misconception, the most satisfactory to the mind, is that afforded by the senses; as where a judge or jury can have the matter in dispute brought before their eyes, so that they may judge for themselves. This mode of evidence, however, is seldom attainable in judicial trials, and the law is satisfied with requiring the next bestevidence,—namely, the testimony of those who can speak from their own personal knowledge, which is termed heavay evidence. But it is requisite that, whatever facts the witness may speak to, he should be confined to those lying within his own knowledge, whether they be things said or until it be shown that the production of primary evihis own knowledge, whether they be things said or done, and should not testify from information given by others, however worthy of credit they may be. The dying declaration of a person who expects to die, respecting the circumstances under which he received a mortal injury, is admitted as evidence in criminal prosecutions in regard to the death, though the accused secutions in regard to the death, though the accused; was not present when they were made, and had no opportunity for cross-examination; it being considered that a person in constant expectation of immediate it to the temporal from all temptation to falsehoods; but it is necessary to show that he was aware of his condition at the time of making his declaration. A person is said to be admitted as queen's evidence when, being one of the accused, he confesses his crime, and is admitted as evidence against his accomplies. It is

Examination

antithesis or negation of good. "In the abstract, evil is want of conformity to the standard of good, whatever that may be; in the concrete, evil is snything that comes short of what is perfectly good." A very superficial view of things as they exist in this world is suffiiciat view of taings as they exist in this word is sumi-cient to convince one of the existence of evil; i. e. that all things come short of our ideal of goodness and per-fection. Evil is usually divided into physical and moral, —the former including whatever is opposed to good in the sense of happiness; the latter, whatever is opposed to good in the sense of virtue. The question concerning the origin of evil has exercised the ingenuity of speculative men from the earliest times, and various speculative men from the earliest times, and various theories have been proposed. The oldest and most widely spread of these is the *dualistic*, which supposes two opposite agencies or co-eternal and independent principles, the one the author of all the good, the other of all the evil in the universe. This doctrine prevails in the heathen systems of the East, and was also held by the Manichmans and others. A favourite hypothesis among the ancient philosophers was that of pre-existence; according to which, the evils which we suffer at present are punishments and expiations of moral delinquencies committed in a former stage of moral delinquencies committed in a former stage of our being. The doctrine of optimism supposes that all events are ordered for the best, and that the evils which we suffer are parts of a great system conducted by almighty power under the direction of infinite wisdom and goodness. This comprises two very dif-ferent classes of philosophers,—those who admit and those who deny the freedom of human actions and the accountableness of man as a moral agent. None of these modes of solving the difficulty appears satisfac-tory, and the Bible throws little light upon the subject. "The Bible, however, fully authorizes the only con-clusions to which reason can safely come on this dark clusions to which reason can safely come on this dark subject; viz.—1. That God is not the author of evil in any sense; 2. that, though able to prevent it, he has permitted it to exist; 3. that the evil permitted in the universe is not only less than the good directly willed by God, but is characterized as something intrusive and transitory, while the good is fundamental and permanent; 4. that God, in permitting evil, has not left it uncontrolled, but even holds it in his power and makes it subservient to his purposes; 5. that he will pltimately overrule the evil which he has permitted, so as to evolve a larger amount of good for his universe than if evil had not been permitted; and, in fine, that all that is perplexing to us in the existence of evil arises out of the limitation of our understanding;" that "the phenomenon of evil, which to us is so full of difficulty, may by higher intelligences—must by the highest—be may by higher intelligences—must by the highest—be seen to be in perfect accordance with the noblest order and the purest rectitude."—(Alexander.)—Ref. Ency-clopadia Britannica, art. "Evil." by Dr. W. L. Alex-ander; Stewart's Philosophy of the Active and Morad Powers; King, On the Origin of Evil; Müller, On the

Christian Doctrine of Sin.

Evil Eve, a malignant influence superstitionsly secribed to certain persons, in virtue of which they are supposed to injure those on whom they cast an envious

or hostile look.

EVIL, KING's, a name formerly applied in England to scrofula, from the belief that it was curable by the touch of the king. This belief was long and very generally held, and we are told that Dr. Johnson was touched

for this disease.

EWR, the female of the sheep. (See SEREP.)

EXAMINATION, egs-am-in-ai-shun (Lat. examinatio), is the usual mode of ascertaining the nature and extent of one's attainments. Examinations are of three kinds, advantional competitive, testing. The first of these -educational, competitive, testing. The first of these is employed in teaching, the second is resorted to for is employed in teaching, the second is resorted to for ascertaining the relative merits of several individuals, and the last determines who ome up to a fixed standard. In teaching, standard means of training the faculties of the scholar; tending mot only to fix his knowledge of the scholar; tending mot only to fix his knowledge in his mind, but to give him a proper command of it, and a facility in using it, that he would not otherwise statim. It is necessary that these objects be kept distinctly in view by the teacher, otherwise he may be the means of unsenting rather than establishing the is admitted as evidence against his accomplices. It is, in his mind, but to give him a proper command of it, at the discretion of the court whether they admit one and a facility in using it, that he would not otherwise as queen's evidence; but if he is admitted, and his attain. It is necessary that these objects be kept dispartners are convicted, he is entitled to his pardon.—

\*\*Edge Taylor's Treatise on the Law of Evidence; the means of masseting rather than establishing the scholar's knowledge, and may give confusion rather Evil., e'-vi (Sax. efel, yiel), may be said to be the than clearness to his ideas. Competitive examinations

are such as are made of a number of individuals for the purpose of determining their relative attainments, and are more especially with the view of bestowing prises. Competitive examinations are very liable to abuse, and ought to be used with caution, as their tea-deucy is to stimulate emulation, rather than foster a love of learning for its own sake; to exercise the memory, rather than to train the other faculties; and memory, rather than to train the other faculties; and to make all the reading and thought of the caudidates turn upon the examinations. It also gives rise to a system of "cramming," by which many things are committed to the memory that should never have been thrust upon it, and which are not intended to be retained. All this is very injurious to the natural powers of the mind. In test or pass examinations, the object is not to assertain the relative qualifications of a number of candidates, or their highest attainments, but who of them come up to a certain standard. They are used to determine the shilty of a candidates. They are used to determine the ability of a candidate to enter a university or to join a particular class, to be admitted to practise a certain profession, or to fill a particular folice. Test examinations, if properly conducted, if the subjects of examination are judiciously selected, and if the standard is properly adjusted, are of great value and importance. Examinations may be conducted either orally or by writing, and each has its particular advantages; so that the best is a judicious combination of the two. In an oral examination, the examiner can most easily and clearly discover the depth of the scholar's attainments, and ascertain his readiness, and the command that he has over what he Too much stress, however, ought not to be laid upon this kind of examination; for there are some persons whom it renders nervous and incapacitates from sous whom it removes nervous and incapacitates from using their knowledge. There is also a class of persons known as the "slow but sure," who are not calculated to shine in this way. By written examination, the defects of the oral may be compensated. Subjects that require deliberation, and which are intended to test the reaching normal and individual to the contract of the compensation of the compensati soning powers and judgment, are best treated in this way. The subject of examinations has recently come way. The subject of examinations has recently come to acquire greater importance, from their being now used in determining the qualifications of candidates for the civil service (which see). Much has been said both for and against this measure; and there can be no doubt it has its good and its bad features. It is however, a decided improvement upon the previous extension and many of its objectionable features are system; and many of its objectionable features are such as will necessarily disappear in time, and as the subject comes to be better understood. One danger is the laying too much stress upon the examinations; for, however useful they may be in ascertaining special acquirements, they, in general, afford little means of judging of the more important qualities of industry, punctuality, steadiness, attention. Every-day experience shows that men have risen to the highest rank in their several walks of life who were never remarkable for their acquirements at school. In general, the standard of examination is placed too high, and embraces too great a variety of subjects,—subjects, too, which have little or no bearing upon the office which the cand date is intended to fill. Government, in this respect, might well look to the proceedings of private individuals. A merchant scarcely requires of his clerk to be well read in the ancient classics, or "up" in the be be well read in the ament classics, or "up" in the higher mathematics; or of his messenger to be well versed in history and geography. The present system, however, is immeasurably in advance of the old; and we may reasonably hope that many of its present defects will be remedied in the course of time.

defects will be remedied in the course of time.

EXCELLENCY, ek'-sel-len-se (Lat. excellentia, excellence), a title first borne by the Lombard kings, and afterwards assumed by several emperors of the West.

It was afterwards transferred to the inferior princes, especially in Italy, until they also gave it up, after Pope Urban VIII., in 1630, had bestowed the title of "eminence" on the cardinals. Since that period the title of excellency has become a title of office or service, neither hereditary nor transferable from one member of a family to another. but always belonging service, neither hereditary nor transtration from one member of a family to suother, but always belonging to the office. In Europe it is only borne by ministers in actual service, by the highest court and military digutices and, by ambassadors and openipotentiaries, Governors of English colonies also receive the title

of excellency.

EXCHANGE, eks'-tshainj (Fr. échange), is, properly, the giving of one thing or commodity for another, and in commercial language is employed to denote the means by which the debts of persons residing at a means by which the debts of persons residing at a distance from their creditors are discharged without the transmission of money or goods. This is effected by means of what are known as bills of exchange. A bill of exchange is simply an order addressed to some person at a distance, directing him to pay a certain specified sum to the person in whose favour the bill is drawn, or his order. A merchant in London, who may have the content of he due a sum of money for goods to a merchant in be due a sum of money for goods to a inerchaft in Hamburg (instead of remitting money or goods to the amount of the debt), goes into the market and buys from another merchant who has a debtur in Hamburg a bill of exchange for the amount, which he transmits to his creditor in Hamburg, who in this way gets pay-ment of his debt from a person in his own town, the debtur of the second merchant. In this way, the debtor in the one place is substituted for the debtor in the other, to the great convenience of all parties. Bills of in the one piace is substituted for the debtor in the other, to the great convenience of all parties. Bills of exchange are of two kinds,—inland and foreign; inland, when both parties are in England; and foreign, when one of them is abroad, or in Scotland or Ireland. (See BILL OF EXCHANGE.) Exchanges between different parts of the United Kingdom are now almost entirely in the hands of handers. In often or sounding hands of the control of in the bands of bankers. In cities or countries having a considerable amount of intercourse together, the debts mutually due by the one to the other approach for the most part near to an equality. Between countries making use of different currencies there is what is known as a par of exchange, which is the equivalency of a certain amount of the currency of one country in the currency of the other, the currencies of both being supposed to be of the precise weight and purity fixed by their respective mints. Among the causes that affect the par of exchange, in addition to a rise or fail in the price of the precious metals, are, (1) changes made by authority in the quantity of pure metal con-tained in the coin by way of increase or diminution; tained in the coin by way of increase or diminution; (2) depreciation from the use of paper-money; (3) dipping; (4) tear and wear. When two countries trade together, and each boys of the other exactly to the amount that it sells, their claims will balance each other, and the exchange will be at par. This, however, is rarely the case; for there is almost always a balance owing on the one side or the other, and this balance affects the rate of exchange. Thus, if London sends more goods to Hautburg than she receives from it, there will be a greater demand for bills upon London in Hamburg than of bills upon Hamburg in London, and their value will proportionally advance above par, while in London, in like manner, they will fall below it. It is evident, however, that these fluctuations in the real exchange are subject to certain limits, beyond real exchange are subject to certain limits, beyond which they cannot advance. Thus the price of bills of exchange on any place can never exceed the expense of sending bullion to that place, otherwise the merchant will find it to his advantage to transmit bullion in place of bills. The tendency of any advance in the rate of exchange is to stimulate exportation and to put a check upon importation.—Ref. Encyclopadia Britannica, art. "Exchange." by J. R. McCulloch; McCulloch's Com-

mercial Dictionary.

Excheques, eks-tshek-ker (Ir. échiquier, Lat. scaccarium), is the name of an ancient court of record, wherein all causes touching the revenue and rights of the crown are heard and determined, and where the revenues of the crown are received. According to Camden, the court took its name from the chequed count, resembling a chess-board, which covered the table there, and on which, when certain of the king's accounts were made up, the sums were marked and scored with counters. This court was established by William the Conqueror as part of the Aula Regis, and reduced to its present order by Edward I. It was principally intended at first to order the revenues of the crown and to recover the king's debts and duties; but it subsequently acquired the additional character of an ordinary court of justice between subject and subject. It consists of two divisions,—the receipt of the exchequer, which manages the royal revenue, and the court, or judicial part of it. (See Court or Ex-CHEQUER.) As a court of revenue it ascertains and enforces, by proceedings appropriate to the case, the

preprietary rights of the crown against the subjects of the realm. To proceed against a person in this depart-ment of the court is called to suckequer him. The practice and procedure on this side of the court was amended by 22 & 23 Vict. c. 21. The judges of the court of Exchequer are the chancellor of the exchequer and one chief and four other barons. The first of these, however, now exercises no judicial functions, and only takes his seat formally on certain occasions. The duties of the chancellor of the exchequer are confined to matters relating to the finance of the country and the receipt and payment of revenue. He is, in fact, the principal finance minister of the crown, and exercises the chief and most responsible control over the expenditure of the different branches of the public service, the details of which are annually submitted for his rethe details of which are annually submitted for his re-vision. He prepares the annual statement of the esti-mated expenses of the country, and the ways and means by which they are to be defrayed, including the im-position or remission of taxes. (See Burger.) This office has sometime: been held conjointly with that of

office has sometimer been held conjointly with that of tirst lord of the Treasury.

Exchequer Bills are bills of credit issued under authority of parliament, and forming the principal part of the unfunded debt of this country. They are for sums varying from £100 to £1,000, and bear interest generally from ½d. to ½d. per day per cent., according to the usual rate of interest at the time. They were first issued in the reign of William III., 1696, and have been continued annually ever since. The amount of exchequer bills outstanding and unprovided for in 1861 was £20,435,107. The bills pass from hand to hand as money without any formal transfer, and the option is given periodically to holders of being paid their amount at par. Act 24 Vict. c. 5 (1861), declares that fourteen days prior to the expiry of each twelve months from the date of issue, and during their legal currency, notice is to be given in the London Gazette, that payment will be made, and if not then claimed, such bills are to have legal currency for another twelve months, and go on from year to year; but the holder cannot claim payment at any interval between the times fixed by such yearly notices; ex-cept that such bills during any part of the last six mouths of each year may be used in payment of any duties or taxes due to the crown. It is enacted that the bills are to be prepared in a form fixed by the Treasury, and to be signed by the comptroller general or assistant comptroller, the rate of interest being fixed by the commissioners of the Treasury, and to be payable half-yearly by the Bank of England, but not to exceed £5. 10s, per cent, per annum. The Treasury are empowered to issue new bills to replace old ones to any amount not exceeding £13,230,000.

EXCHEQUER, COURT OF. (See COURT OF EX-

CHEQUEE.)

EXCISE, eks-size' (Du. accys, Ger. accise), is derived from the Latin excisa (see. pars), and properly signifies that part of the profits of the manufacturer or producer which is out off for the support of the government, before the commodity is sold. It is generally applied to those taxes or duties which are levied upon certain articles produced and consumed at home,—excissable articles when exported to other countries being usually entitled to a certain drawback. There are, however, certain duties included in the excise branch of the revenue to which the above defiexcess oranne of the revenue to which the above demision does not strictly apply; as licenses for carrying or certain trades. This mode of taxation had been established in Holland at an early period, but was first introduced into this country by the Parliament in 1643, in order to carry on the war against the Crown. The royalists soon after also had recourse to this mode of revaluts soon after also had recourse to this mode of raising money, both sides declaving that the excise should be continued no longer than to the end of the war. It was first imposed upon the makers and vendors of beer, ale, cider, and perry; but the Parliament soon after laid it on flesh, wine, tobacco, sugar, and a number of other commodities, in pursuance of a plan

been accustomed to it for some years, the Parliament openly declared, in 1649, that "the impost of excise was the most easy and indifferent levy that could be laid upon the people;" and, accordingly, it was con-tinued during the Commonwealth. Upon the Restora-tion, the excise duties were by 12 Car. II. c. 24, granted as part of the revenues of the crown, in lieu of the military tenures and the right of pre-emption of the inhitary tenures and the right of pre-emption and purveyance. By 30 Geo. II. c. 19, this branch of the royal revenue was taken from the crown and an annual sum of upwards of \$27,000 granted in its stead. During the reigns of William III. and succeeding monarchs, excise duties were laid upon a number of commodities in order to meet the enormous expenditure. commodities in order to meet the enormous expenditure occasioned by our wars on the continent. "Thus," says Blackstone in 1765, "brandles and other spirits are now excised at the distillery; printed silks and linens at the printer's; starch and listing powders at the maker's; gold and silver wire at the wire-drawer's; plate in the hands of the vendor, who pays yearly for a license to sell it; lands and goods sold by anction, for which a pound-rate is payable by the auctioneer, who also is charged with an annual duty for his license; and coaches and other wheel-carriages, for which the occupier is excised, though not with the same circumstances of arbitrary strictness as with the same circumstances of arbitrary strictness a in most of the other instances. To these we may add in most of the other instances. To these we may add coffee and tea, chocolate and cooo-paste, for which the duty is paid by the retailer; all artifloial wines, commonly called sweets; paper and pasteboard, first when made, and again if stained or printed; malt, as before mentioned; vinegars; and the manufacture of glass, for all of which the duty is paid by the manufacturer; hops, for which the person that gathers them is answerable; candles and soap, which are paid for at the maker's; malt liquors brewed for sale, which are excised at the brewery; eider and perry at the vendor's, and leather and skins eider and perry at the vendor's, and leather and skins at the tenner's." It is unnecessary to enter at length upon the numerous alterations that have from time to time been made in this branch of the revenue. The malt duty was first imposed in 1695. In 1797 the number of exciseable articles was twenty-seven; in 1833 they were reduced to fifteen; and in 1837 to nine, either by the duty being totally repealed or by being trausferred to the management of some other department, by which it might be collected with greater economy and convenience. In 1823 the separate and independent boards of excise for England, Scotland, and Ireland, were conjoined; and in 1849 the excise was united with the stamps and taxes under one board, consisting of a chairman deputy-chairman, and four other commissioners, entitled the Commissioners of Inland Revenue. These have full power to make all necessary rules and regulations, to enforce payments, and to appoint collectors and other subordinate officers. dinate officers, subject always to the control and in-structions of the lords of the Treasury. To facilitate the collection of this branch of the revenue the United the collection of this branch of the revenue the United Kingdom is divided into collections; of which there are fifty-five in England and Wales, thirteen in Scotland, and fifteen in Ireland. Each collection is divided into several districts, and each district is subdivided into rides and footsalks. A ride comprises a considerable tract of country, in which the traders are thinly scattered, and the surveying officer is required to keen a boxes. In towns where the traders subject to keep a horse. In towns, where the traders subject to survey are within a small circuit, the district under one officer is termed a footwalk or division. These survey officers are obliged to keep a minute account of each survey and of every particular connected with it the exact time it commenced, how long it continued, &c. Each district is under the charge of a supervisor, who has thus the superintendence of a certain numshould be continued no longer than to the end of the war. It was first imposed upon the makers and vendors of beer, ale, cider, and perry; but the Parliament soon after laid it on flesh, wine, tobacco, sugar, and a number of other commodities, in pursuance of a plan proposed by Pym, who is considered to have been the inther of the excise; and who, in a letter to Sir John Hotham, easy that they had proceeded in the excise to many particulars, and intended to go on further; but that it would be necessary to use the people to it by checks by surveying after them at uncertain times, examining their accounts, and keeping a diary, in which he inserts the particulars of his own surveys, and the errors which he may have discovered in those of the officers. The chief officer of each collection is termed a collector. He examines the diaries kept by the supervisors, and collects the duties payable in his district. The collector thus surveys the protection is termed a collector thus surveys the protection is district. The collector thus surveys the protection is termed a collector. He examines the diaries kept by the supervisors, and collects the duties payable in his district. The collector thus surveys the protection is termed a collector. He examines the diaries kept by the supervisors, and collects the duties payable in his district. The collector thus surveys the protection is termed a collector. He examines the diaries kept by the supervisors, and collects the duties payable in his district. The collector thus surveys the protection is termed a collector. He examines the diaries kept by the supervisors, and collector thus surveys and the errors which he may have discovered in those of the officers. ber of ride and footwalk officers, whose proceedings

of the system which Mr. Pitt in 1787 pointed at as a model for other public departments, on account of its efficiency and good management. There are also cer-tain classes of officers below the ordinary surveying tain classes of officers below the ordinary surveying officers,—assistants, supernumeraries, and expectants. The traders subject to survey may be divided into four classes:—(1) those visited for the purpose of charging growing duties, as maltsters; (2) those whose license is high or low, according to the extent of their consumption, as brewers and tobacco manufacturers; (3) those subject to a license for dealing in articles upon which excise duty has, or ought to have been paid, as innkeepers; and (4) those subject to a license for dealing in articles on which customs been paid, as innkeepers; and (4) those subject to a license for dealing in articles on which customs duty has, or ought to have been, paid; as dealers in tes or tobacco. The excise was introduced into this country at a time when the attention of the state was directed to the readiest means of raising money, without much regard to its effects upon industry, or the general welfars of the people; and hence a strong prejudice long existed against it, which has not yet quite died out. Dr. Johnson defined it to be "a hateful tax levied upon commodities, and adjudged not by the common judges of property, but by wretches hired common judges of property, but by wretches hired by those to whom the tax is paid;" and Blackstone says that "from its first introduction to the present time its very name has been odious to the people of England." Among the objections to the present excise England. Among the objections to the present excise system, is its interference in many cases with the freedom of the manufacturer in his operations. The officers inspect and control his premises and machinery, take cognizance of every part of the process, and often prescribe the mode of conducting and the time of commencing and completing each operation. It is said that upon the same premises, with the same capital, and the same amount of labour, double the quantity of cloths have been printed that could have been done previous to the repeal of the duty and the consequent removal of ex-cise restrictions; and the duty on glass was avow-edly repealed in order to facilitate improvements in its manufacture. A London distiller stated to the Commissioners of Excise Inquiry, some years ago, that, Commissioners of Excise Inquiry, some years ago, that, assuming that the duties on spirits distilled by him should be fully secured to the revenue, "it would be well worth his while to pay £3,000 a year for the privilege of exemption from excise interferente."

Dr. Ure, in the article "Brewing," in his Dictionary, says,—"As usual, the excise regulations interfere nuch with the progress of this, as of every other manufacwith the progress of this, as of every other manufacwith the progress of this, as of every other manufac-ture under fiscal superintendence. Careful to prevent fraud, they cripple industry, and seek, as it were, to secure the honesty of the labourer by cutting off his hand; ignorant or careless, meanwhile, of the perma-nent mischief which they inflict." Another objection to the present system is the inducement that the high duties, in certain cases, hold out to fraud. The higher the duties, the greater will always be the temptation to defraud the revenue; and all attempts to keep down to defrand the revenue; and an attempts to keep down smuggling, and at the same time maintain high duties, have signally failed. High duties, says Adam Smith, "tempt persons to violate the laws of their country, who are frequently incapable of violating those of natural justice, and who would have been in every respect excellent citizens, had not the laws of their country made that a crime which nature nover meant to be so." These objections can only be removed by country made that a crime which nature never meant to be so." These objections can only be removed by lowering the high duties, and, if necessary, including a greater number of articles. Duties within reasonable limits are uniformly found to be more productive than higher duties, which diminish the demand for the commodity and give encouragement to snuggling. Were light duties the posed upon a number of articles, instead of, as at present, heavy duties on a few, wars of the present restrictions might be removed. many of the present restrictions might be removed many of the present restrictions might be removed; and we believe that a greater sum might thus be raised, with little or no additional expense in collecting. The inducements to fraud would thus, in a great measure, be removed, and more might, with advantage, be trusted to the honour of the manufacturer. Experience also shows that the repeal or reduction of moderate duties, provided they have not interfered with the operations of the manufacturer, does not in a proportional degree render those articles cheaper to the consumers. Again, the excise laws, though in this respect they 808

have been recently much improved, are still characterhave been recently much improved, are still character-ized by great obscurity and complexity, so as to be frequently unintelligible, and even contradictory. It is one of the principles regarding taxation laid down by Adam Smith, that "the time of payment, the man-ner of payment, the quantity to be paid, ought all to be clear and plain to the contributor, and to every other person." But so far from this being the case, there were, in 1836, no fewer than 620 acts of parliament relating to the excise; and at no distant period there were some forty or fifty acts in existence referring to the glass forty or fifty acts in existence referring to the glass duties alone. We believe that were the duties reduced to a reasonable amount, and assessed so as to interfere as little as possible with the operations of the manu-facturer, the laws made concise and intelligible, and the legal proceedings placed on a proper footing, whatthe legal proceedings piaced on a proper footing, whatever prejudices may exist against the excise would speedily disappear; for it enjoys certain advantages over every other mode of taxation. (See Taxation.) The net amount of revenue yielded by the excise duties in 1850 was £14,316,081; in 1855, £16,389,486; and in 1860, £18,189,605. The following table exhibits the 1869, £18,188,695. The following table exhibits the net receipt of the daties of excise in the United Kingdom in the years ended 31st March, 1868 and 1869 (the latest returns). The duties on railways, stage carriages, and racehorses are levied in Great Britain only; and on hackney carriages in London only. The duty on chicory is levied only in England.

Excise	DUTIES.	
	1868.	1869.
Spirits	£10,511,530	£10,556,219
Malt	6,302,418	6,527,708
Hackney carriages	102,416	99,031
Stage carriages	35,556	36,480
Railways	486,142	499,297
Licenses	2,640,238	2,636,208
Racchorses	9,263	9,748
Chicory	21,608	15,910
Sugar, Home-made	7+7	6,340
Sugar used in Brewing	63,370	03,447
Total	£20,173,388	£20,450,386
Net Increase .		£277,098

EXCLAMATION, eks-klii-mai shun (Lat. exclame, I ery out), a term in Gram. susceptible of different signifi-cations, but which is usually accepted as an interjection, signifying sudden emotion, expressive of wonder, alarm, or joy. It is usually uttered by a vehement and sudden extension or elevation of the

EXCOMMENICATION, cks-kom-mu-ne-kai'-shun (Lat.), is an ecclesiastical consure or penalty, by which per-sons who have been guilty of any notorious crime or offence are cut off from the communion of the Church, and deprived of all ecclesiastical privileges. Excommunication is founded upon the natural right of all societies to exclude from their body such as contravene the established laws. The Jews expelled from their synagogue such has had committed any grievous crime; and the same was the practice in the religious system of heathendom. Among the early Christians excommunication was instituted for the purpose of preserving the purity of the Church and enforcing its discipline, though it came afterwards, in the hands of ambitious ecclesiastics, to be used as a means of advancing their own power, and was inflicted on the most frivolous occasions. The power of excommunication was lodged in the hands of the clergy, who distinguished it into the greater and the less. The latter consisted in excluding persons from participation in the Eucharist and the prayers of the faithful; the for-mer deprived them of all the rights of the Church, and even cut them off from the society and conversation of the faithful, no one being allowed to receive an excommunicated person into his house, or to sit at the same table with him. He who was guilty of any intercourse with an excommunicated person, himself incurred the same sentence. Excommunication was early introsame sentence. Excommunication was early intro-duced into England as a means of ecclesiastical pun-ishment; but many then were obstinate and profans-enough to despise the britism fulmen of mere church censures; and so the common law stepped in to sid the Church, and declared that an excommunicated

#### Execution

person is disabled from doing any act that is required to be done by a probus et legalis homo. He thus could not serve upon juries, could not be a witness in any court, and could not bring an action, real or personal, to recover lands or money due to him. And further, if within forty days after the sentence the offender did not submit and abide by the decision of the spiritual court the histon wight cartify such actions. court, the bishop might certify such contempt to the king in chancery; upon which there issued out a writ to the sheriff of the county, called, from the bishop's certificate, a significant, or, from its effects, a writ de excommunicate expiendo; and the sheriff might thereupon take the offender and imprison him in the county gaol till he was reconciled to the Church, and such gaot in ne was reconcined to the Church, and shen reconciliation certified by the bishop; upon which another writ, de excommunicato deliberando issued out of chancery to deliver and release him. But by 53 Geo. III. c. 121, it is declared that no person who shall be pronounced or declared excommunicate shall incur any civil penalty or incapacity in consequence of such excommunication, save such imprisonment, not exceeding six Lionths, as the court pronouncing or declaring such person excommunicate shall direct." By that statute, excommunication can only be pronounced as spiritual censure for offences of ecclesiastical cognizance,—adultery, heresy, simony, and the like; but the practice has long become obsolete.

EXECUTION, cks-c-ku'-shun (Lat. ex, out; secutus, followed), in a general sense, is the performance of any act or duty. In Law, it is the last stage of a suit giving possession of anything recovered at law or in equity after the decision of the court,—the putting in force of the sentence of the court. This is performed by different writs of execution, according to the nature of the action, and of judgment. In ordinary actions, the judgment is, in general, for the recovery of money only, either by way of debt or damages. In such case, the practice of the court allows the judgment-creditor to resort to one of the four following writs of execution:—(1) Writ of capias ad satisfaciendum, to imprison the body of the debtor till satisfaction be made for the debt, or damages and costs; (2) writ of fieri for the debt, or damages and costs; (2) writ of fieri fucias, by which the goods and chattels of the party against whom the jndgment is recovered may be seized upon and sold; (3) writ of levari fucias, which commands the sheriff to levy the debt on the lands and goods of the party against whom it is issued; (4) writ of elegif. (See FLEGIT.) Where the judgment is for the recovery of goods themselves which are detained, there is a special writ of execution, called a distringas, to compel the defendant to deliver the goods by repeated distresses of his chattels, or else scire facius against any third person in whose hands a scire facias against any third person in whose hands they may happen to be, to show cause why they should not be delivered; and if the defendant still continues obstinate, then the sheriff shall summon an inquest, to ascertain the value of the goods and the plaintiff's damages, which shall be levied on the person or goods of the defendant. The 7 & 8 Vict. c. 98, abolished arrest for debts under £20, unless contracted by

EXECUTION OF DREDS is the signing, scaling, and delivery of them by the parties, as their own acts and deeds, in the presence of witnesses. Execution is also the last stage in criminal proceedings,—the de-priving the criminal of his life. (See Capital Punish-Ment.)

EXECUTIVE, eks-ek'-u-tiv, in Pol., is a term applied to a power in 3 state, distinct from the legislative or judicial. The power that deliberates and enacts laws is the legislative, that which judges or applies the laws to particular cases is the judicial, while the executive is that which carries the laws into effect, or superintends the enforcement of them. In England, the executive is that which contribution are superintends the enforcement of them. the executive is, by the constitution, supposed to be vested in the king and such inferior officers as he may appoint.

appoint.

Executors, eks-ek'-u-tor (Fr. exécuteur), is a person intrusted by a testator to carry out the directions and requests in his will, and to dispose of his property, as directed therein, after his decease. When ne executor is named by will, or when those named refuse to act, then the Probate Court nominates certain persons to act as administrators to the deceased. Before probate of the will, an executor may effectually do most

#### Exegesis

of the acts that he could enforce afterwards; but an expected administrator can properly do no act what-ever before obtaining letters of administration. An administrator, after receiving letters of administration, is in most respects in the same position as an executor, and the cases relating to the one apply, in general, to those of the other. In Scots law, administrators are termed executors datios, i.e. appointed by the court; the other class being executors nominate, i.e. appointed by will. The right to nomination as administrators are outerned dation; i.e. appointed by will. appointed by will. In eright to nomination as adminis-trators or executors dutive is, generally speaking, in the order of relationship to the deceased. In England, the widow or next of kin have the first right to be appointed, and, failing them, creditors; in Scotland, persons entitled to the estate by a general settlement have a right to be appointed before others, and then the next of kin. An administrator is required to enter into bond with sureties for the faithful execution of his trust. An executor may refuse to act; but, having once acted, he cannot divest himself of the office or its responsibilities. If a person take upon himself to act as executor without any just authority, as by intermeddling with the goods of the deceased, he is called an executor de son tort, i. e. to his own hurt, and is liable to all the trouble of his office, without any of the profits or advantages; but merely doing acts of necessity or humanity, as locking up the goods, or burying the deceased, will not be so construed. An executor is not entitled to any remuneration for his own personal trouble or loss of time, unless it be expressed in the will. The duties of an executor are expressed in the will. The duties of an executor are to bury the deceased in a suitable manner, to prove the will, and make up an inventory of the personal estate; to collect the goods and chattels of the deceased, and to pay his creditors in the order of legal priority. The legacies are then to be paid as far as the assets extend, observing the distinction between a specific and a general legacy, the residue, if any, going to the next of kin. The office of an executor is one of great trust and responsibility, as he not only repregreat trust and responsibility, as he not only repre-sents the deceased, but is also a trustee for behoof of the creditors, legatees, and next of kin, of the de-cased. He is liable for any loss occurring to the estate ccased. He is hable for any loss occurring to the estate through negligence; for paying sums not due, unless upon decrees; for paying simple-contract creditors before special creditors, or legatees before all the debts are discharged, if there should be any deficiency in the estate. If he intromit with the funds or moverables, so as to lead to a suspicion of fraud, or so as to leave no manner of acceptaining its extent he is liable. leave no means of ascertaining its extent, he is liable for all the debts of the deceased; otherwise, an execu-tor is liable for the debts of the deceased only to the

tor is liable for the debts of the deceased only to the amount of the inventory.

EXEDEA, ets-ed'-rā (Gr. exedra), the name given in ancient architecture to recesses generally furnished with seats, which were placed in the halls and portices of public and private buildings, and in the Roman. baths and Greek palaestræ. They appear to have been similar to the modern alcove, though on a larger scale.

Execuse etra-eig-sig (Gr. Fromer, ext. of execuse).

EXEGESIS, ets-e-je'-sis (Gr., from ex, cut of; egeomat, I lead), properly signifies the exposition or interpretation of any writing, but is almost exclusively confined to the interpretation of the sacred Scriptures. Exegesis is frequently confounded with hermeneutics. This distinction between them is thus given by Dr. Davidson :-- "The meaning of all language, written or spoken, is developed by the application of general laws, usually termed kermeneutics. These principles, in their usually termed kermeneutics. These principles, in their relation to Scripture, are styled sucred kermeneutics; and their application to particular instances has received the name of exegesis." Hermeneutics, then, is the science which lays down the principles of the art of interpretation, and exeges is the application of these principles to particular instances. As the sacred books were written in foreign languages, by authors of a different age, and living in a country different from ours, it is evident, that in order to understand from ours, it is evenent, that in order to understand them thoroughly, requires not only an intimate ac-quaintance of these languages, but also a large mass of historical, recognaphical, and antiquarian knowledge. In the early ages of the Church, several of the fathers distinguished themselves as exegetical authors, as Origen, Chrysostom, Diodorus of Tarsus, and Jerome; but during the middle ages, from the ignorance of the sacred languages that then prevailed, the subject was

#### Exercise

almost entirely neglected. The Reformation revived this study in the labours of Luther, Mclancthon, Calvin, Zwinglius, Bezz, and others. Since that time,

this subject has been receiving more and more attention at the hands of scholars, and never more than in the present day, more especially in Germany.

EXECUSE. (See GYMMASTICS.)

EXETTE COLLEGE, Oxford, eks'-ster, was originally founded in 1314, by Walter de Stapledon, bishop of Exeter, and some time lord high treasurer of England, and was then called Stapledon Hall. The bishop re-moved hither his scholars from Hart Hall, and made a foundation for a rector and twelve fellows. Thirteen fellowships were subsequently added by different donors; but in 1855, under powers granted by 17 & 18 Vict. c. 81, these fellowships were reduced from twentyvice. c. 81, these renowants were reduced rich wenty-five te fifteen, and the restrictions with which they were burdened removed, so that they are now open without any preference with respect to birth. Candi-dates must be members of the Church of England, or of some church in communion with it, and must have essed all the examinations required by the university passed all the examinations required by the division of for the degree of B.A., or have been admitted ad eundem gradum of the university, or have become in any way a member of convocation. From the revenues of eight suppressed fellowships, twenty-two scholar-ships are founded; ten of which are open, ten (called ships are founded; ten of which are open, ten (catted Stapledon scholarships) are limited to persons born or educated in the diocese of Exeter, and two to persons born in any of the Channel islands, or educated at Victoria College, Jersey, or Elizabeth College, Guern-sey. The revenues of the two remaining fellowships were divided among the rectorship and the fifteen fellowships. There are also twenty exhibitions at-taohed to this college, but eleven of them are not in its immediate off. The number of members on the backs immediate gift. The number of members on the books in 1862 was 607.

in 1862 was 607.

EXHALATION. (See EVAPORATION, VAPOUE.)

RHEIETTONS, ART, eks-s-bish'-uns (Lat. exhibitio), displays open to the public, free or otherwise, of the works of living or deceased artists, mostly with the view of gaining purchasers for the paintings and instructing the national character. For more than a century and a half these great incentives to art have been carried out, and art exhibitions have become indeed popular institutions amongst nearly all the nations of Europe. In most European towns these exhibitions take place annually, and in France and England they are, in fact, of more frequent recurrence. In the middle ages, and up to the middle of the 17th century, when art was patronized only by the government, the priesthood, or the nobility of the different nations where art sprung up, the works of artists were deposited in public buildings or churches open to the public, so as to spread the artist's fame, and thus add to his prosperity and reputation; but when private patronage became the artist's mainstay, and when his works, if purchased, would be sure to be buried, as it were, in private houses, where none but a small circle century and a half these great incentives to art have his works, in profused, would be sure to be buried, as it were, in private bouses, where none but a small circle could see them, it became necessary for the artist to have some public exhibition, whereby the public generally might see his works and judge of his talents before they were hidden away in the dwellings of their purchasers. Probably the earliest art exhibition was that which was started by the members of the Academy of Fine Arts at Reme: anything before this could not have been of any open or general character, being conhave been of any open or general character, being con-fined to the works of some particular master and his pupils. That of the French Academy, in the year 1673, was the first art exhibition, in the true sense of the word in which we take it; but this was not place on a very firm basis. In the year 1745 it was once more regularly instituted, and an exhibition of fine arts took place bisensially from that date down to the days of the Revolution. While the days of the barri-cades lasted, it was thrown open to all foreign artists, and in the year 1795 it was restored to the form of a cades lasted, it was thrown open to all foreign artists, and in the year 1796 it was restored to the form of an annual exhibition. In England, however, art was more tardy, for it was not until the year 1769 that the regular exhibitions of the Royal Academy commenced. From that date down to the present time art exhibitions have steadily increased, and in London, in From that dats nown to the present time art ex- 1239 to 2514 inclusive, from the death of Joseph to the hibitious have steadily increased, and in London, insected of one, we can number some ten or twelve art stead of one, we can number some ten or twelve art ording to Rivet, are quoted from Exodusby our Saviour exhibitions which are opened every year. To show the increased sest which these exhibitions have given to sions to the same are made in the New Testament."—

## Exedus

the prosecution of art, it may be stated, that in the the prosecution of art, it may be stated, that in the first exhibition of the Academy in the last century, the number of works exhibited was only 130, and the number of exhibitors 69; while in 1862 the number of exhibitors 69; while in 1862 the number of the thiotical was upwards of 1,000. One of the most memorable of fine-art exhibitions was that of Manchester in the year 1857, which met with a success somewhat similar to that of the Industrial Exhibition of 1851. The value of the works exhibited is stated to have been more than \$6 000 000 and these is stated to have been more than £6,000,000; and these were lent gratuitously by their possessors, in order that the public might obtain a sight of masterpieces which existed, it is true, but whose existence was unknown and unthought of by the world at large. In the Exhibition of 1862, great space was left for the exhibition of fine arts. (For further information see article OR INTERNATIONAL AND INDUSTRIAL EXHIBITIONS.)

EXHIBITIONS, INTERNATIONAL AND INDUSTRIAL. (See International and Industrial Exhibitions.) Exibia, ek.sid'-e-a, in Bot., a gen. of Fungi. The species E. Auricuk Judæ, Jew's ear, is reputed to possess astringent and discutient properties, when appossess astringent and ascurent properties, when applied externally as a decoction or poultice. E. hispadula is used in China as a styptic, and as food mixed in soups and hashes. It is known there under the name of Moghi, which signifies ears of trees.

EXILE. (See BANISHMENT, TRANSPORTATION.)

EXISTENCE, eg.-zis-tens, means the state of being, duration, or continuation. In mental philosophy, it

According to all theories, existence must have been, even of chaos, before the Adamite world, and it will

continue to eternity.

Exit, eg'-zit (from the Latin exire, to go out), signihe str. eg. - i (from the latin extre, to go out), signifies the departure of an actor or player from the stage, when he has performed his part in any particular scene or act. It is also applied to the termination of one's career or state of existence. It is usually placed in the margin of plays, as a guide to the actor or

reader.

Exonus, eks'-o-dus (Gr. exodos, a going out, a de-parture), is the name given to the second book of the Old Testament, as containing a narrative of the de-parture of the children of Israel out of Egypt under parture of the children of Israel out of Egypt under the guidance of Moses. In Hebrew it is termed ve-uleh Shemoth,—'these are the names,'—from the words with which the book begins. Exodus may be divided into two principal parts: (1) Historical (i. 1—xviii. 27), comprising (a) the preparation for the deliverance of Israel from their bondage in Egypt, and (b) the acomplishment of that deliverance; and (2) Legislative (xix. 1—xl. 38). In the first section we have an account of the great increase of Jacob's posterity in the land of Egypt, and their convession under a new dyland of Egypt, and their oppression under a new dynasty, which occupied the throne after the death of Joseph; an account of the birth, education, and flight of Moses; his solemn call to be the deliverer of Israel. and his return to Egypt; his ineffectual attempts to prevail upon Pharaoh to let the people go, the indiction of the ten plagues, and the institution of the passover. Then follows a narrative of their departure out of Egypt, their passage through the Red Sea, with the destruction of Pharaoh and his host in the midst of it; the principal events on the journey from the Red Sea to Mount Sinai; the bitter waters at Marah, the qualis, the manne, the water from the rock at Rephidim, the hattle with the Amalabitas and the await of Tathen battle with the Amalekites, and the arrival of Jethro with Moses's wife and children in the Israelitish camp In the second part of the book we have the promulan one second part of the book we have the promut-gation of the law on Mount Sinai, the preparation of the people by Moses for the renewing of the covenant with God, the promulgation of the moral law, the judicial law, and, lastly, the ceremonial law, including the construction and erection of the tabernacle. In chap, xxxii.—xxxiv. we have an account of the idolatry of the Israelites, the breaking of the two tables of the law, the divine chastisement of the people, and the re-newal of the tables of the covenant. This book "comnewsl of the tables of the covenant. This book "com-prises a history of the events that took place during the period of 145 years, from the year of the world 2309 to 2514 inclusive, from the death of Joseph to the

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## Ex officio

(Horne.) Mr. Horne also adopts the generally received opinion that Moses was the author of this book; but there have been many learned critics, both Jews and Christians, of a contrary opinion. There are many difficulties connected with this book, which have been attempted to be explained in different ways; some bolding that it is the work of a much later author than Moses; others that it is the work of two distinct authors, hiving at different times; a third party that it abounds with interpolations, and so on. This subject has received a fresh interest from the publication, by Dr. Colenso, bishop of Natal, of a work on the Pentatench, in which be gives forth views which are not regarded as orthodox. "I have arrived at the conviction," he says, "as painful to myself at first as it may be to my reader, though painful now no longer under the clear shining of the light of truth, that the Pentateuch, as a whole, cannot possibly have been written by Moses, or whole, cannot possibly have been written by Moses, or by any one acquainted personslly with the facts which it professes to describe; and further, that the (so called) Mosaic narrative, by whomsoever written, and though imparting to us, as I fully believe it does, revelations of the divine will and character, cannot be regarded as historically true." It remains to be seen what arguments are to be brought forward against the history actatometric most of which howevers have the hishop's statements, most of which, however, are not new, and some of them are sufficiently weak. We cannot, however, enter upon the subject, but would refer those who wish to get the arguments in favour of the commonly-received opinions on this subject, to the works of Hengstenberg and Hävernick on the Penta-

EX OFFICIO, eks-of-fish'-e-o (Lat., by reason of office or duty), a term applied to an act done in execution of a power which a person has by virtue of his office. In a power which a person has by virtue of his office. In legal phraseology, ex-officio informations are informations at the suit of the Queen, filed by the attorney-general, by virtue of his office, without applying to the court wherein filed, for leave, or giving the defendant an opportunity of showing cause why it should not be Ex-officio criminal informations are used in official prosecutions in cases of libel, sedition, &c.

EXOGENS, eks'-o-jens (Gr. exo, without; ginomai, I am formed), in Bot., plants with stems that increase by external concentric layers,—as the beech, ash, and oak. The class Exogenæ of some botanists corresponds with the class Dicatyledones (which see).

Exogonium, ex-o-go'-ne-um (Gr. exo, without; gonia, angle), in Bot., a gen. of Convolvulacex. The species E. purga is a native of Mexico, near Chincanquiaco. Its tubercular roots constitute the true jalap of the Materia

Medics, so well known as a purgative.

Exoncism, eks'-or-sizm (Gr. exorkizo, I conjure), is the conjuration of evil spirits, in the name of God or Christ, to depart out of a person possessed. In the early ages of the Church, when persons were about to be haptized, they were called upon to make a solemn renunciation of the devil and all superstitious practices and worship; but afterwards, about the 4th century, when all idolaters came to be looked upon as possessed of devils, it became customary to exorcise them previous to their being baptized. Soon afterthem previous to their being captized. Soon atterwards it came to be a form generally employed in haptism even of children of Christian parents, who were also regarded as possessed by the devil before baptism. The words employed were, "I adjure thee, unclean spirit, that thou come out of this servant of Jesus Christ; in the name of the Father, and the Son, and the Holy Ghost." Exorcism was retained by and the Holy Chost." Exoreism was retained by Luther, but was laid aside by the Reformed church. The Roman Catholics employ exorcism in three dif-ferent cases;—in the administration of baptism, in actual or supposed demoniacal possession, and in the blessing of the chrism and holy water. EXCEDIUM, else-or'-de-um (Lat. exordior), is the intro-

# Expectorants

and directly professes his aim in speaking. In the latter the orator must take a larger compass, and, presuming the disposition of the audience to be against him, he must gradually reconcile them to hearing him before he plainly discovers the point which he has in view.

Excamose, eles-of mose (Gr. ex, out of; osmos, impulsion), the passage from within outwards of fluids or gases through a membranous separation. (See ENDOSMOSE.)

Exostosis, eks-os-to'-sis (Gr., from ex, out of, and osteon, a bone), in Surg., is a term applied to a murbid enlargement or hard tumour of a bone. This term is applied properly only to osseous tumours on the bones, though it is also sometimes applied to other morbid growths. Exostoses are easily d stinguished from other swellings by their being fixed and immovable, and at first unattended with any pain or inconvenience. There are three varieties,—the solid, the hollow, and the foliated. There is no bone that may not become the seat of this disease, though some are much more subject to it than others. No external transment is of our benefit in this disease and when treatment is of any benefit in this disease; and when it is necessary that they be removed, and can be done with safety, it is effected by sawing or cutting.

with safety, it is effected by sawing or cutting.

Exotro, ets-or-ik (Gr. exotikos, foreign), a term applied to the produce of foreign countries. In gardening, exotic plants are those which belong to a soil and climate entirely different to the place where they are raised, and are therefore mostly preserved in green-houses. Exotic plants from hot climates are

green-nouses. Exous plants from not climates are very numerous, and require much attention: without great care, even if they do blossom, it is seldom that they produce fruit, or that their seeds ripen. EXPANSION, eks-pān'-shun (Lat. expansio), a term applied to the enlargement or increase of bulk in bodies, generally produced by heat. This effect is one of the most common and obvious results of the raising of temperature in all bodies, solid and liquid. Among the solids, the metals are the most expansible by heat. Experience has taught our engineers that it is dangerous to confine such a force as this, and that it is necessary to make provision for it in metallic constructions. The arches of Southwark bridge rise and fall about an inch in the usual range of atmospheric temperature, and if provision had not been made for the expansion and contraction of the iron, destructive consequences must have ensued. In most cases, all bodies contract when the temperature is lowered; but there is a remarkable exception to this rule in the case of water, which begins to expand when lowered to 46° Fabr. (See WATER.) The power evolved in the expansion of water is very great. A brass globe having a cavity an inch in diameter can be burst by filling it with water and freezing it, when the absolute force necessary to produce a like result is equal to 27,720 ibs. weight. Aeriform bodies are the most expansible forms of matter, and they all expand and contract

EX PARTE, eks-par'-te (Lat., of one part), in Law, is a phrase used in chancery proceedings, when a commission is taken out and executed by one side or commission is taken out and executed by one side or party, the other party refusing or neglecting to join therein. When both parties join, it is called a joint commission. Hence the term exparts has come to be applied, in common language, to any statement or evidence coming from one of the interested parties. EXPECTORANTS, eks-pek-te-rants (Lat. ex, out of, and pectus, the cheet), is a term applied in Med. to such substances as promote the expulsion of mucus, or other matters, from the air-massaces of the throat and

such substances as promote the expusion of mucus, or other matters, from the air-passages of the throat and chest. The agents that are used with this view are very different, and act in different ways. Vapours are the only agents that can act directly upon the organs affected; those that are taken into the stomach being EXORDIUM, ess-or-de-um (Lat. exerdior), is the intro-duction or opening part of an oration, and, according to Cicero and Quintilian, it ought to have one or other of three ends in view:—(1) to render the hearers bene-volent, or to conciliate their good-will; (2) to excite their attention; or (3) to render them docile, or open to persuasion. An exordium should be easy and na-tural, and drawn either from the subject itself or from the situation of the speaker. The ancients distin-guished two kinds of introductions,—the principium and insimuatio. The former is where the orator plainly pipe, and produce coughing, act as expectorants.

When there is decided inflammation, the best expectorants are such as lessen the inflammatory state; and hence mustard, or a fly-blister, applied to the chest, or venesection, will be found to be of the utmost service. Great care is necessary to be observed in the selection of the particular agent to be employed in each case, and very great injury may be done by having recourse to such as are unsuitable.

EXPERIENCE, eks-pe'-re-ens (Lat. experientia), can strictly speaking, he applied only to what has occurred within a person's own knowledge, and in this sense, of course, can only relate to the past. Thus, a man knows by experience what sufferings he has undergone in a certain disease. Frequently, however, the word is used to denote a judgment derived from experience in its primary sense; and thus only can experience be applied to the future, or any general fact; as when it is said that we know by experience that water at a sertain temperature will freeze.

EXPERIMENT, eks-per-c-ment (Lat. experimentum, an attempt), an operation for the purpose of discovering some unknown truth, principle, or effect, or to establish it when discovered. Experiments are of great importance in physical science, and in chemistry they disclose the qualities of natural bodies.

Experimental Philosophix is that which deduces the laws of nature, the properties of bodies, and their mutual actions upon one another, from experi-ments and observations. The distinction between deductive and experimental philosophy is clearly pointed out in the following quotation from Sir John Herschel:—"A clever man shut up alone and allowed Merschel:—A cieve man show up more an amount mulminited time, might reason out for himself all the truths of mathematics, by proceeding from those simple notions of space and number of which he cannot divest himself without ceasing to think; but he could never tell by any effort of reasoning what would become of a lump of sugar if immersed in water, or what impression would be produced on the Experieye by mixing the colours yellow and blue. mental philosophy is consequently founded on ocular demonstration, or that which cannot be denied without violating common sense or clear perception. INDUCTIVE PRILOSOPHY.)

EXPERIMENTUM CRUCIS, eks-per-e-men'-tum kru'-six (Lat., experiment of the cross), a leading or decisive experiment, either so called on account of its being like a cross or direction-post, placed by the roadside in order to guide travellers in the right path, or on account of its being a kind of torture to elicit the truth, as the cross was used like the rack for that pur-

pose in ancient times.

EXPLOSION, eke-plo'-zhun (Lat. explosio), sudden expansion or bursting of any substance, accompanied by a loud report; as the explosion of gunpowder, an explosion of a steam-boiler, an explosion of gas.

plosion or gas.

Exposization, ex-por-tai-shun (Lat. ex, out, and porto, I carry), the act of sending commodities out of one country into another. (See Communic.)

Ex-root-racro, ets-poat-fak-to (Lat.), a law phrase which is applied to something which has already been

done or proved. For instance, a law is said to be made ex-post-facto when it renders an offence in a manner in which it was not punishable at the time it was committed; that is, a law made for the offence

EXPRESSION, eks-presh-nn.—In the Fine Arts, this term is applied to the representation of the various passions of the mind, as shown in facial devevarious passions of the mind, as shown in facial development. Sir Joshus Reynolds, who may be said to be the father of the English school of painting, directs that all attention must be paid to expression. He says,—"Care must be taken not to run into peculiarities. Those expressions alone should be given to the figures which their respective situations generally produce. Nor is this enough; each person should also have that expression which men of his rank generally whith The document of the proof of a character of rally exhibit. The joy or the grief of a character of digatry is not to be expressed in the same manuer as a similar passion in a vulgar face."

Expugationers Index. (See Index Expurations)

defined to be the power of clearly and forcibly expressing oneself upon any subject without previous preing oneset upon any surject without previous pre-paration, at least as regards the words; for, strictly speaking, every extemporized speech presupposes a preliminary operation of thought. Before extempo-rizing a speech, it is necessary to have the foundation of the discourse fixed in the mind, and the succession of thoughts to be expressed. There should reign between all its parts an order of fliation, or generation, the one idea naturally producing the other; and they should be so disposed, that each may be found in the very place marked out for it, the moment it is required. The great requisite in extempore speaking is to have clear and distinct ideas regarding the subject on which one is shout to speak. In order to speak forcibly and clearly, one must begin by feeling vividly, and then clear ideas on the subject will naturally follow. It should not, however, obtain such possessi in of the mind as to prevent it from acting; for the mind of the mind as to prevent it from acting; for the mind of the apeaker may become so completely absorbed by the contemplation of his subject, as to be unable to enter upon its development. This forms a stumbling-block to many in attempting to become good speakers; and it frequently occurs with men of genius. He, therefore, who would speak well must feel what he has to say, with sufficient strength to express it with warmth and vivacity; but his feeling must not attain that vehemence which prevents the mind from acting, and accuracy the expression from its very fulness. In paralyzes the expression, from its very fulness. speaking, the feelings have to be resolved into ideas, thoughts, images; and these into words, phrases, lan-guage. The main idea of the subject has to be firmly grasped; and in its exposition it has to be divided into its principal parts or members, and these into subordinate parts; and so on, until the subject is exhausted. The imagination is one of the most necessary faculties to the extempore speaker: it ought to be endowed with great quickness in the formation and variation of its pictures, and also with great clearness, in order to produce, at first effort, a well-marked image, the lines and outlines defined with great exactness, and the colours bright, so that language has only to reproduce it unhesitatingly and unconfusedly. In many men, even of talent, the imagination is not sufficiently ready In many men, and clear; it works too slowly, owing either to a natural deficiency, or, more frequently, a want of prac-tice. To many, again, the excitement of appearing in public is so great as to produce a certain incapacity of speaking, not unlike inability to walk from giddiness. The great means of getting over this is to feel per-The great means of getting over this is to feel perfectly sure of what you are going to say, and to have a clear conception of it. The public speaker requires to be able to think methodically; and for that purpose he ought to study logic, and the works of the best authors; he ought, also, to acquire such a mastery over his cwn thought, as to be able to decompose it into its parts, to analyze it into its elements, and then, at need, to re-compose, re-gather, and concentrate it again by a synthetical process. Now, this can only be again by a synthetical process. Now, this can only be well done by writing; and hence, one ought to begin by learning to write, one must write in imitation of the great masters of oratory. Writing gives wonderful clearness and intensity to thought, and enables us to look at a subject in every light. In the consideration of a subject, the best way is first to seize hold of the main idea, and regard it intently for some time, the different faculties of the mind concentrating thems upon this single point; the subject is thus turned over in every direction, and viewed in all its aspects; its principal parts then gradually come out and separate themselves from each other, becoming more and more developed, until they reach their perfect form. The public speaker should have his mind well stored with information on a great variety of subjects, more particularly such as are regarded as forming part of a liberal education; for we can only extemporize what is already in the mind. It is of importance, too, that all we know be strongly conceived, firmly linked togea similar passion in a vulgar face."

Expusedatorius Index. (See Index Expusedatorius,)

Expusedatorius Index. (See Index Expusedatorius,)

Expusedatorius Sprakies, eks-tem'-pore (Lat. ex, and to a certain extent, by maditation. Further, in public temporarius, lasting but for a time, temporary) may be speaking, thought has to be clothed in language; and ther, and carefully wrought out in such a way that,

some attention to this is likewise necessary, in order that the sui-ject may appear in as favourable a dress as possible. For this purpose, one ought to cultivate assiduously that natural desire of communicating to others what he knows, and of making them see things in the same light that he sees them. The mind seizes upon a thing more quickly, and conceives it more clearly, when there is also present to the mind the ides of communicating it to another; and thus, also, a natural desire is fostered for public speaking. In the details of diction, at the moment of public speaking, great decision is necessary, in order to clothe the ideas in proper words as they fly past, and, amidst many unsuitable, to allow none but such as are proper to escape from the lips. The speaker, however, at first ought not to be too nice in this respect; especially, when once he has begun a sentence or an idea, he ought to go on daringly to the end, even though he may have to take refuge in some incorrectness of language, or some unauthorized turn of expression. Decision, and even rashness, are necessary for him who would make a good public speaker. Finally, "the understanding which sees rightly and conceives clearly, and the heart which feels keenly, soon come to find naturally, and without effort, the words and the arrangements most analogous to what is to be expressed."—Ref. The Art of Extempore Speaking, by M. Bantain, 1858.

EXTRNSION, ekc-ten'-shun (Lat. extensio, a stretching) in Logic, is a term used in contrast to comprehen sion, and, as applied to a general notion, it denotes the number of objects included under it. By detach-ing properties from a notion, we extend the list of objects to which it applies; by narrowing the sphere of a notion, the qualities which it comprehends proportionally increase. Thus, the greater the extension of common term, the less the comprehension, and

EXTENT, OF EXTENDI FACIAS, eks-tent', in Law, is a writ of execution issuing out of the court of Exchequer, and directed to the sheriff, against the body, lands, and goods, or the lands only, of a debtor. The sheriff is to cause the lands, &c. to be appraised to their full extended value before he delivers them to the their full extended value before he delivers them to the plaintiff, in order that it may be certainly known how soon the debt will be satisfied. The king, by ancient prerogative, is mittled to this writ in order to recover debts originally due to him, or assigned to the crown. Extents are either in chief, or in aid. In extents in chief, the crown is the real plaintiff against a crown debtor; and under it his body, lands, and goods, may be taken at once. Extents in aid are sued out at the instance and for the benefit of the crown, against the adverse of a covery deliver. the debtor of a crown debtor.

EXTORTION, eks-lor-shun (Fr. extorquer, to draw from by force, from Lat. extorqueo, I wrest from), in Law, is an abuse of public justice, which consists in any officer unlawfully taking, by colour of his office, from any man, any money or thing of value that is not due to him, or more than is due, or before it is due. This is an offence at common law, punishable by fine and imprisonment.

EXTRA, eks'-tră, a Latin preposition, signifying over

and above, in excess; as, extra work, extra pay, &c.

Extra crs, ekr-trakts (Lat. extractus), medicinal
preparations obtained in a variety of ways from vegetable sources. Sometimes they consist of the simple evaporated juices of the fresh plant, and at others they consist of certain principles extracted from the fresh or dried plant by means of a menstruum capable of dissolving them. They are termed watery, alcoholic, acetons, or othereal, according to the menstruum employed. The object is to preserve the principles from putrefaction, which was likely to occur while they remained associated with or dissolved in other portions of the plant. They are also thus more readily used in making pills, &c. The preparation of extracts requires great care. A great improvement was introduced by Mr. Barry in the mode of preparing extracts by evaporating in vacuo. Compound extracts are those

delivery by one nation or state to another of fugitives from justice, in accordance with treaty.

EXTRAVARION, Eds.-frdv-d-ad-j-skun (Lat., from extra, without, and vas, a vessel), in Surg., is a term applied to fluids which are out of their proper vessels or receptacles.
Thus, an extravasation of blood takes place when an artery or vein is injured, and the blood escapes into the cellular membrane; and an extravasation of urine, when, in consequence of a wound or ulceration, that fluid makes its way into the cellular substance, or among the abdominal viscera. Extravasation is distinguished from exudation, in that, in the latter case, the walls of the vessels remain entire, and the fluids escape by secretion. It is nearly synonymous with effusion, but is not so comprehensive. The discoloration that follows contusions is occasioned by the extravasation of blood into the cellular tissue under the skin, from the rupture of small blood-vessels. When the ruptured vessel is large, or situated in a deli-cate part of the body, as in the brain, extravasation is usually fatal.

EXTERME UNCTION, eks-treme' unk'-shun (Lat. ex-tremus, last; unguo, I anoint), is one of the seven sacraments of the Roman Catholic church, founded upon that passage in the Epistle of St. James which says:—"Is any sick among you? let him call for the elders of the church, and let them pray over him, anointing him with oil, in the name of the Lord; and shall raise him up," &c. (v. 14, 15). This passage, it is said by Protestants, has reference only to the miraculous powers which were exercised in the time of the apostles. The rite of unction is frequently alluded to aposties. The rice of unction is inequency sauces by the fathers; but it, at that time, was common to several of the sacraments, and it was also employed as a means of restoring to health, as it is in the Greek church at the present day. It is called "extreme," because it is only for persons at the point of death,—
the closing ceremony of life. It is believed to purify the
soul of the dying person from any sins that he may
have committed, and to give him strength and grace
to encounter the last struggle. It is administered by
the priest, who, dipping his thumb in the holy oil, the priest, who, dipping his thumb in the holy oil, anoints the sick person in the form of the cross, upon the eyes, ears, nose, mouth, hands, and feet, each time saying, —"Through this holy unction, and his most tender mercy, may the Lord pardon thee whatever sins thou hast committed, by thy sight (hearing, &c.) Amen." The holy oil is blessed by the bishop every year with much solemnity, on Maundy Thursday. council of Trent passed several canons on this subject, declaring it to be truly and properly a sacrament in-stituted by Jesus Christ.

EXUVIE, egs-u'-vs-e (Lat.), a word applied to the cast-off skin of any animal, reptile, or shell-fish, which is "shed." The films of sucus thrown off by most molluses and zoophytes must also be regarded as exueve. In insects, the whole integument is shed annually, several times in succession, the last cadyris taking place in the final transition state, from the pupa taking place in the final transition state, from the pupa to the imago. In shell-fish, or crustacea, the external shell is usually cast yearly. The common snake, when confined, draws its skin off annually by means of pres-sure of the folds, and the rattlesnake is said to invert and draw off its own skin. In the more warm-blooded classes, the moulted feathers of birds and the hairs of various species of mammalia may be looked upon as exunia, or exuvial deposite; as also the small scales of what is termed searf-akin, which are continually east off from our way hedise. off from our own bodies.

Exe, 4 (Ang.-Sax.), the organ of vision, is one of the most wonderful and delicate portions of the human the most wonderful and delicate portions of the humas body. It is placed within a bony cavity, termed the orbit, pyramidal in form, with the base anteriorly, and directed a little outwards, and the apex backwards and inwards. The orbit contains the globe of the eye, with numerous muscles, nerves, vessels, fat, &c. The external appendages of the eye are the eyebrows, eyelids, and lachrymal apparatus. The eyebrows, or supercible, are arches of his covering the suing-orbital ridge evaporating in vacuo. Compound extracts are those which are prepared from several plants, and simple extracts from one only.

EXTRADITION, eks-trā-disk'-un (Lat., from ex, and trado, I deliver), denotes the delivery from one nation to another, and is more particularly applied to the

curtains which cover the eye, the one being inferior, the other superior. Where they join outwardly is called the external, and inwardly towards the nose, the internal canthus. The margin of the eyelids, which is cartilaginous, is called tarsus. Along the margin of each eyelid is a row of stiff hairs, termed cilia, or eyelids. lashes, and which serve to keep external bodies out of the eyes, and moderate the influx of light. Within the lids, near their edges, are numerous glandular bodies, named after their discovever, the *Meibomian* glands, and secrete an oily or mucilaginous fluid, which lubricates the eyes and lids, and facilitates their movements. The lacrymal gland is situated in a small depression of the frontal bone near the external canthus, and from it seven or eight canals issue, called the lacrymal ducts, and open on the internal surface of the upper eyelid; it secretes the tears, which then pass along the surface of the eye to the puncta lacrymalia, which are surface of the eye to the puncta tarrymuta, when are two callons orifices or openings, one in each lid, at the internal angle of the tarsus. From the lacrymal points the tears are conveyed by the lacrymal canals into the lacrymal sac, which is a membranous recep-tacle situated in the internal canthus of the eye. The nasal duct is a membranous canal, extending from the inferior part of the lacrymal sac downwards, backwards, and outwards, into the cavity of the nose. lacrymal caruncle (caruncula lacrymalis) is a small fleshy body, of a red colour, composed chiefly of mu-cous follicles, and situated in the internal canthus of the eye. The globe or ball of the eye is composed of membranes or coats, humours, vessels, and nervee. The membrana conjunction, or conjunctive membrane, is a delicate mucous membrane, liming the internal parts of the cyclids, and covers the whole of the anterior part of the globe of the eye. The outermost coat of the eye is the sclerotic (Gr. skleros, hard), so called from its hardness. It is a strong, dense, white, fibrous structure, covering about four-fifths of the ball, and leaving a circular deficiency in front, which is occupied by the covering the strong of the ball, and the covering the strong of by the cornea. The latter, so named from its horny appearance, is the transparent covering in front of the eye, its edges being slightly overlapped by the sclerotic coat. Externally it is covered by the membrana concoat. Externally it is covered by the monitorials con-junctive, and internally it is in contact with the mem-brane of the aqueous humour. It is convex anteriorly and concave posteriorly, and is composed of several lamine, or layers. The choroid membrane is of a black colour, and covers the internal surface of the sclerotic coat, with which it is loosely connected by connective tissue. Near its anterior margin it is thrown into numerous folds or processes, alternately long and abort, and which lie upon the edge of the lens and anterior portion of the vitreous humour: they are called ciliary striae or processes, and conjointly the corpus ciliars. On the outer surface of the choroid are seen the ciliary nerves and long arteries; next com-the veius called, from the peculiar manner of their arrangement, vena vorticosa; next is the tunica Ruyschiana, composed chiefly of ramifications of minute arteries, forming a beautiful network; and next to this is series, forming a beautiful network, and field this is the tunica pigmenti, composed of pigment-cells, usually of a hexagonal form, and secreting on its inner surface the pigmentum nigrum. The retina, or inner coat of the eye, consists of three layers of membranes, the outermost of which, in apposition with the choroid, is an extremely delicate membrane, termed the funica Jacobi. The middle one, tunica nervosa, is in reality the expansion of the optic nerve, and terminates at the edge of the ciliary processes. The inner coat is the edge of the ciliary processes. The inner cost is the fusica vasculosa retina, which is vascular in texture, and contains several minute branches of the central artery of the retina. settery of the retina. On the inner surface of the retina, at the back of the eye, and in a line with the sexis of the globe, is a circular yellow spot, called the limbus lateus, in the centre of which is an apparent orifice, named, after its discoverer, the foramen of Sömmering. The bris (Lat., arainbow), so called from its variety of colour in different individuals, may be regarded as a process of the choroid, with which it is continuous, although the two membranes differ in structure. It is a thin, flat, circular, membranous cursin, handpe vertically in the aqueous humour in front On the inner surface of the stracture. It is a time, i.e., currents, membrands cur-tain, hanging vertically in the aqueous humour in front of the lens, and having a central orifice, termed the pupil, for the transmission of light. Its auterior surface is coloured variously in different individuals,

and its inner surface is lined with a substance resem-bling the pigmentum nigrum, called the uvea. It divides the space between the corner and the lens into two chambers, communicating freely with each other through the pupil. The anterior chamber is about a fifth larger than the posterior, and is lined with a membrane, which secretes the aqueous humour. The external edge of the iris, by uniting with the choroid and selectic costs, forms a greyish circle, termed the ciliary circle or ligament. The iris is muscular in structure, and has great power of contracting or expanding the pupil, so as to admit more or less light into the interior of the cychall. In the anterior and posterior chambers in the great humans of the is the aqueous humour of the eye, which serves to dis-tend the cornes to allow the free motion of the iris, and to direct the rays of light as they pass through it. The crystalline lens is a transparent body situated behind and opposite to the pupil, while its posterior surface is received into a corresponding depression on the fore-part of the vitreous humour. In form it is double convex, the posterior surface being more convex than the anterior; and it is invested by a transparent membrane called the capsule, which contains also a small quantity of fluid, called the liquor Mor-gayns. The lens consists of concentric lamine, formed upon a hard, firm nucleus, and becoming softer as they tend to the outer surface. The vitreous humour, or corpus vitreum, lies in the concavity of the retins, eccupying about four-fifths of the eye posteriorly, and being perfectly transparent. It is inclosed in the hyaloid membrane, which also seads numerous processes invarids, so as to divide it into a numerous processes inwards, so as to divide it into a number of cells, and to equalize the pressure exerted on the different parts. It is ponetrated by branches of the central artery of the retina. The eyeball is moved about in its orbit by six muscles, four of which are straight (recti) and two oblique,—the superior and inferior. The four recti muncles have their origin at the apex of the orbit, and are inserted into the sclerotic coat near the cornea, above, below, and on either side. When acting together, they tend to fix and retract the eye; when together, they tend to it and retract the eye; when separately, to raise, depress, or turn it to one side or the other. The superior oblique rises with the straight muscles, proceeds forwards to the upper edge of the orbit, where it passes through a small pulley of bone or cartilage, by which its direction is changed; and its course is then backwards, outwards, and downwards, to be inserted into the scienotic coat. It serves to draw the eye downwards and outwards. The inferior oblique arises from a unute depression in the orbital plate of the superior maxillary bone, just within the margin of the orbit, at its lower part, whence it passes backwards, outwards, and upwards, to be inserted into the sclerotic, at its posterior part. Its action is to direct the eye upwards and inwards. The optic nerves, or second pair, after uniting to form the optic com-missure, in which some of the fibres of each nerve cross to the opposite side, separate, and enter the optic foramen at the aper of the orbit. They pass through the sclerotic coat on the inner side of and below the axis of the eye, then through the choroid, and arread themselves out and are lost or terminate and spread themselves out, and are lost or terminate in the retina. Branches of the third, fourth, fifth, and sixth pairs of nerves also proceed to the eye, for regulating the movements, &c. of the different parts. In sight, then, the rays of light in passing through the cornea are converged, so as to pass through the rela-tively small pupil, and impinge upon the lens, which, by the convexity of its surface and its greater density towards the centre, serves to converge the rays, and to correct the aberration. They then traverse the vitreous humour, and strike upon the retina. OPTICS.)

OPTICS.)

EYE, DISEASES OF THE.—This organ, from its delicacy and the numerous parts of which it is composed, is subject to a great variety of diseases, most of which will be noticed under their own names in different parts of this work. (See AMAUROSIS, OPERMALMYA, &c.) We shall here, therefore, only give an account of cataract, which has been referred to this place. It is derived from the Greek verb katarasso, I disturb or confound, and is usually defined to be a weakness or interruption of sight, produced by opacity of the arystalline lens or its capsule. Sometimes it is applied to every perceptible obstacle to vision situated in the

#### Ezekiel

posterior chamber between the vitreous humour and the uses. When the disease is situated in the uses of its capsule, it is called a true cataract; but when it contact in front of the lens, it sists of opaque matter deposited in front of the lens, it is termed spurious. The latter arises from inflamis torned spurious. The latter arises from inflammation, and is to be treated by the usual means employed for allaying inflammation; but no operation can be of use in such a case. Of true caleract three kinds are distinguished;—lenticular, affecting the lens aloue; capsular, affecting the capsule; and capsulationing both lens and capsule. Lenticular cataracts are of two kinds,—hard and soft; ticular cataracts are of two kinds,—Aura and soft; the former being the more common, especially ameng elderly persons, and is usually of an amber-colour or brownish tint, and generally deep in proportion to its firmness. Soft oataract prevails in childhood and middle life, and occurs more frequently single than the other. A cataract may be occasioned by active inflammation or external violence, or it may be a compared to the common causes. Frequently arise from internal or unknown causes. Frequently it proceeds from an hereditary disposition which has existed for several successive generations, and some-times it attacks several members of the same family, without any evidence of its being hereditary. The habitual examination of minute objects in a depending position of the head, by which an undue proportion of blood is thrown upon the organ, is said irequently to bring on cataract. It may make its appearance at any age, but is most arequent in elderly persons, though children are by no means exempt from it, and may be even born with it. It comes on without pain, and the symptom first perceived is a dim haziness of sight, as if a mist or thin film were interposed between the object and the eye. The obscurity is greatest in direct vision, the opacity being almost always first noticed in the centre of the pupil. Hence the sight is better in a weak than in a strong light, because in the former case the pupil is enlarged, and admits the passage of the rays through the less opaque edge of the lens. Hence, too, the remarkable effect produced by the application of belladonna to the eye, which has the power of dilating the pupil and producing a temporary improvement in the sight,—a means sometimes bring on cataract. It may make its appearance at porary improvement in the sight,—s means contained had recourse to by quacks, who profess to be able to cure this disease. There is no medicinal remedy that cure this disease. There is no medicinal remedy that is known to have any effect upon this disease, nor is it at all likely, from the structure of the parts, that all likely, from the structure of the parts, that any such remedy exists. All palliative measures, therefore, are confined to attention to the general health of the patient and the removal of any inflammatory symptoms that may exist along with it. The only mode of care is actual removal by an operaonly mode of one is actual removal by an opera-tion; but so long as one eye remains unaffected, the operation may be delayed. There are three modes of operation employed for the removal of cataract, each of which has its advocates, and any one of which may be best, according to circumstances. The first is by extraction, or the removal of the lens, and is effected by making an incision through the cornea as near the iris as possible, and then, by means of a needle, opening the front of the capsule, and gently removing the lens. The second method is the displacement of the lens from the axis of vision by what is called outshing [Fr. outsher, to lie down) or depression. A needle is inserted through the fore part of the white of the eye, and is brought to bear upon the lens, pressing it back and down into the vitreous humour; and the opaque body being thus removed, sight is restored. The third

body being thus removed, sight is restored. The third method,—by absorption, is effected by uncturing the front of the capsule, and thus admitting the aqueous humour to act upon the cateract; by which means it is absorbed. All these operations require great care and skill in the operator, and the setting in of inflammation has to be specially guarded against.

Ezzette, e.e.e.ke.e.e (Heb., God strengthens), is the name of one of the canonical books of the Old Testament, placed after the book of Lamentations, and before that of Daniel. It is named after its author, Ezskiel, who was carried away by Nebuchadnezzar into Mesopotamia in the first Babylonish captivity, and is stated to have commenced his prophesying in and is stated to have commenced his prophesying in the fifth year of his captivity (about s.c. 59). The been at a book consists of forty-eight chapters, and naturally there are divides itself into two equal halves; the first contain-

# Ezra, Book of

ing oracles before the fall of Jerusalem; the last, oracles after that event,—the catastrophe in question forming the centre and culminating point of the book. In the first part we have (i) an account of Ezekiel's call to the prophetic office, his commission, instructions, and encouragements for performing the duties (i.—iii. 21); (2) a circumstantial announcement of the destruction coming upon Judah and Jerusalem, on account of the relative to the transmitted of the relative to the control of the relative to the relative the destruction coming upon Judah and Jerusalem, on account of the wickedness of the people (iii. 22-wii.);
(3) a cycle of visions and prophetic discourses, relating to the rejection of the covenant people, with a copious description of the guilt of the people, their rulers, priests, and false prophets (viii.—xix.); (5) several discourses reproving the idolatry of the people, and proclaiming the fearful judgment coming upon Jerusalem (xx.—xxiii.); (5) the destruction of Jerusalem and its inhabitants is figuratively delineated (xxiv.). The second part opens with prophecies salem and its inhabitants is figuratively delineated (xxiv.). The second part opens with prophecies against the Ammonites, Moabites, Edomites, and Philistines; (2) we have a prophecy against Tyre and Sidon (xxv.—xxviii.); (3) a prophecy against Tyre and (xxiv.—xxxiii.); (4) predictions respecting the restoration of the theorracy; (a) of the future salvation of Israel, in its conditions and basis (xxxiii.—xxxvi.); (b) in its development, from the reanimation of the people to their victory over all enemies of the Divine king. dom (xxvii.—xxiix.); (c) the renewal and glorifica-tion of the theoracy in the Massianic period (21.— xviii.).—(Horne's Introduction.) There are so few grounds for doubting the genuineness of this book, that its authenticity has been very little called in ques tion. Ezekiel seems to have been admirably fitted by natural disposition, as well as by spiritual endowments, to contend with the "rebellious house," the "people of stubborn front and hard heart," to whom he was of stubborn front and nard neart, to whom he was sent. With force, fire, and vehemence, he performs the functions of the prophetic office, throwing his whole soul into the work. He is deep, vehement, tragical; and the only sensation which he affects to excite is the terrible. "His sentiments are clevated, fervid, full of fire, indignation; his imagery is crowded, fervid, full of fire, indignation; his imagery is crowded, magnificent, terrific; his language is poupous, solemn, austere, rough, and at times unpolished, sometimes almost to disgust; he employs frequent repetitions, not for the sake of grace or elegance, but from the vehemence of passion and indignation. Whatever subject he treats of, that he sedulously pursues; from that he rarely departs, but cleaves, as it were, to it; whence the connection is, in general, evident and well preserved."—(Lowth.) The vigour and definiteness of his conceptions, down even to the minutest parts, is very marked. very marked.

very marked.

Eza, Book of, ez'-rū, stands next after the second book of Chronicles, and before the book of Nehemiah, among the canonical writings of the Old Testament. It has generally, both by Jews and Christians, been attributed to the priest whose name it bears; chiefly because, in ch. viii. and ix., the actions of Exra are related in the first person. It is a continuation of Jewish history, from the close of the book of Chronicles; giving an account of the post-exile history of that people; from their return out of captivity under Zerubbabel and Joshus till the arrival of Exra in Jerusalem. and the reformatory measures set on foot by salem, and the reformatory measures set on foot by him in the new colony. The events narrated in the hook occupy a period of about seventy-nine years (B.c. 538—457). It contains (1) the edict of Cyrus, permitting the Jews to return into Judæs and rebuild the mitting the Jews to return into Judges and rebuild the temple, with an account of the people who first returned under the leadership of Zerubbshesl, and of their offerings towards rebuilding the temple (i. ii.); (2) the building commenced (iii.); (3) hindrances from the Samaritans (iv.); (4) the temple finished in the sixth year of Darius Hystaspes, by the aid of a decree issued in the second year of his reign, and dedicated (v. vi.); (5) the departure of Ears from Babylon, with a commission from Artarerres Longimanus (vii.); (6) account of his companious, and arrival at Jerusalem (viii.); (7) narrative of the reformation effected by him (ix.x.). The book of Nehemiah is sometimes called the second book of Ezra, the two having been at one time connected together; besides which there are two specryphal books of that name. (Sce EBURAS.)

F.

F is the sixth letter and fourth consonant of the English alphabet, as it is also of the Latin. Its form is taken from the digamma of the ancient Greek alphabet, and it corresponds with the vau of the Hebrew. It is pronounced by bringing the upper teeth against the lower lip, and then breathing with a hissing sound. It is thus what is termed a labio-dental aspirate, and bears the same relation to the other labio-dental aspirate v that the unaspirated labials p and b bear to each other. F and v are frequently inter-changed, and in German v has the sound of f,—as von. sounded fon; hence, in English words taken from the German, ftakes the place of v. — as vater, father; vier, four. In Latin, f seems to have had a sound somewhat corresponding to a strongly-aspirated \( \hat{k}\); for we find the latter frequently substituted for the former in sind the latter frequently substituted for the former in the Sabine dialect of that language; and in Spanish, the Latin f is frequently changed into h,—as Latin for-mosus, beautiful; Spanish, hermoso. The phi in Greck was often in Latin represented by f instead of ph,—as pheme, fuma; and this is frequently done in Italian and Spanish,—as filosofia, philosophy. F in Latin also corresponded to the in Greck,—as Gr. ther. Lat. fera, a wild heart. Fin Latin and Grash often heavenet him wild beast. F in Latin and Greek often becomes & in English,—as frater, brother; and p in Latin and Greek, f in English,—as pater, father. F, in Mus., is the fourth note of the natural distonic scale. It is also used as an abbreviation for forte, strong or loud, the superlative fortissime being denoted by f.

superlative fortissimo being denoted by f.

Fans, fui-ba (from Gr. phago, I eut), in Bot., the
Bean, a gen. of the nat. ord. Leguminosæ, sub-ord.

Papilionaceæ. From the species f. vulgaris, formerly
regarded as Vicia fuba, all the cultivated varieties of
the broad bean have been produced. The earliest
garden variety is named the Mazagan, and the largest
the Windsor. Of the field bean there are two sorts,
the smaller being called ticks. Beans are largely used in feeding cattle, and are very nutritions. The garden beens form an important article of human food.

FABACEM, fui-bai'-se-e, a synonym for the nat. ord.

Leguminosa (which see).

ABIAN, fui'-be-un, an adjective expressive of delayelaying or dilatory. Its real acceptation is avoiding battle, in imitation of Q. Fabius Maximus, a Roman general, who, while conducting operations against Hamibal in one of the Punic wars, only kept on harassing Hamibal by ambuscades and forays, without giving the Carthaginian general an opportunity of open battle. It thus is read to avoid the conductive or dilators conduct.

It thus is used to express delay or dilatory conduct.

FABLE, fui'bl (Lat. fabula), denotes, in its most general sense, any fictitious narrative; but more particularly it is a short fictitious story, intended to convey practical rules of worldly prudence or wisdom, by imaginary representations drawn from the physical or external world. It differs from a parable, with which it has many features in common, in being carried which it has many features in common, in being carried beyond the bounds of the probable, and even of the possible. In the Esopean fable, the imagined actors, or the chief of them, instead of being men, are the lower animals, and sometimes even plants, or other things really inanimate. The fable consists, properly, of two parts,—the symbolical representation and the application, or the instruction intended to be deduced from it, which latter is called the moral of the tale; that it caucht also to be avanced in the fable itself in but it ought also to be apparent in the fable itself, in order to render it complete. On account of its aim, it order to render it complete. On account of its aim, it lies upon the borders of poetry and prose. By its very impossibility, the fable awakens and arrests the attention, and thus the meaning that is intended to be conveyed is made the more apparent. The oldest fables are believed to belong to the East; and of these the most celebrated are the Indian fables of Pilipay, or Bilpai; and the more meagre Arabic collection attributed to Lokman, who is said to have lived in the time of king David. Among the Greeks, the fables of Reop are well known; but not a few of those that were current in Greece under his name are identical with those of the East. In Latin, Phedrus has left about hinety fables of considerable merit in imitation of Reop; but the well-known fables of "the town mouse

and country mouse," related by Horsee, is the best in that language. During the middle ages, the fable does not seem to have been entirely neglected; and an edition of those current in Germany in the time of the edition of those current in Germany in the time of the Minnesingers has been published by Bodmes. The oldest known writer of fables in Germany is Stricker, who flourished about the middle of the 13th century; and among the most distinguished of the later writers of that country are Gellert, Gleim, and Lessing. In England, the most distinguished name in this walk is John Guy; and in France, pre-eminent among all the moderns for his delicate sarcasm and lively wit, is La Fontaine.

FACADE, fas-sade' (Fr.), in Arch., a term used to express the face or front of any building of importance. It may be applied to any side of a large quadrangular building embellished with sufficiently striking architectural features, but it is usually confined to the principal front, in which the chief entrance is most frequently, if not always, situated.

Face, fais (Fr. face, Lat. facies, Ital. faccia), in Cryst, the terminal planes of a regular solid: thus

the cube has six faces, or flat surfaces.

FACE. (See PHYSIGGEOM.)

FACE., fw.-set, in Min., a term applied to the small faces of a gum or crystal. When precious stones are cut with numerous faces, they are said to be facetted, in contradistinction to those polished into rounded

forms or cut en cabochon.

FACIA, fai'-she-ā (Lat. facies, a face), in Arch., a name often given to flat bands or fillets introduced into architectural embellishments, but more frequently applied to the bands of an architrave, which are so placed that the one above projects beyond the surface of that which is immediately below it. In the archi-trave of the Composite order of architecture two facias are generally used, while in the Corinthian, and some-times in the Ionic order, three are introduced. A pictorial representation of the facia will be found in the engraving illustrating the article ENTABLATURE.

(See ENTABLATUBE.)
FACIAL ANGLE. (See ETHNOLOGY.)

FAC-SIMILE, fik-sim'-e-le (Lat., from facio, I make, and similis, like), denotes an exact initiation of an original in all its traits and peculiarities, a copy as accurate as possible. It is chiefly used in relation to copies of old manuscripts, or of the handwriting of famous men, or of interesting documents, which are

rande men, or of interesting documents, when are made by engraving or lithography.

Faction, fak'-shun (Lat. factio), is a term applied in a bad senso to any party in a state that offers uncompromising opposition to the measures of the government, or that endeavours to excite public dis-

content upon unreasonable grounds.

FACTOR. (See AGENT.)
FACTOR, fak-tor (Lat. facere, to form), in Alg. and
Arith., a term applied to each of the quantities which are multiplied into one another; in other words, to the are multiplied into one another; in other words, to the multiplicand and the multiplier, in order to form a product. The term factor is also used in the same sense as divisor; so that any quantity that will divide another is a factor of it. The entire factors of 12 are 1, 2, 3, 4, and 6. Taken in pairs, the factors are 1×12, 2×6, 3×4, &c. The prime factors of a quantity are those factors which cannot be exactly divided by any other quantity except 1. Every number has 1 for a prime factor.

prime factor. Factors, fik'-to-re, in a general sense, any building where cotton, wool, silk, flax, hair, henre, jute, or tow, are manufactured by machinery worked by steam, water, or some other power. The factory system, at it is called, dates from the introduction of Arkwright's it is called, dates from the introduction of Arkwright's spinning machinery. After that time large numbers of workmen met together at the new cotton-mills. It is in this branch of manufacture that the factory system has been most developed. The advantages gained, are the subdivision of labour according to skill and strength, and that of applying to each process exactly the farce that is necessary. Up to the year 1833, the employment of children in factories was much abused; they were employed by workmen whose wages depended greatly upon juvenile labour, and who consequently overtasked their strength and permanently injured their constitutions. A parliamentary committee investigated this subject in 1832; and a committee investigated this subject in 1832; and a

### Factory Acts

mission was appointed to examine the mills themselves. mission was appointed to examine the mills themselves. An act for regulating factories was passed the next year. (See Facrosz Acrs.) In North America, spinning and weaving factories are much more frequently owned by joint-stock companies than in England. Some of them are very large, and the workmen and work-women hold a higher social position than in England. Many of the factories have boarding-houses attached to them, in which many of the operatives. attached to them, in which many of the operatives, especially young women and girls away from home, are boarded and lodged under a well-conducted system. The word factory was first applied to large aggregations of workpeople in one building during Arkwright's time. At that period it signified an establishment of merchants and factors in foreign countries. These factories were governed by several rules adopted for their own support, and in order to protect them from the interference of the governments of the countries in which they resided. In modern times these factories have rly ceased to exist. The mode in which they were instituted seems to have been, that they first had a liberty to trade, then a district was assigned to them, in which they were exempt from the jurisdiction of the native courts. The English, at an early period, formed factories in China, which still exist. Factories have also been established by the Venetians, Genoese, Por-

tuguese, Dutch, and French. ACTORY ACTS are certain acts of parliament, which have been passed from time to time, regulating the employment of labour in these establishments. In 1832, in consequence of the numerous complaints that were made regarding the injurious effects of factory labour on the health of the labourers, particularly the young employed in them, a parliamentary committee was appointed to investigate the subject; and subsequently a commission was named to inquire on the spot into the actual condition of the operatives. At-tempts had previously been made in 1802, 1816, and 1831, to legislate on the subject; but only on a small scale. In consequence of the report of the commission, 3 & 4 Will. IV. c. 103 (1983), was passed, declaring, that after January 1, 1834, no person under 18 years of age shall be allowed to work in the night (i. e. between 8.30 p.m. and 5.30 a.m.) in any cotton or other factory, excepting in lace factories; that no person under 18 shall be employed more than 12 hours in one day, or 69 hours in one week; that 1½ hour daily be allowed for meals to each person restricted to 12 hours work; that no child shall be employed, except in silk-mills, under nine years of age; that after March 1, 1834, no child under 11 years old shall be employed in any factory, except in silk-mills, more than 48 hours in any one week, nor more than sine hours in any day,—nor after March 1, 1835, who shall not be 12 years old,—nor after March 1, 1836, who shall not be 13 years old; that children and young persons, whose hours of work are regulated, shall be entitled to two holidays and eight half-holidays shall be entitled to two noncays and eight nationarys in every year; that children, whose hours of work are restricted to nine hours a day, are not to be employed without a certificate from a physician or surgeon, certifying that they are of the ordinary strength and appearance of children of these ages; the crown to appoint four inspectors, with extensive powers, to see that the various provisions of the act are carried out. to make rules necessary for its execution, and to enforce attendance at school, for at least two hours daily out of six days in the week, of children employed in the factories. The following year, a short explana-tory act was passed; but nothing further was done till 1844, when 7 & 8 Vict. c. 15, became law. By this act, the powers and duties of inspectors are more accurately set forth; and an office of factory-inspec-tors is established in London; regulations are laid down for the protection of children in wet-flax spinning, and from accidents by the machinery while in motion: a child is defined to mean a person under 13, and a young person, one between the ages of 13 and 18; children may be employed at eight years of age; all 18; children may be employed at signt years of age; au mount of daily work for each child is seven hours; work for children and young persons is to cease on Saturday at half-past four; and certain provisions are made regarding the meal-times. By 10 Vict. c. 29, the hours of labour for young persons, and women

# Fagus

above 19, are reduced to 11 hours a day, after July 1, 1847, and 10 hours after May 1, 1848; and by 16 & 17 Vict. c. 102, children are not to be employed before six in the morning, or after six in the evening, or after two on Saturday. In 1856, an act was passed as to mill-gearing, limiting the fencing to such parts of the machinery as children and young persons are liable to be injured by.

FACULTIES, COURT OF, fük-ul-ties, a court established by 25 Henry VIII. c. 21, under the archbishop of Canterbury, and having power to grant faculties, privileges, indulgences, dispensations, licenses, and the like, connected with ecclesiastical matters. Now the business of the court is chiefly confined to grant-

ing licenses to marry.

FACULTY, fük'-ul-te (Lat. facultas), in Phil., is commonly applied to those active powers of the mind which are original and natural, and which make part of the constitution of the mind. Capacity, on the other hand, is applied to those manifestations of mind other nand, is applied to those manifestations of mind in which it is generally regarded as passive, as affected or acted upon by something external to itself. "Powers natural and active," says Sir W. Hamilton, "are called faculties. Powers natural and passive, capacities or receptivities. Powers acquired are habits, and habit is used both in an active and passive sense. The power again of soquiring a habit is called a disposition." When philosophers thus classife the sense. The power again of acquiring a maniferance and adaposition." When philosophers thus classify the different operations of the mind, and assign them to different powers, it is not to be supposed that they regard the mind as made up of so many distinct parts. The mind manifests itself in different ways, and it is only these manifestations that they arrange and classify. When, therefore, they speak of a power or faculty of the mind, they only mean that certain operations the mind have been observed and classified, according to the conditions and circumstances under which they manifest themselves. "This way of speaking of facul-ties," says Lucke, "has misled many into a confused notion of so many distinct agents in us, which had their several provinces and authorities, and did command, obey, and perform several actions, as so many distinct beings: which has been no small occasion of wrangling, obscurity, and uncertainty, in questions relating to them."

relating to them."

FACULTY, in a university, is one of the particular departments of teaching. In most universities there are four faculties; viz. arts, law, medicine, and theology. (See UNIVERSITIES.)

FAGGING, fäg'-ging (Ang.-Sax.), is a term applied to a system of servitude which was at one time general in the higher sobools of this country, and which has not yet entirely disappeared. It consists in the junior boys, or those of the lower school, as it is called, being compelled to act as servants or "fags" to the older or more advanced pupils. The fag is under entire subjection to his master, having to attend to his fire, prepare his meals, brush his clothes, and perform other menial duties. Several attempts have of late vears menial duties. Several attempts have of late years been made to abolish this barbarous custom, and it is hoped that it will soon entirely disappear.

FAGGOT, or FAGOT, füg-got (Fr. fagot, Armoric and Welsh fagod), is generally a bundle of sticks or small branches of trees bound together. In times of religious persecution the faggot was a badge worn on the sleeve of the upper garment of such persons as had ab-jured heresy, being put on after the person had pub-licly carried a faggot to some appointed place by way of penance. To leave off the wearing of this badge sometimes regarded as a sign of spostasy. Among military men faggots were persons hired by officers whose companies were not full, to muster and hide the deficiencies of the company, and thus cheat the government of so much money. Faggot votes, in politics, were votes created by the partitioning of an estate into numerous small tenements, which were let to persons at an almost nominal rent, upon condition of voting at elections according to the dictates of the lessor.

FAGOPYRUM, fai-go-pi'-rum, in Bot., the Buckwheat, a gen. of Polygonaces. The fruits of F. esculentum and tataricum are used as a substitute for corn in the north of Asis and eastern Europe. The former species is outlivated in Britain as food for pheasants.

FACUS, fai-gus (from Gr. phage, I eat), in Bot., the Beech, a gen. of the nat. ord. Corplaces. F. sylvation,

### Fahrenheit's Thermometer-Scale

the common beech, is one of our noblest forest trees This and F. americans are much valued for their timber. The fruits (beech-mast) form a food for pigs. The fruit of F. ferrugines is eaten in North America for dessert.

FARRENHEIT'S THERMOMETER-SCALE, (See THER MOMETER.)

FAINTING, or SYNCOPE, faint'-ing, sin'-kope (Irish faine, a weakening; Gr., from sun, with, and kopto, I iall down), in Pathol., is a sudden and total or partial unconsciousness, resulting from impaired circulation of the blood through the brain, occasioned commonly by diminished action of the heart. The functions of the nervous system, respiration, and the action of the heart, are either suspended or very much diminished in strong mental emotion, loss of blood, severe pain, or anything which tends to diminish the vital energy of the system. Usually the patient is first conscious of a singing in the ears, then the sight becomes confused and all the senses deadened; the countenance becomes and an the series feathered; the contensate becomes deadly pale, and the limbs are unable to support the weight of the body, which sinks to the carth. Fainting, if occasioned by a diseased state of the brain or heart, or if prolonged, may result in death; but if arising from any trivial cause, the patient in general speedily recovers. The patient should be laid on his back with his head low and his dress located about back, with his head low, and his dress loosened about the neck; abundance of fresh air should be admitted

to him, and cold water may be sprinkled on his face and neck, or ammonia applied to the nostrils. Fals, fair (Fr. foire, Welsh fair, Lat. forum, a market-place), is a larger species of market, which is held at more distant intervals, and sometimes devoted to one species of merchandise, sometimes to several. In the earlier stages of society, and in inland countries where the facilities for commerce are comparatively circumscribed, the bringing together of commodities and dealers at certain times and in convenient places is of the utmost importance; and for this purpose various privileges have been annexed to fairs, and numerous facilities afforded for the disposal of pro-perty in them. In this country no fair can be held without a grant from the crown, or a prescription which supposes such grant; and before a patent is granted, it is usual to have a writ of ad quod damnum executed and returned, that it may not be issued to the prejudice of a similar establishment already existing. If her Majesty grant power to hold a fair or market in a particular place, the lieges can resort to no other, even though it should be inconvenient; but if no place be appointed, then the grantees may hold it where they find it to be most convenient. Formerly courts were established in connection with fairs, commonly called pie poudre, in allusion to the dusty feet of the suitors, where summary judgment was administered on all matters of dispute arising from transactions at the fair. In this country the fairs have lost much of their ancient In this country the tairs have lost much of their ancient splendour, and many of them have all but disappeared. The growth of towns, and the facilities afforded for the disposal and purchase of all kinds of produce, have rendered them much less uccessary now than formerly. Those that are chiefly of use in the present day, and which have least declined, are the cattle and horse The August fair of Hornoastle, in Lincolnshire, is the largest horse fair in the kingdom, many thousand is the largest horse fair in the kingdom, many thousand horses being exhibited for sale at it. St. Faith's, near Norwich (Oct. 17), is the principal English fair for Scotch esttle; and Weyhill fair, in Hampshire (Oct. 10), has probably the greatest display of sheep of any fair in the kingdom. Falkirk fair or tryst is one of the most important in Scotland for the sale of cattle and sheep; and hardly inferior to it are those of McIrose and Lockerly. In Germany, the principal fairs are those of Leipsic, Frankfort-on-the-Maine, and Frank-fort-on-the-Oder. In France, that of Beaucaire was fort-on-the-Oder. In France, that of Beaucaire was formerly the largest in Europe, and is still frequented by a vast concourse of people. The great fair of Nishnij-Novgorod, in Russis, is at present the most important in Europe, being frequented by buyers and sellers from different parts of Europe and Northern and Central Asia. Another celebrated Russian fair is that of Kinchta, on the Chinese frontier, where the greater part of the commerce between the Chinese and Russian empires is transacted. A large fair is held at

### Faith

Mecca during the resort of pilgrims to that place.— Ref. McCulloch's Commercial Dictionary.

FAIRIES, or ELUES, fair'ees, elvz (Ger. elfe, Sw. elf, Dan. ellefolk, Old Norse alf), are supernatural beings, Dan. etteroth, the Norse act /, are supernatural senge, of human shape, of both seres, and generally of very diminutive size. The name fairy is derived from the Latin fatum, fate; and hence the Italian name of this class of beings is fata. Elf is derived from the Old Norse alp, or alf, which signifies both a mountain and a demon of the mountains. The Anglo-Saxoss had their dun-actionne, or fairies of the mountains; wuldactions, or fairies of the woods; water-actions, or fairies of the fountains. They are thus classed by Shakspeare :-

Ye elves of hills, brooks, standing lakes, and groves, And ye that on the sands with printless foot Do chase the ebbing Neptune, and do fiee him When he comes back."—Tempest, act v. sc. 1.

The general belief is that the native land of fairy mythology is Arabia, and that our knowledge of these beings was brought from that country by the Crusaders; but there can be no doubt that their origin is much more sucient. They are generally believed to be a kind of intermediate beings, partaking both of the na-ture of men and spirits, having material bodies, and yet possessed of the power of making themselves invisible, and of passing through any sort of inclosure. They are remarkably small in stature, with fair com-plexions, and generally clothed in green. Their hunts were believed to be groves, verdant meadows, and the slopes of hills, and their great diversion dancing handin-hand in a circle, as alluded to in Midsummer Night's Dreum. The traces of their tiny feet are supposed to remain visible in the grass long afterwards, and are called Fairy Rings or Circles (which see). They were regarded as of a doubtful character, being sometimes benevolent and sometimes mischievous. The diseases of cattle were frequently attributed to their mischievous operation; and cattle that died suddenly, without any apparent cause, were commonly said to be elf-shot. They were said to be very fond of human children, and They were said to be very fond of human children, and were in the habit of carrying away such as they could lay hold of, and leave vixens of their own in their room. In Poole's "Parnassus" are given the names of the fairy court:—"Oberon, the emperor; Mab, the empress; Perriwiggin, Perriwinele, Puck, Hobooblin, Tomalin, Tom Thumb. courtiers; Hop, Mop Frop, Pip, Drip, Skip, Tub, Tib, Tick, Pink, Pin, Quick, Gill, Im, Tit, Wap, Win, Nit, the maids of honour; Nymphidia, the mother of the maids." T. Crofton Croker, in his "Fairy Legends and Traditions of the South of Ireland," describes them as beings "a few inches high, airy, and almost transparent in body; so delicate land, describes them as beings "a few inches high, airy, and almost transparent in body; so delicate in their form, that a dewdrop, when they chance to dance on it, trembles, indeed, but never breaks. Both series are of extraordinary beauty, and mortal beings cannot be compared with them." They live in large cannot be compared with them. cannot be compared with them." They live in large societies, and are governed by a queen; and the peasantry never speak of them but with caution and respect, as the good people and friends, believing them to be present, and to hear what is said. They have their dwellings in clefts of rocks, caves, and ancient tumuli, and every part of them is decorated in the most splendid and gorgeous manner. The popular belief in fairies may now be said to have died out in this country; but it it was are indebted for a class of this country; but to it we are indebted for a class of literature which, at least to the young, has its cease-less charms. The true fairy tales first became popular in the latter part of the 17th century, and the Italians appear to have been the first to take the lead. After a time, they became very popular in France; and, at present, they are more extensive and popular in Germany than in any other country.

FAIRY RING OF CIRCLE, is a ring occasionally observed in pastures, and which was usually attributed by the peasantry to the daucing of the fairies. They are seldom of a perfect form, but are usually more or less irregular, sometimes forming a series of area of circles. They were ascribed by scientific men to various causes; but they are now known to be occasioned by the growth of certain kinds of fungi, which, proceeding outwards from a centre, render the soil for a time unfitted for the nourishment of grass.

FAITH, faith (Lat. fides), is that assent or credence

Fall of Bodies

which we give to the declaration or promise of another, on the authority of the person who makes it. The greater part of our knowledge is derived from the information of others, and depends upon the credence which we give to their testimony; hence, to believe and to know are sometimes used indiscriminately. Bath is the person by which we obtain a knowledge of Faith is the means by which we obtain a knowledge of things which do not come under our own observation, things not seen; and in this way faith is distinguished from sight. Faith is also distinct from reason, in so far as it deals with matters which we cannot comprehend by our reason; but, at the same time, while we exercise faith, we must also exercise reason; for it is impossible to exercise an acceptable faith without reason for so exercising it. Henry Rogers represents "reason and faith as twin-born; the one, in form and features, the image of manly beauty, the other of feminine grace and gentleness, but to each of whom, alas! is allotted a sad privation. While the bright eyes of Rosers are full of represent and restless intelligence. of Reason are full of piercing and restless intelligence, his ear is closed to sound; and while Faith has an ear of exquisite delicacy, on her sightless orbs, as she lifts them towards heaven, the sunbeam plays in vain. Hand-in-hand the brother and sister, in all mutual love, pursue their way through a world on which, like ours, day breaks and night falls alternate; by day the eyes of Reason are the guide of Faith, and by night the ear of Faith is the guide of Reason." "Reason is apt ear of Faith is the guide of Reason." "Reason is apt to be eager, impetuous, impatient of that instruction which his infirmity will not permit him readily to apprehend; while Faith, gentle and docile, is ever willing to listen to the voice by which alone truth and wisdom can effectually reach her." (Essay on Reason and Faith.) Faith, in Theol, denotes the assent of the mind to the truth of what has been revealed to us to the All-Serietteen reasonability that living in the Holy Scriptures, more particularly that living reception of truth by the heart by which we see our sinfulness in the sight of God, and are led to flee to sinfulness in the sight of God, and are led to flee to Christ for salvation. Some theologians distinguish four kinds of faith:—(1) A mere assent to the truth of the doctrines of the Gospel, which leaves the heart numoved and unaffected; (2) a belief in the doctrines of Christianity, coupled with a sense of our lost and sinful condition; (3) the assent of the mind, also, to the means of man's justification in the sight of God; and (4) such a belief us, by the aid of the Holy Spirit, leads us to come to Christ, and place all our hopes in him for salvation, which alone is the "saving faith." There was also in the early church that miraculous faith by which the apostles and others were able to faith by which the apostles and others were able to work miracles.

FARIR, fa-keer' (Arab., poor), a term applied to asceites in several parts of the Eastern world, particularly in India, and is synonymous with the Fersian and Turkish dervish (which see). Some of them live in communities, like the monks of the Western world, while others live singly, as hermits, or wander about, making strange displays of self-torture and mortificamaking strange displays of self-torture and mortifications. Their appearance is flithy and disgusting in the
extreme. They go about naked, frequently with their
bodies besmeared with the dung of the holy cow. They
sometimes unite in bands, carrying banners, and
making a great noise with drums and horns. Some of
them hold their arms up in one position for years,
till they have lost the power of taking them down
again; others bend the body forward, till they are
mable to restore it to its natural position again; while
others cleuch their fists till the nails grow through the
hand. They usually take up their abode in shady
places, either in the open air or in old and ruinous
buildings, without anything to repose on or to cover
themselves. One writer affirms that a member of this
order should have ten of the qualities proper to the
dog; among which are, to be always hungry; to have
no fixed residence; to watch during the night; to leave
no fixed residence; to watch during the night; to leave
no heritage after his death; not to abandon his master,
although ill-treated by him; to content himself with athough ill-treated by him; to content himself with the lowest place, and to yield his seat to any one who wants it. It is estimated that there are not less than three millions of fakirs in India. Many of them are undoubtedly insane; but the greater part of them are

the existence of a slight festoon on the lateral margin of the upper mandible, and also of an acute tooth on each side towards the apex. The wings are very long and pointed, the second and third quills being the longest; the tail is long and rounded; the tarsi of moderate length, stout and reticulated; the toes usually clongated, and terminated by long curved and acute claws. The tongue is fleshy, sloped, and canaliculated. The falcons proper are distinguished from the gerfalcon by a tooth more strongly defined on each side of the upper mandible, which, among the others, is a mere festoon; the lower mandible is also much more sloped at its point than in the true falcon. The falcons are found in all parts of the world, and the number of species is very large. Their flight is very swift, and their courage certainly greater than that of other rapacious birds. Their flight is performed by regular continuous beats, with little or none of that saling motion which characterizes the kites. In capturing their prey, whether in the air or on the ground, they descend perpendicularly upon it. Their food consists, for the most part, of small quadrupeds and birds; but many of them also feed partly on reptiles and insects. The nests of these birds are rough and bulky, composed of sticks and twigs placed in the hollows of rocks or in trees. The eggs are usually laid at the close of winter or very early in spring; they vary in number from three to six, and are generally speckled with red or brown. (See GEE-FALCON, GORNAWES, &c.)

FALCORY. (See CHEVALOON, GORAWAR, &C.)
FALL OF BODIES, faul (Ang.-Sax.).—When a body is allowed to drop through the sir from a great height, or is thrown upwards, or through the air in any direction, the course which it takes, and the rapidity of its motion from or towards the earth, is regulated in all motion from or towards the earth, is regulated in an eases by certain laws. The motion of a body projected through the air in a horizontal or oblique direction, and the path which it describes, are considered elsewhere (see PROJECTILES, THEORY OF); and it will be sufficient here to examine the rate of motion of a body moving towards or from the earth in a vertical line. If a person were to stand on the top of a very high to the earth, moving much more rapidly as it approached the ground than it did when it was first dropped from the hand at the top of the tower. Its motion downwards is found to be what is termed a uniformly accelerated when it was first dropped from the hand at the top of the tower. Its motion downwards is found to be what is termed a uniformly accelerated writing the state of th formly accelerated motion; that is to say, a motion continually increasing at a certain rate; or, in other words, if a body be moving at a certain velocity at the expiration of one second from the point of time at which it was allowed to fall, it will be moving twice as fast at the expiration of two seconds, three times as fast at the end of three, and so on. Experiments have shown that the rate per second at which bodies acquire velocity if moving downwards through the air, or lose velocity if moving upwards, is 321 feet. (See GRAVITA-TION, PENDULUM.) This velocity acquired by a falling body in a second of time is called the measure of the body in a second of time is called the measure of the accelerating force, which force is produced by the attraction of the earth. Therefore, when a ball has been allowed to fall from the top of a tower, it is moving at the rate of 32½ feet per second at the end of the first second after it has been dropped from the hand; at the end of the next second, it is moving with a velocity of 64½ feet per second; and so on. It will be seen, therefore, that the velocity of a body at any period of its fall may be ascertained by multiplying the rate of motion at the end of the first second, or, as it is generally called, the measure of the accelerating force, by rally called, the measure of the accelerating force, by the number of seconds during which it has been falling. The velocity of a body at any period of its fall being known, the space or length through which it has fallen may be ascertained by multiplying the velocity at that period by the number of seconds during which it has een falling, and dividing the result by 2. Thus, if a been taking, and dividing the result by 2. Lus, it is body has been falling from a state of rest for 5 seconds, its velocity at the end of the fifth second will be  $32\frac{1}{8} \times 5$  =  $160\frac{1}{9}$  feet per second; and the space through which it has fallen will be  $100\frac{1}{8} \times 5 + 2 = 402\frac{1}{19}$  feet. If a body be thrown from the hand with considerable force, in impostors and hypocrites.

EALCON. (See FALCONIDE.)

FALCONIDE., fül-kon'i-de.—Birds of this genus are its velocity at any period of its course will be found by distinguished from all other members of the family by adding the rate of motion that it would have attained

at the end of any number of seconds, if allowed to fall from a state of rest to the initial velocity imparted to the body at the moment when it was faunched from the hand. Thus, in the example above given, if the body had been thrown downwards with an initial velocity of had been thrown downwards with an initial velocity of 50 feet per second, its rate of motion at the end of the fifth second would be 50+180% =210% feet; but the space through which it has fallen would be 50×5+402% =652% feet, as the initial velocity of 50 feet per second tends to carry it through 250 feet in the five seconds in addition to the space through which it is conveyed by the accelerating force of the earth's attraction. In the same way, if a bail be thrown upwards into the air at a certain velocity, by a person standing on the earth's surface, its motion will become slower and slower, at the rate of 321 feet per second, until the force with which it has been propelled upwards is entirely counteracted and destroyed by the attraction of the earth, which now acts as a retarding force; and when its initial velocity has been thus exhausted, the ball will seem to be stationary for a very small fraction of time, and then descend, acquiring rapidity of motion at the same rate as a ball allowed to fall from the same height from a state of rest.

FALLACY, fáll-lá-se (Lat. fallacia), in Log., is defined by Whately to be "any argument, or apparent argument, which professes to be decisive of the matter at issue, while, in reality, it is not." Fallacies are com-monly divided into two classes. monly divided into two classes, according as the error lies in the words of the reasoning (in dictions) or in the matter (extra dictionem). The former are otherwise describable as formal, or logical fallacies; the latter as material, or non-logical fullacies, as errors arising beyond the reasoning process. They may be otherwise distributed into three classes,—fallacies of assumption, fallacies of exposition, and fallacies of inference; the first two being fallacies extra dictionem, the last in dictione. The fallacy of assumption consists in our reasoning from premises which are either untrue in themselves, or not admitted by those whom we wish to convince; as in begging the question when we take a thing for granted which requires to be proved, and in reasoning in a circle. A fallacy of exposition consists essentially in a mis-statement or wrong exposition of the question argued. This fallacy is committed when the conclusion which we infer, although it may legitimately be deduced from premises true or admitted, is not the conclusion which we are bound to prove,—it is not to the point, or away from the question. It is called in Latin ignoratio elenchi, because it is not the "elenchus" (i. s. proof of the contradictory of your opponent's assertion), which it should be. The varieties of this form of error are very numerous. Fallacies of inference are all in dictione,—formal or logical fullacies. In this class, the conclusion which the argument is supposed or alleged to prove does not follow from the premises. Fallacies of inference arise from illicit process either of the major or minor term, non-distribution of the middle term, or the occurrence of more terms than three. Fallacies of inference are otherwise divided into purely logical fallacies, or such as appear on the face of the argument, and semi-logical fallacies, those which are not apparent until we have ascertained the meaning of the term in which it occurs. All semilogical fallacies of inference are referable to one cause,—ambiguity of terms. (See Logic.)—Ref. Encyclopadia Britannica.

FALLING SIZKNESS. (See EPILEPSY.)

FALLING STARS, fawl ing, meteoric bodies, supposed to be of a similar nature to serolites. (See Arrolite.) They appear to the observer to resemble stars sud-denly falling from their position in the heavens, and vanishing after a flight of short duration, during which ransanng ster a light of short duration, during which they seem to draw a brilliant train of light behind them. The diameter of these bodies is supposed to vary from 80 to 120 feet, and their rate of motion to be between 20 and 40 miles per second; their distance from the earth, when visible to the beholder as falling stars, is considered to range between 20 and 150 miles, beyond which limit they become invisible. They generally appear singly, but sometimes in great numbers, almost resembling a shower of fire, a flight of many thousands having been noticed by Professor Olmsted in North America on the night of the 12th of November, 1833. It is been ascertained, by a long series of observa-

tions, that this phenomenon occurs with regularity at certain seasons of the year, particularly in the latter part of the months of April and November. It is also supposed that they occur with greater brilliancy at intervals of about thirty-four years, Humboldt having observed a remarkable fall of shooting stars at Cumana, in South America, in November, 1799, thirty-four years prior to the occurrence of the brilliant flight noticed by Olmsted in 1833. If this be the case, the next ex-traordinary display of fulling stars will take place in November, 1867.

FALLOPIAN TUBES, fal-lo'-pe-an, in Anat., so called after the anatomist by whom they were first described, are slender tortuous canals, about four inches in length, proceeding from the upper angle of the uterus. inner, or attached extremity, is narrow and cordlike; but they soon begin to enlarge as they proceed outwards, and at length they bend backwards and downwards towards the ovary, about an inch beyond which they terminate in an expanded extremity, the margin of which presents a number of irregular processes, named fimbric, one of which, somewhat larger than the rest, is attached to the outer end of the corresponding overy. They serve as ducts of the overies.

FALLOW, fall-lo (Ang.-Sax.), in Agr., a term applied to a portion of ground in which no seed is sown for the space of a year. This is done in order that the soil may be exposed to the action of the atmosphere, son may be exposed to the adiable of the armsphere, the weeds destroyed by repeated ploughings and harrowings, and fertility restored, which previous crops had exhausted. A green fallow is a term applied to land which has been rendered mellow and clean from weeds, by means of some green crop, such as turnips, potatoes, &c.

Fallow DREE (Cervus Dama). - This kanimal may be distinguished from the stag by the spotted coat, the spread and palmated horns, and the smaller size. It seldom measures more than three feet high size. It sends at the shoulder. Its colour is reddish proven, apparent with white; but there is a variety which is of a nearly uniform dark brown. This latter is a native of a state of the time of the state of the time of the state of the uniform dark brown. This latter is a native of Norway, and was brought to England at the time of James I. The manners of the fallow deer resemble those of the stag; but it is less delicate in the choice of its food, and browses closer. It attains full growth at the age of three years, and is said to live twenty years. The fallow deer's native country is the south of Europe and the south-western part of Asia. The skin of this animal furnishes a valuable leather, and the horns, like those of the stag, are manufactured into knife-handles, &c. The shaving of the horns has been used in the manufacture of ammonia, popularly known as hartshorn. (See Deer.)
False Imprisonment, fawlee (Lat. fulsus).-

confinement of the person is an imprisonment, whether it be in a common prison, in a private house, or even by forcibly detaining one in the public streets. lawful or false imprisonment, then, is when such confluement takes place without sufficient authority. A person who falsely imprisons another is liable to a criminal prosecution, and also a civil action for damages.

FALSE NEWS .- The spreading of false news, to make discord between the king and nobility, or concerning any great man of the realm, is a misdemeanor, and punishable by common law with fine and imprisonment.

FALSE PRETENCES, THE OBTAINING MONEY UNDER, in Law, is provided for by 7 & 8 Geo. 1V. c. 29, which enacts, that if any person shall, by any false pretence, obtain from any other person, any chattel, money, or valuable security, with intent to cheat or defraud any person of the same, he shall be guilty of a misdemea-nor, and liable to transportation for seven years (now penal servitude), or to fine and imprisonment. Act 14 & 15 Vict. c. 100, provides that it shall be no bar to conviction, that such erime may amount in law to larceny; and that it shall be sufficient to prove that the defendant did the act with intent to defraud, without specifying any particular person.

FALSE SWEADING. (See PERJURY.)
FALSE WEIGHTS AND MEASURES. (See WRIGHTS

AND MEASURES.)

FALSETTO, fuwl-set'-to, an Italian word used in Mua.
to signify a feigued or artificial voice, produced by
diminishing the aperture of the throat. The Italians

#### Fama Clamosa

call the falsetto, voce di testa, or voice from the head, in contradistinction to voce di petto, the natural or

chest voice.

Fama Clamosa, fai'-mä kläm-o'-sā (Lat.), in the
Eccl. Law of Scotland, is a wide-spread report affecting the moral character of a clergyman or elder of the
church, and which may be taken up and investigated
by the church courts, independently of any regular
complaint by a particular accuser.

Familia Spirits, fām-l'-yār (from Lat. familia),
a name given to certain demons or evil spirits, which
were supposed to attend and be at the service of a

were supposed to attend and be at the service of a magician, or other favoured person. The belief in familiar spirits is very sacient, and by the law of Moses, such as had familiar spirits were to be put to death. Where Socrates speaks of his attendant demon, he is generally understood to refer to the inner feelings and promptings of his nature, and not to any familiar spirit. In eastern countries, the belief in familiar spirits is very general; and it was widely diffused over Europe in the middle ages. A favourite form assumed by a familiar spirit was that of a black dog. Jovius says that Cornelius Agripps was always accompanied by a devil in the form of a black dog; and Goethe makes Mephistopheles first appear to Faust in this shape. Paracelsus was believed to carry about with him a familiar spirit in the hilt of his sword.

FAMILIAES, fam-il'-yars (from Lat. familia, a family, as belonging to the family of the inquisitor), the name given to certain officers of the Inquisition, who assisted in apprehending such as were accused, and carrying them to prison. This office was esteemed so honourable that even noblemen and princes were ambitious of being admitted to it,-even the king of Spain himself assuming that title, and becoming protector of the order. Familiars were granted large indulgences and privileges, and might commit the most heinous crimes with impunity.

FAMILY, fam'-e-le (Lat. familia, Gr. oikos), is applied in a general sense to a number of individuals living together, or standing in a certain degree of relationship to each other; a household, including parents, children, and servants; or all descended from one common progenitor. Among the Romans, familia was applied to all persons in the power of a paterfumilias, applied to all persons in the power of a pater diminus,
—as his sons, daughters, grandchildren, and slaves;
but it was also used in a wider sense, including all objects of property, even inanimate, and is explained by
Gaius by the equivalent patrimonium. The family is
the corner-stone of the social edifice, and is well said
to be "God's best instrument on earth for the further ance of the great moral and religious interests of man." Hence, it has been taken as a model for forming other associations,—political, civil, or religious. Among the early Hebrews, and in eastern countries, the patriarchal form of government is only an extension of the family relationship. The Greeks regarded the family as a type of the state; and among the Romans the natural power of a father was taken as the basis of the whole social and political organization of the people.

The family life is based upon the wants and necessities of our nature, and is essentially fitted to develop and foster those habits and affections on which the happiness and welfare of mankind depend. It can only, ness and weizer of making depend. It can only, however, exist in a state of purity where monogamy prevails. In the family relationship we find clear evidence that the pretended state of nature, which has been represented as the primitive condition of man, is totally opposed to the benevolent designs of the Author of nature

FAMILY, in Bot., a synonym for Order (which see).
FAM, fin (Sax. funn), an instrument which is used
by ladies to agitate the sir, in order to create a sensation of coolness around them. It is manufactured of tion of coolness around them. It is manufactured of feathers, of paper, thin skin, or viory, joined together, and is generally carved and painted, in order to insure its embellishment. The fan is mentioned in the Grecian classics (Euripides); indeed, it was known in an era far prior, as there are paintings in the relies of Thebes to prove that the Egyptians were familiar with its use. The fan was first brought into European notoriety by Catherine de Medicis, who introduced it into France, where it was so constructed that it could be used and folded in a manner similar to the fan in use at the present day. Great sifins were spent on the

## Fandango

ornamentation of the fans first in vogue, and many were painted on by the cunning fingers of Watteau.
The Chinese have greatly excelled in the art of fanmaking, and in the species of lacquered fans their su-periority is fully admitted. The Chinese themselves use a cheaper sort, made of bamboo and paper, polished, which cost about tenpence each. In Europe, France manufactures the greatest number of fans used by the world of fashion. Of late years, the value of those manufactured exceeded £110,000 per annum. In the late Exhibition (1862), many pleasing specimens were shown to exhibit the high art to which fan-manufacture had arrived. A species of large fan is used in India for cooling the air of rooms and keeping down the temperature; for further information upon which, see article PUNKAH.

Fanatics, få-nåt'-iks (Lat. fanatici), is derived from the Latin fana, temples, and was applied to such as passed their time in temples, and, pretending to be in-spired by the Divinity, would burst into wild and antio gestures, utter pretended prophecies, cut themselves with knives, &c. Hence, the term has, in modern times, come to be applied to such as manifest a religious encome to be applied to such as manifest a religious en-thusiasm, uncontrolled by reason or experience, and proceeding from a belief that they are under divine direction, and doing what will be well-pleasing in the sight of God. Fanaticism is sometimes applied in a wider sense to any excessive prepossession of the mind by ideas of any kind. Fanaticism has prevailed under different forms in all ages of the world; and one of its most remarkable and dangerous features is the ten-dency that it has to appead over layer measure. dency that it has to spread over large masses of a people. It is not usually confined to one individual; for there are generally to be found others who are ready to take up and act upon the delusion. The very earnestness of the fanatic—and fanatics generally are in earnest—serves to carry conviction to the minds of others. Among persons of this class were Emanuel Swedenborg, Madame Guyon, Johanna Southcote, and numerous others. When confined to an adherence to certain theological dogmas, it is in a comparatively mild and harmless form; but sometimes it manifests itself in atrocities of the most cruel and heartrending description,—murders, assassinations, and the like. If ignorance be the mother of devotion, much more is it the mother of fanaticism; and the only fit cure for delusions of this sort is the spread of education, enabling people to judge rightly as to the relative importance of things, and to distinguish between the true and the false.

FANCY, fan'-se (Gr. phantasia), a corruption of phan-FARCY, fün'se (Gr. plantasia), a corruption of phantasy, was used by the ancient philosophers as coextensive with conception,—that power or faculty of the mind by which man reproduces the images of objects, apart from any impression on the organs of sense. It is now properly applied to a particular province of the imagination, though sometimes it is loosely used as synonymous with it. The office of the fancy, according to Mr. D. Stewart, "is to collect materials for the imagination." A man whose habits of association present to him for illustrating over habits of association present to him, for illustrating or habits of association present to him, for illustrating or embellishing a subject, a number of resembling or analogous ideas, we call a man of fancy; but for an effort of imagination various other powers are necessary, particularly the powers of taste and judgment."
"It is the power of fancy which supplies the poet with metaphorical language, and with all the analogies which are the foundation of his allusions; but its the nower of imaginations there are the source of imaginations. it is the power of imagination that creates the complex scenes he describes, and the fictitious characters he delineates. To fancy we apply the epithets of rich he delineates. To fancy we apply the epithets of rich or luxuriant: to imagination, those of beautiful or anblime Others, however, regard fancy as a higher aublime." Others, however, regard fancy as a higher evergy of the mental activity than imagination, and that it is "the imagination that furnishes the materials out of which it creates its phantasies, either by

modifying or exaggerating them, or by forming new combinations."—English Cyclopædia.

Fandargo, fin-ding-go (Sp.), is the name of an old popular Spanish dance, which proceeds gradually from a slow and uniform to the most lively, but neverrions slow and uniform to the most neily, out never-violent motion. It is denoted by two persons only, and represents the various gradutions of the passion of love to an extent bordering on the licentious. Ya-rious attempts have been made by the clergy to suppress this dance, but without success, though it is now shiefly confined to the theatres and parties of the

lower classes.
FARTASIA; făn-fai'-she-ă (Ital.), in Mus., a term used to denote an extempore performance, in which the musician gives full scope to his imagination; and which, although subjected to the fundamental laws of melody, modulation, and harmony, is not elaborated by any strict rules or forms of construction. This term also signifies a written composition, in which the com-poser indulges his fancy unrestrained by any conven-

tional forms or rules.

FANTOCCINI. (See PUPPETS.)
FARCE, farse (Fr. farce, Ital. farsa, Lat. farsum, staffed,—denoting a mixture of different things), is a dramatic piece of a low comic character, usually played as an after-piece. Its sole end being to excite mirth, it excludes nothing, however wild or extravagant, which may contribute to that object. It differs from comedy in this, that while the latter is based upon nature and truth, the former does not scruple to have recourse to any extravagance or absurdity that may serve its purpose. Farces are said to have been first introduced by the Society of Cleros de Bazoche, in Among the most celebrated of the Paris, about 1400. Among the most celebrated of the carly furces is that of "Maitre Pierre Pathelin," believed to be by Peter Blanchet, who flourished about 1460. Subsequently Molière greatly improved and elevated this class of dramatic literature. Farces usually partake of the character of the people to whom they belong; and hence the French, German, Italian, and Spanish farces have different characteristics.

FARINA (See FLOUR.)

FARMA. (See FLOOK).

FARMA, farm (Sax. farma, fearm), a portion of land cultivated for the purpose of profit. There are various kinds of farms. Arable farms are those in which the principal part of the land is under the plough; grazing farms are those in which the object desired is the fattening of cattle or other live-stock; dairy farms are those on which the chief intention is the production of milk, butter, cheese, &c.; lastly, those farms in which the arable and grass systems can be combined are called convertible farms. In some districts there are other subdivisions; such as hay or grass farms, and breeding or cattle farms. In all farms, the principal object at-tended to is the nature of the soil and its cultivation. (See ARABLE LAND, MANURE.) The farmery is usually situated near the homestead, or farmer's house; and the area or court in which the cattle are foddered, dung prepared, and other farming operations per-formed, is called the farmyard.

FARM ANIMALS .- These animals may be divided into two classes,-first, those which are used for draught or for cultivating the soil; and, secondly, those which are bred and reared upon a farm, either for dairy purposes or for the object of being soid at a profit. For draught and ploughing purposes, the horse is more employed in England than in any other country;—oven are much used among other nations. The best English plough horses come from Suffolk. The quicker action of the horse makes its work more productive than that of other animals. Amongst the farm animals which are bred for the purpose of sale, the most numerous are the sheep. The sheep is the easiest to feed of all animals, and derives the greatest benefit from what it main, and terves the greatest benefit from what it consumes; while it gives the most active and rich manure to the land. For this reason, the English farmer makes it his object to keep a large number of sheep. England has always possessed a great many sheep; the British isles were celebrated for this even in the time of the Romans. There are, at the present day, three principal breeds in England,—the Leicester, the Bouthdown, and the Cheviot. (See Sheep.) With regard to cattle, the principal objects of the English regard to catue, the principal objects of the English farmer in their rearing are the milk and meat. The milch-cow race, par excellence, of the British empire, came originally from the Channel Islands. The breed usually goes under the name of Alderney. The Ayrabirs can which first terms into retire short internal and the statement of the companies of the compan asiany goes under the battle of Attention, the Ayre say, as the Alderney cow's rival. Ireland possesses two races of milch cows. The first breed of cattle improved.

stand first: they first gained a reputation about 1775" Since that time, the race of improved short-horns has improved through the United Kingdom, and was some time ago introduced into France. The Hereford and time ago introduced into France. The Hereford and Devon breeds are reckoned next to the Durham in ex-cellence. The other farm animals of importance are cellence.

cellence. The other farm animals of importance are pigs and poultry. (See Pies, Poultry.)

Farmers-General, farm'-ers-jen'-s-ral (Fr. formiers généraux), was name given in France to the members of a privileged association, who, before the revolution of 1789, farmed certain branches of the public revenue, that is, paid the government a certain fixed annual sum for the right of collecting certain of the taxes. Under Francis I., in 1549, the duties on sult were first raised by furning the monopoly of its sale in each town. raised by farming the monopoly of its sale in each town. In 1599, Sully introduced the system of disposing of the right of farming the taxes to the highest bidder, and in this way greatly increased the public revenue. In 1728, under the regency, several of the individual leases. were united into a ferme genérale, which was let to a company, the members of which were termed fermiers généraux. In 1789, the number of fermiers general was denerates. In 1789, the number of termers general was forty-four, who paid annually into the treasury 180 millions of livres. They were possessed of extensive powers and privileges, conferred upon them by special decrees; and, from the manner in which they exercised their powers, they were riewed with great detestation by the people. Hence, during the Revolution, to which this in no small degree contributed, many of these odious taxgatherers perished on the scaffold, and an end was put to the system.

FARMING, furm'ing, the business or management of a farm, comprehending the whole circumstances and conduct of it. Farming was for a long period looked upon as a profession easily understood and successfully upon as a protession easily understood and successfully pursued only by an empiric. It is now, however, regarded in a different light, and of late years science has done great service to farming. The farmer, in order to follow his profession properly, not only requires perseverance and observation, but he should also have a sound knowledge of natural science. In England, the farmers may be arranged in the following classes:—

Large responsators and country gentlemen. 2. 1. Large proprietors and country gentlemen; 2. yeomen and farmers properly so called: 3. possessors of small farms; 4. cottagers, including different descriptions of persons who cultivate small farms and a few

acres adjoining to towns and villages.

FARO, fu'-ro, a game of cards, which used formerly to be much in vogue in England: at present, it is seldom if ever played. In the principles of the game, seldom if ever played. In the principles of the game, it is somewhat similar to range et noir. A croupler or banker, and a fulleur or dealer, sit opposite each other at an oval table, made expressly for the purpose, and covered with green cloth. Any number of persons may play, and, as a rule, the odds on the game are in favour of the croupler, who generally wins. The players have to bet on their cards winning against three dutters are the control of the croupler. those dealt for the bank, and can double their stakes every time they win. They are not allowed to increase their stakes, however, to more than sixteen times what they were originally.

FARRIERT, fire-er-e (Fr. ferrier, a horse-shoer, from Lat. ferrum, iron), in its most common acceptation, is the art of shoeing horses; but the term is also applied to the art of preventing, curing, or alleviating the disorders to which horses and cattle are subject. Before the commencement of the present century, the practice of farriery was entirely confined to a class of men who were mere horse-shoers, and who were not only utterly ignorant of the physiology and anatomy of the horse, but were also totally unacquainted with the principles of the art of healing. Since that time a veterinary college has been established, and a better class of persons have taken up the profession.

FARHINGALE, or FARDINGALE, far thing-guile, a petticoat expanded by houps of whalebone, &c. They were first introduced into England during the reign of Blizabeth; and after coming into and going out of fashion several times, they respected about 1856, in a more capacious form than ever, under the name of

crinolines (which see).

races of milch cows. The first breed of cattle improved in the midland districts was the long-horned. It is antiquity to a symbol of authority, introduced by the now pretty generally abandoned. Among the improved kings. The faces consisted of a bundle of rode breeds of long standing, the short-horns of Durham (usually birob) bound together, with an axe in the

#### Trancia

centre, the head of which projected so as to be visible to all. A class of officers somewhat similar to our old brefacters bore the fasses before the kings, and they were called lictors. The king was usually preceded by twelve lictors whenever he went abroad, and after the days of the kings, the consuls were allowed a similar number. The dictator was preceded by twenty-four lictors, to signify his unrestricted supremacy. Afterwards the lictors, with their fasces, were allowed, in diminished proportion, to each of the chief magistrates in the city, and even in the provinces.

FASCINES, file-seens' (Lat. fasces, bundles of rods with an axe bound up in the middle of them, carried by the lictors before the Roman consul or dictator), the name given in Mil. to long faggots, or bundles of A class of officers somewhat similar to our old

the name given in Mil. to long faggots, or bundles of the name given in Mil. to long laggoes or binders of brushwood, used for various purposes; such as forming the revetments of parapets in field-works, and making the roof of a blindage or magazine, which may be rendered bomb-proof by covering the fascines with a sufficient depth of earth. They are also used for making the proof of the proof o sufficient depth of earth. They are also used for making roads over wet, boggy ground. The fascine is made of twigs and sticks laid together longitudinally, and tightly bound with twisted willow or bazel rods at in-tervals of fifteen or eighteen inches. They are usually made eighteen or twenty feet in length, and shout nine inches in diameter. When they are used for the rewetment of a parapet wall, they are secured by driving long stakes through them into the bank of earth against which they are placed. Fascines are also used in civil engineering for making dams, protecting the sides of dykes, and in forming foundations for any superstructure, as well as hearting for banks and a bottom for newly-made roads. They are shorter and much thicker news-made roads. They are shorter and much thicker than the military fascine, seldom exceeding ten feet in length, but often being as much as four feet in diameter. They are placed side by side over the spot it is desired to cover, and then they are pinned to the soil beneath with long stakes, the tops of which are connected by means of rods interlaced between them. When this has been done, earth and stones are thrown on the top of the facines. Sometimes areas of considerable extent are covered in this manner; and when the surface on which they are to rest is under water, the facines are connected and floated over the spot, and then sunk into the desired position by stones and gravel placed on them; after which the necessary works may be constructed.

FAST, first (Ang.-Sax. fastan), denotes a partial or total abstinence from food, a due supply of which is necessary to maintain the body in a healthy and vigorous condition. The length of time during which a person may subsist without food is very various, even though we give no credence to those remarkable instances, some of which seem to be well-authenticated, that are given of life being maintained in the circumstances for a number of weeks. a number of weeks. (See HUNGER.) The term fast, a number of weeks. (See HUNGER.) The term fast, however, is more particularly applied to a religious observance,—the abstinence from food for a time, in order to "afflict the soul" and to increase a devotional feeling in the mind. Religious fasting may be said to have been practised in all ages and countries where any devotional feeling prevailed,—among the ancient Egyptians and Assyrians, as well as among the Hindoos and Mohammedans of the present day. In the law of Moses, we do not find much reference to fasting; and some are disposed to think that it was "among those some are disposed to think that it was "among those things which Moses allowed rather than originated, bore with rather than approved," as being an old and well-established practice. Of this, however, there does not seem to be sufficient evidence; and even though there were, we should not regard it as an arrival that the sufficient evidence. gument against fasting, as seems to be done by the writer in Kitto's "Biblical Cyclopædia," but that it arose from a fear that what ought to elevate and refine the inward feelings might degenerate into an empty out-ward ceremony. There is but one fast enjoined by the ward ceremony. There is but one fast enjoined by the great Hebrew lawgiver. On the tenth day of the seventh month, the great day of annual atouement, they were to "afflict their souls,"—a phrase which, doubtless, points to abstinence from food, as, indeed, is shown by the later practices among the Jews. Other general fasts were in course of time introduced, as commemorative of great national calamities. The prophet Zechariah enumerates four of these

## Fasti

being observed in his day: "the fast of the fourth month, and the fast of the fifth, and the fast of the seventh, and the fast of the tenth."—(Zech. viii. 19.) On particular and signal occasions, also, particular fasts were appointed, and private fasts were also common, especially among the later Jews. The abstinence usually lasted for twenty-seven or twenty-eight hours, becoming before any extended and additionally lasted for twenty-seven or twenty-eight hours, beginning before winset and not ending till some time after susset the following day. On these occa-sions they put on sackoloth and sprinkled ashes upon their heads, in token of their grief and repentance. Partial fasts were also occasionally observed on par-ticular occasions by action of them. ticular occasions by certain of them; as when Daniel tells us that he mourned for full three weeks, and "ate no pleasant bread, neither came flesh nor wine in my mouth, neither did I anoint myself at all till three whole weeks were fulfilled."—(Dan. x. 3.) Though fasting is not positively enjoined by Christ or his apostles, we have evidence in the New Testament that it was practised by the latter; and St. Paul, in enumerating what he had done and endured in the cause of Christ or the contract of the c enumerating what he had done and endured in the cause of Christ, says, "in watchings often, in hunger and thirst, in fastings often."—(2 Cor. xi. 27.) In the earliest times we do not find mention of any public and solemn fasts being observed except upon the anniversary of Christ's crucifixion. However, in process of time, days of fasting were gradually introduced, first by custom and afterwards by positive appointment. Towards the close of the 3rd century fasting cume to headd in when greater esteem from a noting came to be held in much greater esteem, from a notion that it served as a security against the machinations of evil spirits, who were believed to direct their efforts principally against the luxurious. Fasting came also be regarded as the most effectual means of appeasing the anger of an offended Deity; and hence it came to be looked upon as an indispensable duty, and express haws were enacted regarding it by the rulers of the Church. As it became more general, the severity of it was relaxed, and a mere abstinence from flesh and wine was judged sufficient. (See LEET.) The strict canonical fast only allows one meal in twentyfour hours. By the regulations of the Anglican church, fasting, though not defined as to its degree, is inculcated at seasons of peculiar penitence and humiliation as a valuable auxiliary to the cultivation of habits of devotion and of self-denial. The writer in Kitto's Cyclopedia already referred to draws from the words "Can the children of the bridechamber fast when the bridecroom is with them?" (Matt. iz. 14) the conclusion that it "involves an entire disapproval of fasting in the Christian church;" but we believe that the transfer of the t that most persons will be rather inclined to adopt the opinion of Dr. Hook, that the time when he, the brideopinion of Dr. Hook, that the time when he, the bride-groom, was with them would be an improper season for tokens of sorrow; and that he at the same time intimates that it would be their duty thereafter; a view which is confirmed by its being practiced by the apostles after his ascension. On the general subject of fasting he says, "All must acknowledge that this reetraint, even upon the innocent appetites of the body, is eminently beneficial in assisting the operations of the mind. It brings the animal part of our nature into greater sub-servience to the spiritual. It tends to prevent that brings the animal part of our nature into greater subservience to the spiritual. It tends to prevent that heaviness and indolence of the faculties, as well as that perturbation of the passions, which often proceed from indulgence and repletion of the body. It is thus highly useful in promoting that calmness of mind and clearness of thought which are so very favourable to meditation and devotion. The great end of the observance is to afflict the soul, and to increase a genuine contrition of heart and godly sorrow for sin." In the practice of fasting, then, the intelligent Christian will not rest in the outward act, but regard it only as a means to a good end,"—(Hook's Church Dictionary.) The distinction between the Protestant and the Homish view of facting is this, that the Roman regards the use of fasting as a means of grace, man regards the use of fasting as a means of grace, the Protestant only as a useful preparation for the

means of graces.

East, far'te, used in Roman antiquity for the purpose of signifying kalendars, in which were comprised their feasts, fast-days, and days set spart for the celebration of games and other ceremonies. There were two different kinds of fasti,—the fusti kalendares and

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the fasti magistrales,—the less and the greater. The former were merely as kind of diary, in which all the days were recorded as feasts, fast-days, &c.; the latter was more of a record of things appertaining to the gods, the emperors, and the magistrates. The fasti were also registers of different periods when the different years were denominated, of the names of the various consuls, and the principal events and circumstances which occurred during their consulate were thus recorded. This register was termed fasti onsulares, or the consular register. The dies fasti were always marked in the kalendar by the letter F. The classic poet Ovid celebrates the fasti in his Libri Fastorum.

FATALISM is a belief in fate, an unchangeable destuny, to which everything is subject, uninfluenced by reason, and pre-established either by chance or by the Creator. A fatalist is one who believes in fatalism.

TATA MORGANA, ful-ta mor-ga'-na (Ital.), a singular phenomenon of unusual refraction, seen in the Straits of Messina. It is sometimes called "the castles of the fairy Morgana." When the rising sun shines so that the incident rays of light form an angle of 45° on the Sas of Reggro, and the bright surface of the water is not disturbed, and the tide is at its height, certain phenomena have been observed by several travellers, to which the name of Fatz Morgana has been given. Minass states that when an observer is placed with his back to the sun, and his face to the sea, the mountains of Messuna, rising like a wall behind it, and forming the background to the picture, suddenly there appear in the water various objects,—countless series of columns, arches, castles, well-delineated pillars, loft towers, magnificent palaces, with balconies and windows, herds and flocks, armies of men on foot and on horseback, and many other things in their natural solours and proper actions during the whole of the short period of time while the above-mentioned causes remain. As the day advances, the magic scene vanishes sway. There is no doubt that this account of Minasi's is exaggerated, and had received considerable additions from his imagination; but, from many other accounts, it appears certain that the mirage at this place produces some very remarkable effects. Capt. Smyth, in his work upon Sicily, observes:—"I never met with a Sicilian who had actually seen snything more than the loom, or 'mirage,' consequent on a paculiar state of the atmosphere; but which, I must say, I have here observed many times to be unusually strong." Similar appearances occur, also, in the great sandy plains of Persia, of Asistic Tartary, of Lower Egypt, on the Masins of Mexico, in North America, &c. (See Misage.)

observed many times to be unusually strong." Simil's appearances occur, also, in the great sandy plains of Persia, of Asistic Tartary, of Lower Egypt, on the plains of Mexico, in North America, &c. (See Miragr.)

Fare, fait (Lat. falum), denotes, in a general sense, an inevitable necessity dependent on some superior cause. It is derived from fundum, 'speaking,' and primarily implied a word or decree spoken by a deity, the order of things divinely prescribed, according to which there is allotted to every person what shall befall him. It was also sometimes employed to denote the connection of causes in nature, or in the divine appointment, forming, as it were the links of a chain, in which all things are indissolubly united together. It as as used to express a certain unavoidable designation of things, by which all agents, both necessary and voluntary, are awayed and directed to their ends. Fate is sometimes divided into physical and divine; the former being the order and series of natural causes appropriated to their effects, the latter what is more usually called providence. According to Leibnitz, there are three kinds of fate,—" s fatum Mohometz, there are three kinds of fate,—" s fatum Mohometz, there are three kinds of fate,—" s fatum Mohometz, there are three kinds of fate, and mohomet should be avoided, as if there was an absolute mecessity. The Stoical fate will have a man to be quiet, because he must have patience whether he will or not, since 'tis impossible to resist the course of things. But 'the sure are and the foreknowledge and providence of God."

and providence of God.

FATHERS, THE, fat-therz (Sax. fxder), a name applied to the early writers of the Christian church,—those writers who have given us accounts of the trathose writers who have given us accounts of the trathose writers who have given us accounts of the trathose writers who have given us account of the trathose who have during the first six centuries of the Christian era, 1824.

and no writer is dignified with the title of father who wrote later than the 12th century. They are frequently divided into the Greek and Latin fathers; and those who flourished before the council of Nice, in 325, are called the ante-Nicene fathers. The chief fathers of the first six centuries were as follows:—In the let centhe first six centuries were as follows:—In the 1st century flourished Clement, bishop of Rome, and Ignatius, bishop of Antioch; in the 2nd century we have Polycarp, bishop of Smyrns, Justin Martyr, Hermias, Diouysius of Corinth, Hegesippus, Tatian, Athenagoras, Theophilus, bishop of Autioch, Ireneus, bishop of Lyons, Clement of Alexandria, and Tertullian; in the 3rd century, Minucius Felix, Hippolytus, Origen, Cyprian, Dionysius, bishop of Alexandria, Gregory (Thaumsturgus); in the 4th century, Arnobius, Lactantius, Eusebius, Julius Firmicus Maternus, Hilary, bishop of Poitiers, Athanasius, Basil. Enbrain the tantius, Eusebius, Julius Firmicus Maternus, Hilary, bishop of Potiters, Athanasius, Basil, Ephraim the Syriam, Cyril of Jerusalem, Gregory of Nazianzen, Gregory of Nazianzen, Gregory of Nazianzen, Gregory of Nazianzen, Gregory of Milan, Epiphanus, bishop of Salamis, Chrysostom, bishop of Constantinople, Ruffin, presbyter of Aquileia; in the 5th century, Jerome, Theodorus, bishop of Mopeustia, Augustine, Cyril of Alexandria, Vincent ef Lerins, Isidore of Pelusium, Theodoret, bishop of Cyrus in Syris, Leo I., surnamed the Great, Vigilius, bishop of Thapsus; in the 6th century, Procopius of Gaza, Aretas, Gregory, bishop of Tours, Gregory I., surnamed the Great, bishop of Rome. The last of the fathers is Bernard of Clairvaux, who died about the middle of the 12th century. Ecarned men and theologians differ very much in opinion as to the value that is to be attached to the writings of the fathers. that is to be attached to the writings of the fathers. By some they are looked upon as nearly of equal auby some they are looked upon as hearly of equal tu-thority with the Sacred Scriptures themselves, and as the most excellent guides in the paths of piety and virtue. Others regard them as unworthy of the least attention, considering them the very worst of all instructors, and treating their precepts and decisions as perfectly insipid, and in many respects pernicious. The right we believe lies between these two extremes; The right we believe lies between these two extremes; and while the Roman Catholics exalt too highly the opinions of the fathers, yet by Protestants generally they are too much disregarded. Their writings contain many sublime sentiments, judicious thoughts, and things naturally adapted to form a religious temper and to excite pious and virtuous affectious; at the same time, it must be confessed that, on the other hand, they abound still more with precepts of an excessive and unreasonable austority, with Stoical and Academical dictates, with vague and indeterminate notions, and, what is still worse, with decisions absolutely false and in manifest opposition to the character and commands of Christ. Of the character and doctrines of the priwithin a comparatively short period of the apostles, there are many things which they relate regarding apostolic times which had come down to them by tradition, and which are therefore not to be altogether dition, and which are increment and the rejected. In many cases, therefore, they are to be deemed as competent witnesses of facts; but we must not confide in their decisions as judges. They had to not confide in their decisions as judges. They had to contend with numerous adversaries, and in the heat of controversy they not only fell into various misukes, but made use of very unsatisfactory methods of reasoning, betraying imbecility of judgment or inattention to the principles and rules of logic. Their works, instead of being distinguished by correctness and strength of argument, furnish innumerable examples of feeble reasoning, of interpretations of Scripture irreconcil-able with good sense, and of a careless admission of

spurious writings as genuine authority.

FATROM, fath om (Sax, fathom), a measure of length containing six feet. It is principally employed in ascertaining the depth of water and mines, and for

regulating the length of cordage and cables.

Fars, fits (Sax. fet, fat).—In Chem., these important compounds are so nearly connected with the fixed oils, that it will be necessary to consider the properties of both under one head. The fats and fixed oils form a well-deflaed natural group of organic compounds, occurring abundantly both in the animal and vegetable kingdoms. Although, in common language, we speak of coal oils and essential oils, neither of these must be confounded, chemically, with the true fixed oils. The vegetable fats and oils are found.

Fear

in various parts of the plant, but they are most shundant in the seeds. The seeds of the Crucifore anuncant in the seeds. The seeds of the Cracifere especially yield a large quantity of eil; rapeseed, for instance, containing from 30 to 40 per cent. In animals, fat is found distributed through most parts of the body in warm-blooded animals, while in fish, and cold-blooded animals generally, its place is taken by oils. Fats and oils are extracted from animal and by oils. Fate and oils are extracted from summa and vegetable matter by simple pressure, or else by boiling. They are all lighter than water, their specific gravity varying from 0.31 to 0.94. They are all soluble in ether, benzole, and turpentine, and may be mixed with each other in any proportion. They are insoluble in the control of in water, and only to a certain extent in alcohol. They may be heated to 500° without undergoing any change; but on distilling them, they break up into various compounds, giving off acrid and offensive smells. Hence the term of fixed oils. They consist of a mixture of at least three proximate principles in different proportions, two of which, steurin and pulmitin, are solid at ordinary temperatures, and the third, olein, which is liquid. The proportions in which olein is present constitute the real difference between a fat and an oil. When hydrated alkulies are added to fats or oils, a process takes place, which is termed saponification, or the formation of soap. The theory of this process will be found under SOAP. (See also FATTY ACIDS.) The principal oils used in daily life are olice oil, the uses of which are well known; almond oil, extracted from the kernel of the common almond; colza oil, largely used for illuminating purposes, and which is obtained from the Brassica oleifera; linseed oil, sperm, whale, cod-liver oil. The solid fate are cocoanut oil, which is nearly solid at ordinary temperatures in this climate; palm oil, butter, lard, tallow, and suct. The subjoined list of animal fats and their melting The subjoined list of animal fats and their melting points has been given by the late Dr. Robert D. Thomson:—Badger fat, 86°; beef tallow, 984°; calf tallow, 136.8°; camel, 131°; cochineal fat, 104°; cow's butter, 79.7°; duck's fat, 77°; dog, 793°; fox, 129°; hare, 1174°; hog's lard, 80.5°; horse grease, 140°; human fat, 77°; pheasant, 109°; turkey, 113°; stearin (human), 120°; stearin (sheep), 109°; stearin (oxen), 111°; stearin (bog), 109°; stearin (duck), 109°; cetin, 120°; cantharides fat, 934°; palmitin, 115°.

Fatty Actos, füt'te.—In Chem., when a fat or oil is saponified by an alkali, a peculiar change takes place, the stearin, palmitin, and ofen, of which it is composed, and which are the stearute, pulmitate, and

place, the stearin, paimitin, and oten, of which it is composed, and which are the stearute, pulmitate, and oleate of glyceryl, respectively leave the glyceryl and unite with the alkali to form stearute, pulmitate, and oleate of potash or soda, as the case may be. On decomposing either of these compounds with a strong mineral acid, the alkali unites with it, setting the fatty mineral acid, the sixtail unites with t, setting the sativy soid free. This may be easily tried by dissolving some tallow or oil in a solution of potash or soda, and pre-oppitating the fatty acids by means of oil of vitriol. The fatty acids fall into two groups,—the stearic series and the oleic series. The principal members of the former are the mellisic and cerotic, found in bees-; the stearie, found in most animal fats; the sitic, found in palm oil; the laurie, found in cocoanut oil; and the butyric, found in butter. The principal members of the oleic series are the crucic, found in mustard-seed and rapeseed; the olsic, found in all non-drying oils; the physetoleic, found in sperm oil; and one or two others of common import. Oils are commercially divided into drying and non-drying oils, the former absorbing oxygen from the air and forming

the former absorbing oxygen from the air and forming a solid, the latter remaining liquid.

FATUTIVE, fat.w-o-te (Lat. fatuitas, from fatuus, foolish), denotes foolishness or weakness of mind. The fatuous are distinguished from the imbecile, or idiots, in that the mental powers which they once possessed have been impaired or extinguished, whereas, in the case of the latter, the mental powers have been deficient from birth. There are various degrees and kinds of fatuity. It may amount only to some incoherence of ideas and words, or the patient may be deprived of all consciousness; it may merely enfeeble the intelligence or memory, or it may pervert the moral nature. (See INSARIEX.)

moral nature. (See INSANIET.) furnithments, in Anat, is the gorne, or back part of the mouth, terminated by the gullet. 825

FAULTS, faults (Fr. faute, defect), in Min., a miner's term for any fissure accompanied by a displace-ment of the strata. Slip, slide, heave, pitch, and throw are also common miner's terms for the same thing.

are also common miner's terms for the same thing.

FAUN, faun, a name given, in Roman Myth., to a class of deities supposed to inhabit the groves and forests. The fauns are nearly identical with the panes of the Greek mythology. These rural deities are supposed to be the descendants of Faunus, one of the kings of Latium, who was worshipped as presiding over fields and herds; and he is thus identified with the Greek Pan and the Bgyptian deity Meudes. The ceremony of the Faunalia was one of those celebrated by the country people of Rome, and it took place on the 5th of December.

FAUNA, fuw-na, a term employed by naturalists to express the whole of the members of the suimal kingexpress the whole of the memoers of the animal sing-dom living in a particular district, or at a particular time. Thus all the animals living in Great Britain constitute the British fauna. Those inhabiting the land form the terrestrial fauna, and those inhabiting the seas, the marine fauna. It is often applied, oul-lastivaly to all the animals of the world, the extinct the seas, the marine launa. It is often applied, or-lectively, to all the animals of the world, the extinct species constituting the fossil fauna, and the living species the recent fauna. The word is derived from the Fauni, who were supposed to be the patrons of wild animals.

FAUSSE-BRAYE, fose'-brai (Fr. fausse-braye; Ital. fossa-braa), in Mil., the name given to a low rampart and parapet, which was sometimes raised in the ditch surrounding the enceinte of defensive works of the 15th, 16th, and 17th centuries, round the base of the main rampart of the fortress, and extending about 20 feet beyond it. The terre-plein, or surface of the ground within the work, was generally on a level with that of the surrounding country, and therefore below the creat of the glacis. A parapet wall was thrown up round the outer edge of the mound, which was sometimes pierced with embrasures for caunon. The fausse-braye seems to have been an addition to the main rampart that was more beneficial to the attack. main rampart that was more beneficial to the attacking party than to the defenders, as no effectual free could be directed from thence until the enemy appeared on the crest of the glacis, and it would afford considerable assistance to an attacking force in scaling the walls of a fortress, after effecting a lodgement in the distribution. It appears to have had its origin in a bank the ditch. It appears to have had its origin in a bank of earth that was frequently thrown up against the walls of ancient cities, to protect them in some measure from the assault of the battering-rams, and to have been superseded by the introduction of the

covered way.

Fawn, an appellation given to a buck or doe of the

FAWN, an appellation given to a Duck of doe or the first year. (See Darn.)
FRAIN, fe-dl'-te (Fr. feaulté; Lat. fidelitas), in Law, denoted, under the leudal system, an obligation on the part of the vassal to be faithful to his lord, and to defend him against all his enemics; and by the fendal law, an oath of fealty was required to be taken by all tenauts to their landlords, which was couched in almost the same terms as our ancient oath of allegiance, which a subject owed to his sovereign. Foreign jurists generally regard fealty and homage as convertible terms, because in some countries they are jurists generally regard fealty and homage as convertible terms, because in some countries they are blended, so as to form one engagement. In this country, however, they are distinct, homage being the acknowledgement of tenure,—the oath taken by a tenant when he comes to his land; and fealty, the oath of fidelity by a vassal to his lord. The oath of homage is taken by the tenant kneeling, that of fealty standing, and includes the following obligations:—(1) incolume, that he do no bodily harm to his lord; (2) incolume, that he do no bodily harm to his lord; (2) tutum, that he do no secret injury to him in his house : (3) honestum, that he demage not his reputation; (4) still, the he do no damage to him in his possessions; (5) fucile, and (6) possibile, that he make it easy and possible for the lord to do any good which was before in his power to do.

in his power to do.

Fran, feer (Sax. feron), in Ethics, is a painful emotion, or unessiness of mind, excited by the apprehension of impending evil, and accompanied with a desire of avoiding it. It shows itself by paleness of the cheek, sinking of the spirits, trembling of the limbs, hurry and confusion of mind, sometimes producing lainting, and even death. Sometimes it rouses

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nature to exert itself to the utmost to avoid the approaching evil, and often things almost incredible have been performed under its influence. The fear of God is such an awe and reverence for the Supreme God is such an awe and reverence for the Supreme Being as renders a man religiously careful not to offend him, but to endeavour to please him in all his actions, and to cultivate such a temper and dispo-sition of soul as are agreeable to the Divine nature. It evidences itself by a dread of his displeasure; a desire of his favour; regard for his excellences; submission to his will; gratitude for his benefits; sin-cerity in his worship; and conscientious obedience to cerity in his worship; and conscientious obedience to his commands. Fear was deified by the ancient Greeks and Romans.

FRAST, or FESTIVAL, feest (Lat. festum), in a religious sense, is a ceremony appointed to commemorate a certain event. Some derive the word from the Latin feriari, to keep holiday; others from the Greek hestiao, I feast or entertain, from hestia, a hearth or fire. Almost every religion, true or false, has had its solemn feast-days. The ancient Greeks and Romans had them, as well as the Jews and modern Christians, God appointed several festivals among the ancient Jews, the first and most ancient of which was the Sabbath, or seventh day of the week, commemorative of the creation. The Passover was instituted in memory of their deliverance out of Egypt, and of the favour of God in sparing their first-born, when those of the Egyptians were slain. The feast of Pentecost was celebrated on the 50th day after the Passover, in memory of the law being given to Moses on Mount Sinai. The feast of tents, or Tabernacles, was insti-tuted in memory of their fathers having dwelt in tents tated in memory of their fathers having dwelt in tents for forty years in the wilderness, and all Israel were obliged to attend the temple and dwell eight days under tents. These were their principal feasts; but they had numerous others; as the feast of Trumpets, the feast of Expistion or Atonement, the feast of the Dedication of the Temples, the New Moons, &c. In the Christian church, no featural appears clearly to have been instituted by Jesus Christ or his apostles, wet Christians have always eslebrated the memory of yet Christians have always celebrated the memory of his resurrection, and numerous others were introduced at an early period. At first, they were only appointed to commemorate the more prominent events in the life and commemorate the more prominent events in the life and death of our Redeemer, and the labours and virtues of the apostles and evangelists; but martyrs came soon after to be introduced, and by the 4th century their number had increased to a very extravagant extent. And not only so, but instead of being spent in devotional exercises, they were employed in the indulgence of sinful passions, and in criminal pursuits; indeed many of the festivals ware invitived on. indeed, many of the festivals were instituted on a pagan model, and perverted to similar purposes. Fessets are either movable or immovable. Immovshe feasts are such as are celebrated constantly on the same day of the year, the principal of which being Christmas-day, Circumcision, Epiphany, Candlemas or Purification, Lady-day or the Annunciation, All Saints', All Souls'; besides the days of the several apostles as St. Thomas, St. Paul. Movable feasts are such as as St. Thomas, St. Paul. Movable feasts are such as are not confined to the same day of the year. Of these, the principal is Easter, which gives law to all the rest, all of them following and keeping their proper distances from it; as Palm Sunday, Good Friday, Ash-Wednesday, Sexagesima, Asception-day, Pentecost, and Trinky Sunday. Besides these, which are general, there are others which are local or occasional, enjoined by the magistrate, or voluntarily set on foot by the people. "There is something truly admirable in the order and succession of these holy days. The Church begins her ecclesiastical year with the Sundays in Advent to remind us of the coming of Christ in the in Advent to remind us of the coming of Christ in the flesh. After these, we are brought to contemplate the mystery of the incarnation; and so, step by step, we follow the Church through all the events of our Sa-

follow the Church through all the events of our Saviour's pilgrimage to his ascension into beaven."

FERTHESS, felt-ers (Ang.-Sax.), the general name for the exterior covering of birds. They consist of the quilt, the shaft, and the vanes. The quill is a hollow semi-transparent horny cylinder, by which the feather is attached to the skin. It combines strength with lightness in a very extraordinary manner. The cavity of the quilt contains a series of copical espules united together by a central pedicle, forming the mem-

branous remains of the original formation-pulp. brancus remains of the original contacton-pulp. The shaff is quadrilateral, with a smooth convex surface: it contains a white, dry, and very light pith. The cases are subdivided into two parts,—the barbs and the barbules. The sides of the shaft are covered with the barbs, and each barb forms of itself a small shaft, which is covered in a similar manner with little barbs on each edge. Those barbules are so firmly bound to each other, that although, in reality separate, they seem to adhere. The feathers of birds are changed at periodical intervals. This is called "moulting." at periodical intervals. This is called "moulting," Festhers vary in their size, form, and function, and in most cases are accompanied by an accessory plume, which is usually in the form of a small downy tuft. In high northern latitudes, the inhabitants wear the skins of some birds with the feathers ou, as clothing. In Greenland, clothes made with the skins of eider-ducks are worn with the feathers inside. The ancient Mexicans made pictures with the coloured plumes of humming-birds, after the manner of mossic. Feathers make a considerable article of commerce. The feathers of the ostrich have been held in high estimation from the times of antiquity, and have been used tion from the times of antiquity, and have been used as ornaments for the fans and head-dresses of ladies, the helmets of warriors, and for gay processions.

Many parts of England and Scotland supply feathers for beds, and an inferior sort is imported from Ireland. The finest feathers used for this purpose are those of the eider-duck, which is obtained in Greenland, Ice-land, and Norway. Very fine feathers, especially for land, and Norway. Very fine feathers, especially for quills, are obtained from Hudson's Bay. Down, or the first covering of young birds, is also an article of commerce. The down of the swan is brought from Dantzic, together with a large quantity of superior feathers. In 1845, a duty, which had, up to that time, been levied on feathers, was ropealed. (See BINDS.)

FEBRUARY, feb-ru-a-re ((Lat. Februarius, from februo, I purify), is the name of the second month of our year, and contains ordinarily twenty-eight days, except in leap-year, when it has twenty-nine, an in-terculary day being added. It is so called because in that month funeral lustrations were performed at Rome. It was introduced into the calendar by Nums, who gave it the twelfth place; but the decemviri sub-sequently transferred it to where it now stands.

FECIALES, fe-she-ai-leer, priests among the Romans, Etruscans, and other sucient nations of Italy, who acted as heralds of peace and war. Their persons were sacred from injury when engaged on any mission to a hostile state, as the persons of ambassadors, and messengers under a flag of truce, are inviolate in the present time. Their duties in some few particulars resembled those of the heralds of the middle ages. If the people of any city or nation had committed an act of aggression against the Romans, one of the leciales was sent to state the wrong that had been perpetrated and to ask for reparation. After a few days had elapsed, the herald made a second visit to receive the answer which might be prepared to the demand made by the Roman authorities. If it was unfavourable, the herald Roman authorities. If it was unfavourable, the herald again returned to Rome and stated the results of his mission, and if war was determined on by the consuls and the senate, he proceeded a third time as far as the boundaries of the offending state, and hurled a bloody spear within them, which was considered to be equivalent to a proclamation of war, and an intimation that open hostilities had commenced. It was also the duty of these sacred heralds to complete treaties of peace with nations with which the Romans had been engaged in war, and treaties of alliance with those who were on terms of friendship with the powerful Roman people. The Roman feciales were twenty in number, and formed a kind of college of heralds, insti-tuted by Numa Pompilius, the second king of Rome, about 710 B.c.

FEDERAL GOVERNMENT, fed'-e-rul (from Lat. fedus, a league), is a government formed by the union of a seque), is a government formed by the union of several sovereign states, each state giving up a portion of its power to the central authority, and yet retaining its powers of self-government. It differs from a con-federacy in this, that each of the states that compose the latter is properly independent or supreme, the central authority having no power to enforce sny of its measures upon the individual state, that being in the hands of their own governments. The Germanie

## Federalists

confederation belongs to this class, the diet being merely an assembly of ambassadors from several confederated but independent governments, and the resolutions of the diet being merely articles of agreement which each of the confederated governments spontaneously adopts, but which owe their legal effect in each state to laws and commands fashioned upon them by its own immediate chief. The common form of a federal government is where the central authority is vested in the hands of representatives appointed by the sovereign power of each state. Their powers are determined by the contract, and vary in different cases. In some, as in the Swiss cantons, it is little more than a confederation; in others, as in the United States of America, it approaches to a union. "The federal congress of the American union," says Mr. Mill, "is a substantive part of the government of every individual state. Within the limits of its attributions it makes laws which are obeyed by every citizen individually, executes them through its own officers, and enforces them by its own found, or which is even likely to produce, an effective federal government."—(Representative Government.)
Federations of a kind existed in smalent times, as that of the Edician league, &c.

the Etolian league, &c. .

FEDERALISTS, fed-e-räl-ists, was the name of a political party in the United States formed in 1788, and who claimed to be the peculiar friends of the constitution and the federal government. Their most distinguished leaders were Washington, Adams, Hamilton, and Jay, and the leading federalist states were Massachusetts and Connectiont, supported generally, though not uniformly, by the rest of New England; while Jefferson, Madison, Munroe, Barr, and Gallatin, led the opposition. Their opponents, the republicans, they called anti-federalists, and charged them to a certain extent with hostility to, or distrust of, the United States constitution and the general government. In the contests of the French revolution the federalists leaned to the side of England, the republicans to that of France. The opposition of the federalists to the war of 1812, and above all the calling of the Hartford convention, effected their destruction as a national party, and in 1820 they were completely disbanded. During the flerce struggle between the Northern and Southern states, the Northern party, who were in favour of maintaining the Union, were designated as Federalists. The Southern states, who desired to form themselves into an independent confederation.

independent confeiteration, were termed Confederates. Fire, fee (Sax. feh or fech, Lat. feudum or feodum), in Law, is the same with feud or fief, and in its original sonse is used in opposition to allodium, the latter denoting land beld by a person in his own right, without owing any rent or service to any superior; whereas fee or feodum is applied to that which is held of some superior, on condition of rendering him service. As no subjects can be possessed of allodial property in England, all lands being held either mediately or immediately of the crown, a fee in general is the highest and most extensive interest that a man can have in a feud. Estates of inheritance are either estates in fee simple or fee tail. An estate in fee simple is the most extensive estate of inheritance hat a man can posses in land, and is descendible to his heirs. Estates in fee simple are commonly divided into three kinds:—1. Fee simple absolute; that is, free from any qualification or condition.—2. Fee simple qualified, or base, one which has a qualification sunered to it, and which determines whenever the qualification subjoined to it is at an end; as in the case of a grant to A and his heirs, tonants of the manor of Dale,—S. Fee simple conditional is a fee restrained in its form to some particular heirs, to the exclusion of others. (For an account of estates in fee sail, see Entate.)—Ref. Stephon's Commentaries.

manor of Dale.—3. Fee simple conditional is a fee restrained in its form to some particular heirs, to the exclusion of others. (For an account of estates in fee tail, see ENTAIL.)—Ref. Stephen's Commentaries.

FER, in the law of Scotland, denotes a full right of proprietorship in any property, and is distinguished from life-rent, which is merely the right to enjoy it during life. Frequently the two terms occur together, and an estate is said to be granted to a parent in life-rent and his children in fee.

# Feigned Diseases

FERLING, freal-ing (Sac. felan, to feel), is primarily employed to denote the perceptions which we have of external objects by the sense of touch; but it has also come to be applied to our inward sensations. Thus a man may have a feeling of pleasure from heat, or from contemplating a beautiful landscape. In this way we have intellectual feelings, moral feelings, sensual festings into two great classes,—the mental and the corporeal, or, in other words, into sentiments and sensations. Though, strictly speaking, all conaciousness and all feeling be only mental, yet there are certain feelings that are clearly marked out to be in proximate relation to the body, and these he terms sensual feelings or sensations, while the internal or mental feelings he terms sentiments. The sensations are divided into two classes,—those which accompany our perceptions through the five determinate senses of touch, taste, smell, hearing, and sight; and those which are comprised under the common or vital sense which are comprised under the common or vital sense which are comprised under the common or or divided into two classes,—contemplative and practical; the former being the concomitants of our cognitive powers, or powers of knowledge; the latter of our powers of conation, or of will and desire. (For a very elaborate analysis of the different feelings, see Sir William Hamilton's Metaphysical Lectures, vol. it has the concess of the powers which they attend."

ences of the powers which they attend."

FEES are certain sums of money paid to official persons as perquisites, or as recompense for their labour and trouble, and are fixed by sacient usage or by acts of parliament. The fees paid to officers connected with the administration of justice have been in most cases fixed and regulated by recent acts of parliament. Officers demanding improper fees are guilty of extortion (which see). The fees of barristers and physicians are regarded as konoraria, and cannot be

recovered by legal proceedings.

FRIGWED DISLASSS, fained (Fr. feindre, to feign), are disgases which certain persons pretend to be afflicted with, in order to avoid some duty, or in the hope of gain. The soldier, to escape the performance of duty; the mendicant, to impose on public or private beneficence; the criminal, to avoid the infliction of punishment, most frequently have recourse to these pretences. They are sometimes, however, had recourse to when no adequate motive can be assigned, and are difficult of detection in proportion to the skill with which they are simulated; and Fodère has observed that during the conscription in France the subject had been "brought to such perfection as to ronder it as difficult to detect a feigned disease as to cure a real one." The diseases most commonly feigned are epilepsy, catalepsy, convulsions, blindness, deafness, palsy, insanity, indigestion, neuralgia, rheumatism, palpitation of the heart, ulcers, &c. Vomiting, spitting of blood, diarrhea, and ophthalmia, are also often simulated. It frequently demands very considerable ingenuity on the part of the physician to detect the knavery of such persons. The physician, after ascertaining that the apparent disease is capable of being simulated, and how far it is so, should endeavour to learn what motives the patient may have for playing such a part. His intelligence should be gauged, and the accordance of the disease with his age, sex, condition, &c., carefully examined. He should also ascertain from the relatives or friends of the suspected person what are his physical and moral habits. "But the chief dependence," says M. Rostam, "must be placed upon well-directed questions, for the impostor is rarely so familiar with the symptoms of his assumed malady as not to betray himself when asked if he does not feel certain symptoms foreign to his case, or to contradict himself when questioned at different times regarding the course of his disease. His embarrasement is likely to be much increased when he is cate-ohised respecting

## Felo de Se

light is thrown upon these cases by an examination of the involuntary functions. In diseases in which the pulse ought to be affected (and there are few which do not affect it), its condition will often lead at once to a detection of the imposture." There is generally, also, an aversion in persons feigning disease to take the proper remedies.

FRINT. (See FRICING.)
FELIDE, or FELINA, fe'-le-de (Lat. felie, a cat), a fam. of the Cat kind, of the order Carsioora, in which the destructive organs reach the highest perfection. This fam. is by some naturalists said to include the dogs, hyenas, wolves, and smaller carnivors; but the system generally adopted is to include among the Felina only the cats, itons, tigers, leopards, and lynxes. In these animals the head is short and almost rounded in its form. The principal instruments of the destructive energy of these animals are the teeth and claws. Their dental formula is as follows :-

Incisors  $\frac{6}{6}$ ; canines  $\frac{1-1}{1-1}$ ;  $\frac{\text{pris-}}{\text{molars}} \frac{4-4}{2-2}$ ;  $\frac{2-2}{1-1}$ The canines are long, sharp, compressed, and cutting; the pramolars are furnished with two roots, compressed, pointed, and serrated; the flesh-teeth, or true molars, are very large, sharp-edged, and terminated by two or three points; and behind the flesh-tooth in the upper jaw there is a small tubercular tooth, which is wanting in the lower. In addition to this formidable apparatus of cutting-teeth, the tongue in these animals apparatus of cutting-teeth, the tongue in these animals is covered with small recurred prickles, by which they can detach from the bones of their prey every particle of flesh. The palate is soft, and that part of the tongue which corresponds with it is smooth; as it advances forward, it is covered with large soft papille directed backwards; then there are four large fessulate papille, anterior to which the simple conical papille continue increasing in size to near the tip of the tougue. These papille are armed with the strong cuticular spines before mentioned. The five toes of the anterior and four toes of the posterior extremities of the cats are armed with very posterior extremities of the cats are armed with very strong, hooked, sub-compressed, sharp claws, which are preserved from being blunted by a peculiar ar-rangement of the phalanges. For this purpose the claw-joint of each toe is drawn back by ligaments attached to the penultimate joint, until it assumes a attached to the penulumate joint, until it assumes a perpendicular position, when the claw which it supports is completely retracted within a sort of sheath, and is entirely concealed by the fur. When, however, the animal springs upon its prey, the tendous of the flexor muscles of the toes implanted into the opposite surface of the phalanx overcoming the elasticity of the retractile ligaments, push forward the claws, and they are ready to be buried in the flesh of a victim. The lower surface of the foot is furnished with thick ball-like pads of the epidermis, upon which the animal walks; and these are the cause of the peculiarly noiseless tread which is characteristic of all the members of this family. It will be seen; on reference to any members of the cat tribe, that the mode of walking adopted by these creatures is different from that of man, monkeys, or bats. The weight of the body rests only on the toes, and not on the entire foot. The manner of walking is termed "digitigrade," from the Latin words digitus, a termed digitigrate, from the Latin words Legitus, a finger, and gradus, a step. Cats hunt in the gloom, and consequently, while escaping observation, require every ray of light that can be made available. The pupil is a long vertical fissure; but this only obtains among the a long vertical issure; but this only obtains among the smaller genera; for in all the Felina that surpass the occlot in size, the pupil again assumes a round form. "On the top of the skull there runs a tolerably high bony creat, which reaches its greatest elevation at the very back of the head. This bone-ridge is intended for the threatenest of the roughly mander middle which which the statement of the roughly mander mander. the attachment of the powerful muscles which raise the head and enable the animal to perform its prodigious feats of strength. Pausing awhile, and directing our attention to the anterior of the skull, a curious internal ridge of bone is seen, which rises to some little height and separates the two great divisions of the brain from and separates use two great unvisions of the origin from each other. In the cat tribe, this ridge arises entirely from that part of the skull which is known by the name of the 'parietal bone;' but in other carnivorous animals the 'occipital bone' is the principal source of this structure. The use of the bony ridge is not quite

certain; but it seems likely that it may play an impor-tant part in guarding the brain from the severe shocks which must be occasioned by the movements of the animals when they lesp upon their prey. Reverting to the exterior form, and passing from the head to the neck, we find that the first two vertebræ partake of a similar enlargement to that which has already been observed on the back of the skull. The vertebra which is nearest to the head, and is called the 'alias,' is broad and strong and appends laterally, whilst which is nearest to the near, and is called the atins, is broad and strong, and spreads laterally; while the second, or 'axis,' is long, and is developed upwards into a very powerful crest. The ribs are beautifully formed, and placed rather widely apart, giving plenty of room for the heart and lungs to perform their duties effectually. The vertebræ that fill the space between effectually. The vertebræ that fill the space between the ribs and the hip-bones are very large, and so exquisitely jointed together that they unite a graceful flexisitely jointed together that they unless grave in measure bility of movement with great musualar power."—(Reo. J. G. Woods.) With regard to the digestive organs of the Felida, the salivary glands are small, as might be expected where it can hardly be said that mastication is exercised. In the case of the lion, the stomach is divided, by a slight contraction in its middle, into two portions. As in most of the family, its muscular coats are very strong. Blumenbach observes, that in most are very strong. Blumenbach observes, that in most carnivorous quadrupeds, particularly those of a rapacious nature, the stomach bears a considerable resemblance, on the whole, to that of the human subject. "In the carnivora, the stomach, which is of a cylindrical form, has no culs de sac; the cesophagus opens at its anterior extremity, and the intestine commences from the posterior; so that everything favours a quick passage of the food, which receives no mastication, and is retained a very short time in the stomach. The intestine has no witches in small in diameter, but thus intestine has no valves, is small in diameter, but muscular, and the whole canal, when compared with the body, is extremely short, being as 3 or 5 to 1. It is worth noticing, that in the domestic cat they are as 5 to 1; but in the wild cat they are only as 3 to 1."—(English Cyclopadia.) The Felidar are distributed in all parts of the world, with the exception of Australia, but principally in the warmer regions, where alone the larger species are met with.

FELLARS, fel'-luks (Arab., poor), is the name of a people in modern Egypt who live in villages and culti-They are the most ancient race in that vate the soil. country, and are generally believed to be descendants of the old Egyptians, their physiognomy resembling that which is found on the ancient sculptures. They are a patient and laborious population, but are heavily taxed, and subjected to great hardships. They form the great bulk of the population of that country. Fallowentr, fel'-lo-ship (Sax, felaw, fellow), in a college, is an endowment entitling the holder to a share in the narrange and constitution this paragraph.

its revenues, and constituting him a part of the corporation. Fellowships are either original, having been constituted by the founder of the college, or endowed by subsequent benefactors. Formerly, most of the fellowships were restricted to the inhabitants of certain dioceses, or districts, or persons; but most of these restrictions have been removed by the commissioners, under the University Act of 1854. Some fellowships under the University Act of 1854. Some fellowships may be held by laymen, but, in general, they can only be held by persons in holy orders, or who are ordained within a specified time. They differ greatly in value, many of them being under £100 per annum, while some of them reach £700 or £800. Being paid out of the college revenues, which are for the most part received in corn-rents, they vary from year to year with the price of that commodity. The senior fellowships are the most lucrative, but all confer upon their holders the privilege of occupying apartments in the bolders the privilege of occupying apartments in the college, and certain privileges as to commons or meals. Fellowships are, in general, tenable for life, unless the holder marries, or inherite estates which afford a larger revenue, or accepts one of the livings belonging to the

FELO DE SE, fe'-lo-de-se (Lat., a felon of himself), is one that deliberately puts an end to his own existence, or who commits any unlawful malicious act, the consequence of which is his own death. He must, however, be of the age of discretion, and of sound mind, otherwise it is no crime. The law of England wisely and religiously considers that no man his a right to take away his own life, and that the suicide is

## Felony

guilty of a double offence,—one spiritual, in evading the prerogative of the Almighty; the other temporal, against the king, who has an interest in the preservation of all his subjects. The law has, therefore, ranked this among the highest orimes, making it a peculiar species of felony, a felony against oneself. If one persuades another to kill himself, and he does so, the adviser is guilty of murder; and if two agree to commit saicide together, and one only is killed, the survivier will be willed of murder according to the to commit saicide together, and one only is killed, the survivor will be guilty of murder, according to law. Formerly, the body of the felon was ignominiously buried in the highway, with a stake driven through the body; but now, by 4 Geo. IV. c. 52, it is privately interred at night in a churchyard, and without the rites of Christian burial. All the chattels, real and personal, of a felo de se are forfeited to the crown, though they are usually restored upon payment of moderate fees. The enactments against this crime, which punish only the innocent relatives, have led juries in general to find that the act was committed in a fit of temporary insanity.

aft of temporary insanity.

FRIONY, fel'-on-c (Ang.-Nor.), in Law, in its general acceptation, comprises every species of crime which occasioned, at common law, the forfeiture of lands or goods. This most frequently happens in those crimes for which a capital punishment either is, or was, liable to be inflicted. Hence all offences now capital are in some degree or other felony, as well as many other offences which are not punished with death; as suicide, homicide, larceny, &c., all of which are, strictly speaking felonies, as they subject the committers of them to forfeitures. Various derivations of the word have been Ing leionies, as they surpress the commerces a con-forfeitures. Various derivations of the word have been suggested; but the most probable is that given by Sir Henry Spelman, from the Teutonic or German fee, flef or feud, and lion, price or value; felony being thus the pretium feudi, the consideration for which a man gives up his fiel (See Forentures.) Felspar, fel'-spar, in Min., an important mineral, and common constituent of rocks. It is the represen-tation of a family and consists easentially of a double

tative of a family, and consists essentially of a double silicate of a laminy, and comes alkali, or alkaline earth. It forms a principal constituent of granite. Potash felspar is the orthose of the mineralogist, and gives rise to kaolin, or china-clay, by disintegration. Soda felspar is albite, lithia felspar petalite, and lime felspar labradorite. The term is derived from the felspar labradorite. The ter German, and means field-spar.

FEIR, felt (Sax. felt), the name given to the ma-terial formed by uniting and compressing fibres of wool, fur, and other substances fit for the purpose, into a compact body, by what is termed the felting process. This consists in mixing the fibres of the materials employed until they become interlaced or matted together in the form of a soft loose cloth or sheet, which is done by the instrumentality of carding and dolling engines. When this stage in the process has been reached, the cloth is wound on a roller, and has been reached, the cloth is wound on a roller, and carried to the felting-machine, in which the fibres are combined and interlaced still more closely by the action of heat and pressure, until the loose substance is converted into a close, thick material, possessed of great strength and durability. Felt of a fine kind is used for making hats (see Hat MANUFACTURE); and a coarser description is used for table-cloths and carpets. A stiff rough felt is also manufactured for making roofing for already and coarrings for hayring. making rooting for sheds, and coverings for hayricks and cornstacks, as well as for supplying a lining to the copper sheathing applied to the bottom of vessels; and another sort for covering steam-boilers, for which it is well adapted, on account of its properties as a non-conductor of heat. The last-named material is made conductor of heat. The isst-named material is made of the waste woollen cloths used in paper-mills, reduced to a pulp, and beaten together after being put on the boiler in a wet state. It is then allowed to dry, when it becomes stiff, solid, and utterly impervious to heat. All the other different kinds of felt are made

# Femgerichte

ment through crevices in the flooring; they are also tolerably durable, but, on account of the pattern being on the surface of the fabric, the colours are printed on the surface of the fabric, the colours are apt to fade and become obliterated by constant wear. The roofing felt is rendered waterproof by being sosked with a preparation of tar or bitumen: it is sold at a penny per square foot, and forms an excellent substitute for thatch, slates, or tiles for the roots of out-buildings, being impenetrable to rain. It would, however, burn freely, if it happened to catch on fire when in a dry state. Felt of a similar kind is also used for lining wooden buildings and the walls of rooms that are affected by damp. The Americans prepare a thin kind of felted cloth for lining coats and dresses, and felt cloth is used in this country for lining dresses, and felt cloth is used in this country for lining coaches, and for pianofortes, and a variety of other purposes. The process is said to have been invented by the Saracens for making coverings for their tents, and introduced into Europe at the time of the crusades.

FRIUCCA, fe-luk'-ka (Ital.), the largest and fastest description of boat used on the Mediterranean, having a low but graceful and buoyant hull, with a high stem and raking stern, fitted with three masts, lateen sails, a jib set on a small bowsprit, and long powerful oars to assist their progress in those lengthened calms so frequent on the above sea.

Frmale Flower, fe'-mail flow'-er (Lat. femella, Fr. femelle, female; fleur, flower), a term used in Bot. to distinguish those flowers which are furnished with pistils, or female organs, but which have no stamens, or male organs of production.

FEME COVERTE, fam ko'-vert (Fr.), in Law, denotes FIME COVERTE, fam ko'-vert (fr.), in Law, denotes that relationship in which, in consequence of marriage, a wife stands to her husband, being under his protection and influence, and her legal existence being suspended, or at least incorporated and consolidated in that of her husband. Her condition during marriage is thus called her coverture. A married woman cannot are in the civil courts without her husband's consequence and in his name as well as her own neither currence, and in his name as well as her own; neither can she be sued without her husband being made a defendant. The property of a wile is, by marriage, transferred to her husband; and all deeds and acts done by her during her coverture are yold. The done by her during her coverture are void. done by her during her coverture are void. The lauded property of a married woman is, during the marriage, under the administration of her husband, and her personal property is absolutely vested in him. When a wife is deserted by her husband, she may now obtain an order to protect any property that she may acquire by her own industry. The husband is bound to pay his wife's debts contracted previous to marriage, and also to provide her with necessaries during marriage; but he is not chargeable for anything besides necessaries. In some felonies, and other inferior crimes, committed by her through constraint of her husband, the law excuses her, except in the case of treason or murder.

FEMGERICHTE, FEHMGERICHTE, OF VEHMGERICHTE, faim-ger-ik'-ta (from the old (terman fem, punish ment, and gericht, court of justice), was the name of certain secret tribunals which existed in Westphalia, certain secret tribunals which existed in Westphalia, and possessed immense power and influence in the 14th and 15th centuries. These are said by some to have been originated by Charlemagne, but it is more probable that they were relies of the aucient German courts of justice, which continued to exist in Westphalia after they had ceased in other parts of Germany. The Fengerichte first came into notice after the deposition and outlawry of the emperor Henry the Lion, when all law and justice seemed to be set at the deposition and changed in the property including when all law and justice seemed to be set at deflance, and anarchy everywhere prevailed. In such circumstances the secret tribunals took upon themselves the protection of the innocent and defenceless, on the power in a wet state. It is then allowed to dry, when it becomes stiff, solid, and utterly impervious to lear. All the other different kinds of felt are made by smalganiating the materials by the agency of heat, moisture, and pressure. Table-cloths of this material are either embossed, having a raised pattern in one colour on a ground of another hue, or printed in a colour. In addition to being inexpensive, they have the merit of being inexpensive they have the merit of the merit of all Germany, and inspired with saltary terror those whom nothing allow would keep in check. These tribunals soon active would keep in check. These tribunals soon active

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Though originally established amounted to 100,000. for the support of right and justice, there can be little doubt that they afterwards were frequently made use of doubt that they atterwards were frequently made use of to sarry out party feelings. Any one who had a complaint against his neighbour, which could not be sustained before the ordinary judges, betook himself to the Femgerichte. From the secrecy in which they were involved, little is known regarding their internal organization. The members were called the Wissende, or the knowing ones; and, before being admitted, they must be of blameless life, of the Christian religion, and take a terrible outh "to support the holy Eam and to conceal terrible oath "to support the holy Fem, and to conceal it from wife and child, from father and mother, from sister and brother, from free and wind, from all that the sun shines upon or the rain wets, from all that is between heaven and earth." From smong the Wis-sendes the Freischöffen (free justices) were elected, who were the assessors of the court and executors of its The president of the court was called the sentences. sentences. The president of the court was careful the freignaf (free count). The general superintendence of the whole of the tribunals was in the hands of the lord of the land, who, in Westphalia, was the archield prof Cologne. The chief superintendence, however, was in the hands of the emperor, who was usually, on his coronation at Air-la-Chapelle, admitted a member of the society. The court of a Freigraf was called a Freiding, and the place where it was held a Freiding, the members had certain signs and watchwords, by which they were able to recognize each other, and which were concealed from the uninitiated. Their courts were either open or secret; the former were held by day in the open air, the latter by night in a forest, or in concealed and subterranean places. The process of trial, and the circumstances of judgment, were different in the two cases; the former decided in all civil causes, the latter took cognizance of such as had been unable to defend themselves sufficiently before the open courts, as well as such as were accused of heresy, sorery, rape, theft, robbery, or murder. The accusation was made by one of the Freischöffen, without further proof, declared upon cath that the accused had been guilty of the crime. The accused was then thrice summoned to appear before the secret tribunal, and the citation was secretly affixed to the door of his dwelling, or some neighbouring place, the name of the accuser being concealed. The citation mentioned that the accused was to meet the Wissende at a certain hour and place, and to be conducted by them before the tribunal. Here by an oath the accused might clear himself; but the accuser might also oppose it with his oath and the oaths of witnesses. If the it with his oath and the oaths of witnesses. If the acoused could now bring forward six witnesses in his farour, the accuser might strengthen his oath with fourteen witnesses; and sentence of acquittal did not necessarily follow until the accused had supported his case with the oaths of twenty-one witnesses. The judges were all armed, and dressed in black gowns, with a cowl that covered their faces like a mask. The condemned, as well as those who did not obey the summons, were then given over to the Freischöffen. The first Freischöffe who met him was bound to hang him first Freischöffle who met him was bound to hang him on a tree; and, if he made any resistance, it was lawful to put him to death in any other way; and a knife was left by the corpse, to indicate that it was a punishment indicated by one of the Freischöffen. The punishment, however, was rarely indicated on those who readily appeared, the judges being satisfied with cautioning the defender to redress the wrong he had been guilty of the leadth or grad nutter was raised against these of. At length a great outery was raised against these courts, and in 1461 various princes and cities of Germany, as well as the Swiss Confederates, united in a league to enable all persons to obtain justice by

minations proper to express females in any given

FEMORAL, fem'-o-rdl (Lat. femur, the thigh), in Annata, is applied to parts of or connected with the abigh; as, the femoral bone, or os femoris; the femoral artery, &c. (See TRIGH.)

rough; as, the temoral one, or or perform; the temoral artery, &c. (See Thion.)

Fan, fen (Sax. fen or fenn), is used to signify low land which is wholly or partially covered with water to some depth. The subsoil is always saturated, and the land itself is apt to be overflowed with the discharges of rivers and lakes. The soil of these lands is generally of a deep black colour, and is unusually rich and light to the depth of some three or four feet. As the water often filters down to the subsoil, fen lands produce crops of grass and corn in far greater abundance than lands better situated. Until of late, windmills were used to drain the English fens, as is the case in Holland; but now steam is nearly the sole agent employed for this purpose. The feus in Lincolnshire, Keut, and Cambridgeshire, are the principal instances

Acut, and Cambridgeshire, are the principal matances of this species of land in England.

Fence, fens (from Nor. defender, to prohibit, defended, a term used in Gardening and Husbandry to signify a hedge, wall, ditch, bank, or other inclosure, made around gardens, fields, woods, and other agrarian property, for the purpose of protection or separation. Fences are usually made of paining or split planks, although there are other and various methods in which have an econstructed. In the wild and wountsinous they are constructed. In the wild and mountainous regions of Ireland and Scotland, where wood is very scarce, it is usual to make fences of rough stone walls, put together without any mortar, in order to separate the property of different individuals. In parts of Galthe property of different individuals. It parts of Gat-way, in Ireland, some of these fences, or stone walls, are built in a very efficient and workmanlike mauner, and are very durable, as the stone in many instances is of a soft nature, which is liable to split with a flat surface; in such cases there are many dry walls which present in such cases there are many dry wans which present the usual appearance of those constructed with mortar. A high bank of earth, faced with turf sods, is often sub-stituted for a stone wall when stones cannot be had, and a hedge is then planted on the top of this embankment; thus completing a formidable leap to lovers of ment; thus completing a formidable leap to lovers of the chase in hunting counties. Of all fences, the best which can be constructed is, undoubtedly, a live hedge, when it is properly planted and carefully cut and trimmed when arrived atfull growth; for further infor-mation on which subject, see separate article HEDGE, A sunk fence is one which is planted in a broad, deep ditch, and is not above the level of the ground; so that it is concealed from the risw. A light fource of solit it is concealed from the view. A light fence of split rails or iron, which is erected to keep off cattle from a lawn, and which does not conceal the riew, is termed a "ha ha." When fouces are constructed of branches of thorns and bushes, without stakes, they are called foot hedges; when the branches are interwoven, and rods wattled in at the top, they are termed stake-andedder hedges.

FENCING, fen'sing (from the same root as defence and fence), the art of using skilfully, in attack or self-defence, a sword, rapier, or bayonet; but usually taken to mean address in the use of the second of these weapons. In actual personal combat the rapier is, or more pons. In actual personal combat the rapier 1s, or more correctly was, used, for its employment has gone out with the practice of duelling. In the school of sence the foil is wielded. The foil is a circular or quadrangular rod or blade of pliable highly-tempered steel, blunted and covered with leather at the point, so as to prevent accidents in its practice. In length it varies between thirty-one and thirty-eight inches, and, for the purposes of the art, it is divided into two parts,—the forte, which occupies the half of the blade ending with the hilt, and the faible, which occupies the other half a league to enable all persons to obtain justice by forte, which occupies the half of the blade ending with their means, and to prevent them from seeking it from the secret tribunals. Their influence, however, was not entirely destroyed until the public peace was established in Germany, and an amended form of trial and penal judicature introduced. Goethe, in his "Goetz construction of the mass given an account of the workings of these secret tribunals; but the best historical account of them is by Paul Wigand, "Das Folmgesicht Westfalene," Harmm., 1825.

FERINTIER, fem'-e-mia (Lat. femina, a woman), is the opposite of masculine, and masns pertaining to a woman or women. Words are said to be feminine in grammar when they denote females, or have the termosting the micro denote the half of the blade ending with the hilt, and the faible, which occupies the half of the blade ending with the hilt, and the faible, which occupies the half of the blade ending with the hilt, and the faible, which occupies the half of the blade ending with the hilt, and the faible, which occupies the half of the blade ending with the hilt, and the faible, which occupies the half of the blade ending with the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the half the hilt, and the faible, which occupies the half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the other half the hilt, and the faible, which occupies the half the hilt, and the faible terminating with the button. During the patient, and the faible te

#### Fennec

ment in the armour worn by knights in battle; from which circumstance battle-axes and other ponderous weapons of offence were substituted for the sword. When metal casing became somewhat, if not altogether disused, fencing came once more into vogue; and, as all disused, fencing came once more into vogue; and, as all gentlemen wore swords, and quarrels were matters easily got up, it was absolutely necessary that all should have some knowledge of the "fence." The peculiar state of society in Italy made this even more needed than in any other country, and it followed that the Italians became the best fencers in Europe. Spain next found the art necessary, and soon France, in which latter country it created such a favourable impression that a school was astablished for its necessor. pression that a school was established for its prosecunon, and new improvements were found out every day in the science. The early Italian and Spanish schools laught the management of the sword, aided, generally, by the dagger or the mantlet; the shifting of the position of the fencer was also necessary to avoid attack. But since the habit of wearing the dagger and manulet has been abandoned, and the velocity of attack and defence become so great, instruc-tion in fencing has been strictly limited to the foil, and shifting position would be fatal to one engaged. The Italian foil is some thirty-eight or forty inches long, which the French is shorter, being only thirty-four inches, generally, in length. In fencing there are three openings or entrances,—the inside, comprising the whole breast from shoulder to shoulder; the outside, which can be attacked by all the thrusts made above the wrist on the outside of the word; and, finally, the low ports, which embraces the armpits to the hips. In a work of this description it would be impossible to give all the different attacks and defences; the following, however, are the principal:—First, the carte is a guard which is shown by turning the wrist with the nails upwards, and the hand in a line with the lower part of your breast, the arm somewhat bent, the elbow inclining a little to the outside, and the point of your foil directed towards the upper part of your adversary's breast at an angle of about 15°. The thrust, bunge, or longe, is an attack. When at the guard in carte (as just shown), straighton the arm, raising your wrist above your head, keeping the point of your foil still pointing to your adversary's breast, and then thrust out first the wrist and then the whole body by a "lunge" of the right foot some two feet from the of the right foot some two feet from the lunge guard; your left foot remaining firm all the time. The purado is formed by moving your sword over from your guard, when received, obliquely downward to the right about six inches, and opposing the inside of your foil to your adversary's blade. The seconde is shown by holding your nails and wrist downwards, hand opposed outwards; and the blade should form an angle of \$5° with the ground, pointed low. Feints consist in threatening an attack on one side of your foil and executing it on the other. There are many varieties of these, and the best defence is the half-circle parade, which is done by straightening your arm with your wrist on a line with your shoulder, and by a quick motion of your wrist, sweeping the point of your foil from right to left; thus covering your body from head to knee, and obliging your adversary once more to come to position. The calvary sword-exercise is but another instance of fencing applied on horse-back, and the bayonet exercise, in point of fact, may be regarded in the same light.

Fennic, fon'-nek (Vulpes zaarensis; Canis Zerdu

of Zimmermann), belonging to the carnivora, and chiefly found in Nubis and Egypt. This suimal, which has given rise to much controversy, is generally placed by the French zoologists among the foxes; but the observations of Mr. Yarrell led him to pronounce decidedly that the feunec appears to him to belong to the genus Canis, the osteological part of its structure closely resembling that of the dug, and the pupil of the eye being circular. The fennee is of slight build, and seldom measures more than a foot in length, exand seidom nessures more than a foot in length, exiduence of a small portion of organized matter when clusive of the tail, which is fox-like and husby, and is in itself in an actient state of alteration. This active pale fawn, with a slight touch of jetty black at the base and extremity of the tail. Although without though the carnivorous animal, the fennee is especially fond of the fruit of the date-palm, and is especially fond of the fruit of the date-palm, and is are necessary; for instance, the presence of water and said to be able, and frequently to exercise his ability, to

# Fermentation

olimb the lofty trees, and gather the dates. Bruse, who claims the honour of introducing the fennec to zoological science, asserts that it builds its next in trees. In latter times, however, it has been certainly ascertained that it burrows like the foxes. It is of nocturnal habit.

FENNEL. (See FORNICULUM.)

FROFFILE (Over TENIOULUM:)
FROFFILENINI, felf-ment (Lat. feoffamentum, from the verb feoffare or infeudare, to enfeoff, or give one a feud), in Law, is applied to the most audient and solemn method of conveyance. It is defined to be "the conveyance of any corporeal hereditaments from "the conveyance of any corporeal hereditaments from one person to another by delivery of the possession of the hereditaments conveyed, and evidenced by an instrument in writing;" for since the Statute of Frauds, 29 Car. II. c. 3, no valid feediment can be made without a written instrument. The person that so gives or enfectfs is called the feetfor, and the person so enfeoffed is termed the feetfor. And the person so enfeoffed is termed the feetfor, and the person is enfectfied is termed the feetfore feetform, called livery of seisin, without which the feetfee had but an estate at will. This was the actual delivery of a portion of the land or real hereditaments conveyed, as a estate at will. This was the actual delivery of a portion of the land or real hereditaments conveyed, as a twig or a turf, to testify to the reality of the act; or, the parties being within view of the land, the feoffor, referring to it, gave it to the feoffee. This latter mode of delivery was ineffectual unless the feoffee entered into possession during the life of the feoffor. This mode of conveyance may be traced up to the earliest antiquity, and has been common among most rude nations. Livery of seisin was anciently performed before the freeholders of the neighbourhood, who might afterwards bear witness, in the event of any dispute. Afterwards, however, the livery was made in pre-Alterwards, nowever, the livery was made in presence of any witnesses, who attested such delivery in the body or on the back of the deed. Feofiments are now little used, and actual or symbolical livery of seisin is rendered unnecessary by 8 & 9 Vict. c. 106, by which corporeal hereditaments are made to be in corporate and the best of the second of th grant as well as in livery, and which declares that a feoffment shall not have a tortuous or wrongful effect.

Ferm, fe'-re (Lat. ferus, wild), a term employed by Linneus to distinguish the order of mammalia which subsist more or less exclusively upon the flesh of other animals. They have three rows of teeth,—incisors, canines, and molars; unguiculate extremities, without an opposable thumb on the fore foot, but with the power of rotation in the fore-arm. The order of Force

prover of rotation in the fore-arm. Into order of rever-corresponds with the insectivors, and the plantigrade, digitigrade, and pinnigrade carnivors of Cuvier's Car-nassiers. (See Carrivors.) FERE NATURE, fe'-re natu'-re (Lat., of a wild nature), a term applied in Law to wild animals, or such as retain their natural disposition of freedom, as distinguished from such as are tame or domestic. The law holds that a man can have no absolute property in animals feræ nafuræ. There may be, however, a qualified property in these animals, either per industriam, propter impotentiam, or propter privilegium. Per industriam, by a man's reclaiming and making them tame by art, industry, and education, or by so confining them within his own immediate power that they cannot them within his own immediate power that they cannot escape and use their natural liberty. These are a man's property only so long as they remain in his keeping; and if they should regain their natural liberty, his property ceases, unless they have animum reverlend, or are in the habit of returning. Propter impotentiam arises from the inability of the animals; as where such animals burrow or nestle on my land and have young them. I have a unified are written there. there, I have a qualified property in these young ones till they can run or fly away. Propter privilegium; as where a man has the privilege of hunting, taking. and killing them, to the exclusion of others, as in the case of game. (See Game Laws.)

FREMENTATION, fer'-men-tail-shan (Lat. fermentatio),

in Chem.-Fermentation may be defined as a decomposition undergone by organic matter, through the influence of a small portion of organized matter which is in itself in an active state of alteration. This active

#### Ferment Oils

principal kinds of feamentation,—alcoholic or vinous, lactic or batyric, and viscous alcoholic farmentation. When the juices of plants or fruits containing sugar are kept at a temperature of 70° for several hours, the liquor becomes turbid, and small bubbles of gas make their appearance; in common language, it has begun to work or ferment. Under the combined influence of warmth, moisture, and oxygen, the albumi-nous matter has become decomposed, and a change is commenced, which, after it has once begun, continues until the whole of the gas has been eliminated. If the gas is collected, it will be found to consist of carbonic acid only, and on distilling the fermented liquor, a spirit lighter than water passes over, which is readily recognized as dilute alcohol. If the liquor be further examined with a microscope, it will be found to contain a number of oval organized bodies in the form of tain a number of oval organized soules in the form of cells, a full description of which will be found under the head of Ykasr. This yeast is the ferment in this instance, and if dried at a low temperature, it will preserve its power of exciting fermentation for a great length of time. Its power is stopped by several chemical agents; such as the strong mineral acids, the alkalies, excess of sugar, certain corrosive metallic salts, kreesote, carbolic acid, and the essential oils. The change taking place in the sugar may be rendered plain by the following :-

Fruit-sugar. Carb. Acid. Alcohol. = 4CO<sub>2</sub> 2(C,H,O,) C, H, O,

It was considered at one time that the change that bread undergoes during panification was a distinct kind of fermentation. It has now been ascertained that it is only a modification of the alcoholic fermentation produced by the action of the yeast upon the starch and sugar contained in the flour. Luctic fermentation. -Milk may, by being kept at a warm temperature, be converted into a spirituous liquor, by the change of the sugar of milk first into fruit-sugar and then into alcohol by the action of the azotised constituents contained The change which more commonly takes place, when milk is allowed to ferment, is the transformation of sugar of milk into lactic acid. Other animal bodies are capable of effecting the same change in a shorter time; the use of rennet being a familiar example. time; the use of rennet being a lamiliar cample. Caseine, in like manner, is used for a similar purpose; butyric acid being easily made by fermenting sugar, cheese, and chalk together in certain proportions. Viscous fermentation.—Liquore containing sugar often pass into a ropy or thick condition, from the transfor-mation of that body in a mucilaginous substance. No escape of gas takes place, but the liquid loses its sweet The mucilaginous substance has not yet been tasta. thoroughly examined, but its formation is evidently connected with the electrical conditions of the air; examples of which are familiar in the instances of and beers turning thick and sour during a thunderstorm. The change of alcohol into vinegar is not a true fermentation, but a simple absorption of oxveen.

FERMENT OILS .- By submitting certain plants to fermentation, volatile oils are obtained. These products were termed quintessences by the alchemista. Ordinarily they are obtained by the simple process of ordinarily they are obtained by the aimple process of steeping the plant's in water and allowing them to ferment. In Watts's "Dictionary of Chemistry" the following ferment oils are described:—Chemophyllum; sylvestre, wild chervil, common paraley; Chelidonium; augius, the larger celandine; Conium muculatum, common hamlock: Emblosa Centumium; little control of the common hamlock of the common hamlock. mon hemlock; Erythrea Centaurium, little centaury; mon hemlock; Erythrea Centaurium, little centaury; Echium vulgare, viper's bugloss; Erica vulgaris, common heath; Marrulaum vulgare, white horehound; Achillea Millefolium, common yarrow; Plantago, the plantain; Quercus Robur, oak; Sulia pentantra, the willow; Salvia pratensis, meadow-suge; Trifolium fibrinum, the clover; Tussilago Farfara, colt's-foot; Vilis vinifera, the vine; Urtica ureas, the nettle; and diseased amles.

diseased apples. (See FILIORS.) FERN.

FERN. 2007. (See LASTERA.)
FERNIZA, fe-ro'-ni-a, in Bot., a gen. of the nat. ord.
Aurantiacea. The species F. elephantum is a large
tree, growing in India. A kind of gum, closely resembling gam-Arabic, exudes from its stem, and it is very probable that this constitutes part of the East-India

## Ferrocyanogen

gum imported into this country. The young leaves have an anise-like odour, and are used by the native doctors of India for their stomachic and carminative effects. The fruit is known as the elephant or woodapple.

FERRER, fer'-ret (Dp. vret, Fr. furet), Mustela Furo, Linn.).—This well-known animal is a native of Africa, but domesticated in Europe. Its habits are similar to those of the weasel, but more bloodthirsty. Its length is about fourteen inches, exclusive of the tail, which measures about five and a half inches; amout sharp; eyes red and fiery; colour commonly pale yellow, but sometimes partaking of all the colours usual in the weasel kind. In slightness of body and shortness of leg it likewise resembles the weasels. Ferrets are chiefly used to hunt rabbits. Courageous, however, as is the ferret, there is not more than one in ten who is a really good "ratter," or, indeed, that can be induced to enter a rat-burrow. The same timid animal, how-ever, will, without invitation, scamper into a rabbit burrow; and for this very good reason, that whereas, especially if there be many litters of young rats in the colony, the old animals will show desperate fight with the intruder, the rabbits will never, on any chance, turn on it, but rush headlong away. In the pursuit of this latter sport, it was the custom in olden time to see the lips of the ferret together before it was turned into the rabbit burrow, and so prevent it doing anything but sears them out of the hole and into the hands of the watcher at the mouth of it. In old books of "sport," there at the mouth of it. In old books of "sport," there are elaborate instructions as to how the ferret should be held while his lips are being sewn, together with the acrt of needle to be used. The modern system, how-ever, is to muzzle or "cope" the ferret. This is accomplished by the use of two pieces of soft string, one of which is passed round the neck, and the other under the jaws, the four ends meeting at the back of the week, and being there tied. Cold is fatal to the domesticated ferret. It breeds twice a year, the production rauging from six to nine young ones at a litter. Sometimes the female will eat up her young, and in that case she is likely to litter three times in the year. The period of gestation is six weeks. The young are born and continue blind during an entire month, and at three months old are considered fit for "work."

FREEIC ACID, fer-rik (Lat. ferrum, iron), FeO, in Chem.—If one part of scaquioxide of iron and four of Onem.—If one part or sequencine or from an loar or intre be fused together for seme time, a brown mass is obtained, giving a violet-coloured solution, containing ferrate of potash. Ferric acid has never been obtained in a free state, but solutions of the ferrates of the earths may be formed readily by mixing ferrate of potash with these salts.

FREEDOMANGER, fer'-rid-si-dn'-o-jon (Lat. ferrum, iron, and cyanogen), C<sub>12</sub>N<sub>c</sub>Fe<sub>2</sub>, or Fdcy, in Chem., a hypothetical radicle derived from cyanogen, giving rise to salts known as ferridcyanides, a good example of which is met with in the ferrideyanide of potassium, or red prussiate of potash of commerce, which is formed by passing chlorine through a solution of yellow prussafe of potash. Ferridoyanide of potassium is pre-pared in large quantities for the use of the calico-printer. When added to solutions of the persalts of iron, it gives no precipitate; but a very splendid dye, known as Turnbull's blue, is formed by mixing it with a solution of protosulphate of iron. The other ferridcyanides are unimportant.

FERECTANGER, fer'ro-si-dn'-o-jen (Lat. ferrum, iron, and cyanogen), C.N. Fe, or Fey, in Chem., a hypothetical radicle derived from cyanogen, giving rise to salta known as ferrocyanides, of which the ferrocyanide of potassium, or yellow prussiate of potash, may be taken as an example. The salt of commerce is nearly in a state of purity, and is manufactured on an enormous scale for the use of colour-makers and an enormous scale for the use of colour-makers and calico-printers, by heating dried blood, bones, parings of hides, and other nitrogenous animal matter, with an equal weight of carbonate of potash and one-third of fron filings. The carbon, nitrogen, and fron units with the potassium to form a yellow sait, crystallizing in large tabular crystals, containing three equivalents of water. It is very soluble in water, but insoluble in alcohol. Althougu it contains the elements of prussic acid when in solution, yet it is not poisonous. Distilled with sulphuric soid, it furnishes prussic acid

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# Ferry

in large quantities. It is much used in calico-printing in large quantities. It is much used in calico-printing and solour-making for the production of a fine blue colour, known as Prossian blue, with the persaits of iron. When protosalts of iron are used, a dirty greenish-white precipitate falls down, which constitutes one of the distinguishing tests between the per and proto-satts of iron. It is also largely employed in the manufacture of cyanide of potassium; in fact, it is the only commercial source of that salt. With copper, it forms a characteristic purple-brown precipi-tate, and is used as a confirming test for saits of that metal. With the saits of cobalt it gives a yellowish-

green precipitate.

FERRY, fer'-re (Lat. ferre, to carry), in Law, is a right, arising from royal grant or prescription, to ogry men and horses across a river or arm of the sea for a reasonable toll. The owner of a ferry is bound to keep a boat always in repair and readiness for the use of her Majesty's subjects, for neglect of which he is liable to be indicted. On the other hand, if a ferry be erected so near to an ancient ferry as to draw away its custom, it is a nuisance to the owner of the old one, for which the law will give him remedy. No public ferry can be established without a license from the crown. Bridges have taken the place of ferries to a great extent, and they are only found in the present day over streams running through flat districts, or in places where the traffic is not sufficient to warrant the outlay which would be incurred in erecting a bridge. They are also found at the mouths of tidal rivers, where a bridge would interfere with the passage of where a bridge would interier with the passage of vessels, or its construction would be attended with considerable engineering difficulties. A ferry formerly existed where London Bridge now stands, the profits of which formed part of the endowment of a nannery, which stood on the Southwark side of the water, on, or near, the site of St. Saviour's Church.

FERRY-BRIDGE, a boat or barge of great size and peculiar construction, adapted for the transportation of horses and carriages, as well as foot-passengers, across a stream from one bank to another. The ferry-bridge or floating bridge, as it may be indifferently termed, consists of a level platform laid like a deek on a strongly-built flat-bottomed vessel, square at both ends. This deck or platform is furnished with railings on either side, or bulwarks boarded over, and it has a on either side, or bulwarss boarded over, and it has a lap of timber attached to each end by hinges, which can be raised or lowered by chains. These laps are allowed to rest on the land when the ferry-bridge touches the shore, to afford a safe and easy means of entrance and exit for carriages and horses. Bridges of this description are worked from side to side by means of a chain tion are worked from side to side by means of a chain fastened at either end to posts placed for the purpose in the landing-places. If the distance across he short, the chain is passed round a wheel, which is turned by the ferryman; but in floating bridges placed at the entrance of tidal rivers, where the distance from hank to bank is often considerable, the chain is passed round a barrel or capstan, which is worked by horses or steam power. Ferry-bridges of this description are used to convey vehicles across the river Tamar at Saltash, in Cornwall, and across the Dart at Dartmouth, Devon.

FERULA, fer-a-lá (Lat.), is the classical appellation

mouth, Devon.

FREULA, fer'-u-lā (Lat.), is the classical appellation of a wand or rod. In the time of the Eastern empire, the ferula was the name given to the emperor's sceptre. It consisted of a long stem with a flat head, and it is often to be seen depicted on old medals.

FREULE, fer'-uis (Lat. ferio, I strike), is used to signify a little flat wooden slice or pallet for punishing children at school, by striking them with it on the palms of their hands. It is often applied, too, to a species of cane which is used for the same purpose of castiration.

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Fiscennime Verses, fest-sen-nine, were a kind of rude, licentious poetry, common in ancient Italy, and said to have derived their name from the Etrurian city of Fescennium. They were in the form of dialogues between two persons, who satirized and ridiculed each other's follies and vices. They were sung on festive occasions, particularly at weddings, but were distinct from the epithalamia, which were more refined and ragular compositions. The emgeror Augustus prohibited them, as tending to corrupt the public morals.

Firstivals. (See Feasts.)

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# Feudal System

FESTOON, fes-toon' (Fr. feston).—Htricity speaking, this word means a garland or wreath; but in architecture, sculpture, &c., it is applied to designate an ornament composed of flowers, fruits, and leaves interwoven or twisted together, suspended at each end. Fartcurst, fet-sh-trm, is the worshipping of a fetich. The word fetich is said to be derived from the

Portuguese word frieso, bewitched or possessed by fairies, and was applied by them to the objects worshipped by the negroes of Africa. Hence the term has come to be generally received, and is applied to the ascription of life and intelligence to insminute objects, as stones, carved images, &c. Fetichism, then, is the worship of material substances, a form of idolatry that prevails very extensively among barbarous nations, and especially those of the negro race.

and especially those of the negro race.

Frilox, fet'lok (Ang.-Sax., from footlook), a tuft of hair which grows behind the pastern-joint of most horses; horses of diminutive size, however, have hardly any tuft. The term is now more generally applied to the joint on which the tuft in question grows.

Frud., fude (Ang.-Sax.), denotes a deadly quarrel or enmity subsisting between one tribe or family and another. They formerly prevailed extensively among the northern nations of Europe, and were a combination of kindred to revenge the death of any of their blood against the player and all his race, and were frequently against the slayer and all his race, and were frequently

against the mayer and as his race, and were frequency kept up for many generations.

FRUDAL SYSTEM, fu'-dail sis'-tem, is that constitutional system which was introduced into Europe by the northern nations after the fall of the Roman power, and which has left important traces of its existence in most European countries. The constitutional fall had be a first and the military relies of tion of feuds had its origin in the military policy of the Goths, Huns, Vandals, and other norther nations, who overran Europe at the declension of the Roman empire. The term fend is of very doubtful derivation, but most probably it is formed from the Teutonic Jes or feh, wages or pay for service, and odh or od, property or possession; a feud then being the property or possession given as wages for service. In order to or possession given as wages for service. In order to secure their newly-acquired possessions, and at the same time to reward their deserving followers, the conquering generals were wont to allot large districts, or parcels of land, to the superior officers of the army, and these were by them dealt out again in smaller allotments, or parcels, to the inferior officers and soldiers. The condition annexed to these holdings allotments, or parameter and the second to these holdings soldiers. The condition annexed to these holdings was that the possessor should do service faithfully, both at home and in the wars, to him by whom they were given; for which purpose he took the oath of fealty (paramentum fidelitatis), and in case of the breach of this condition and oath, by not performing the stipulated service, or by deserting the lord in battle, the lands were again to revert to him who maked them. The ownership of the land, therefore, battle, the lands were again to revers to man granted them. The ownership of the land, therefore, properly remained in the hands of the superior, and the superior of the superior of the superior of the superior was resumable by him at pleasure, probably at first was resumable by him at pleasure, or at least on the death of the holder; but, in most countries, lands soon came to assume an hereditary character, the rights of the superior, on the death of a vassal, being confined to the exaction of certain dues from his son and successor, as a consideration for confirming to him the feud which his father had held Where the land descended to a female, the superior was entitled to control her marriage for the purpose of procuring a trustworthy vassal, a privilege which, of procuring a trustworthy vassal, a privilege which, like the other, was afterwards converted into a pecuniary payment. According to this system, every receiver of land, or feudatory, was bound, when called upon, to serve his immediate lord or superior, and to do all in his power to defend him. Such lord or superior was likewise subordinate to; and under the command of, a higher superior or lord; and so on upwards to the prince or general himself. The several lords were also reciprocally bound in their respective gradations to protect the possessions they had given. Thus the coanection between lord and vassal was made to wear all the appearance of a mutual inter-Thus the connection between lord and vasual was made to wear all the appearance of a mutual interchange of benefits,—of bounty and protection on the one hand, and of gratitude and service on the other. In this way the feudal connection was established, and an army was always at command, ready to fight in defence of the whole, or of any part, of the newly-acquired country. The wisdom of these measures

became evident to the other princes of Europe, and many of them who were independent adopted this system as a means of strengthening their power, parcelling out their royal territories, or persuading their subjects to surrender up and retake their own isnded property under the like feudal obligations of military featly. Thus the foudal constitution, or doctrine of them the strength of the Western world; and tenure, extended itself over all the Western world; and tenure, extended itself over all the Western world; and the feudal laws drove out the Roman, which had hitherto universally prevailed. This system was adopted in most countries of Europe from the 9th to the end of the 13th century; but it differed in various particulars in the different countries. Though there can be no doubt that feudal principles prevailed to a considerable extent in the polity of the Saxons in England, yet it was only when that country was conquered by the Normans that it was regularly established. in some respects, however, the system of feudalism established in England differed from that of France, from which it was taken. One of these was that the king was the universal lord and original proprietor of all the lands in his kingdom, and that no man could possess, or hold, any part of it, but what was mediately or immediately derived from him, to be held mediately or immediately of him upon feudal service. Hence the Conqueror introduced the practice of compelling those holding mediately as well as immediately of himself to swear fealty to him; and thus the inferior vassals were under two oaths,—the one of fealty to the king, the other of fealty to their immediate superior. It has been remarked, however, that when the two interests came into collision, the vassal rarely failed to obey his lord rather than his king. The wardship, or guardianship of the tenant during minority, which implied both the custody of his person and the appropriation of the profits of his estate, was another feature of English feudalism which did not exist in the French. In England, the whole country was divided into about 60,000 knights' fees, the tenant of each of which appears to have been obliged to keep the field at his own expense for forty days, whenever his lord chose to call upon him. For smaller portions of land, emaller periods of services were due. Every great smaller periods of services were due. Every great tenant exercised a jurisdiction, civil and criminal, over his immediate tenants, and held courts, and adminis-tered the laws within his lordship, like a sovereign prince. The existence of manor-courts and other small jurisdictions within the kingdom is one of the sman jurisdictions within the kingdom is one occurs features of the feudal system. The land eschested to the lord when the tenant left no beir, and it was for-feited to him when he was found guilty either of a breach of his oath of featty or of felony. There were breach of his oath of fealty or of felony. There were also fines payable to the lord on certain occasion, as well as aids, reliefs, &c. The vassal had also to attend the lord's courts, sometimes to witness, and sometimes to take part in, the administration of justice; in battle, he was bound to lend his horse to his lord if dismounted, to keep to his side while fighting, and go into captivity as a lostage for him when taken. It was a breach of faith to divulge his (the lord's) counsel, to conceal from him the machinations of others, to injure his person or fortune, or to violate the sanctity of his roof.

FEU DB JOIR fulde(r)-zhwan a term derived from

sencity of his root.

FEU DE JOIE, fu'-de(r)-zhwaw, a term derived from
the French, and applied to bonfires lighted in public
places and in villages, to celebrate any important event
or feative season. These feux ds jois were known
amongst the Romans, as Romulus instituted a species of
them, particularly in honour of the building of the city
of Rome. The term feu de jois is also often applied to
a salute fired on any particular occasion, in celebration
of festivals, &c.

of festivals, &c.

Fruillars, five'-yöns, in Ecol. Hist., is the name of a reformed branch of the Cistercian order of monks. It was founded by Jean de la Barrière, abbot of the Cistercian monastery of Feuillans near abbot of the Cistercian monastery of Feuillans near laxivy of discipline that then prevailed, introduced a much more austere mode of life. He soon found many followers, and they were declared independent by Sixtus V. in 1696. They were afterwards divided, in 1690, into two congregations by Pope Urban VIII., who separated the French from the Italians, and gave them increased heat and 1630, into two congregations by Pope Urban VIII., who separated the French from the Italians, and gave them without the payent is said to be without fever; two generals. They practised great austerities, going barefoot, and living only on heads. The cloister of the seven course as a particular disease of itself, barefoot, and living only on heads. The cloister of the cister of the vascular system and the condition of the blood itself. When, indeed, the term fever is used in a general sense to denote a general disorder consequent upon or symptomatic of come local disease, then increased heat and losso, into two congregations by Pope Urban VIII., who seems the french from the Italians, and gave them

this order at Paris gave name to the celebrated political club which, during the French revolution of 1789, held its meetings there. It was founded in 1790, by Lafayette, Sièves, Larochefoucauld, and others, and was intended to support the constitution against the ultra party. When Count Clermont Tonnerre was elected president of this club, a popular insurrection broke out against it; and on the 28th of March, 1791, the Assembly in the cloister was dispersed by the mob.

FRUILLERON, fully-we ton(q) (Fr.), is properly a small

The Liketon, full-lye ton(g) (Fr.), is properly a small leaf, but is generally applied to that part of a political newspaper which is devoted to news of a non-political newspaper which is devoted to news of a non-political newspapers which is commonly, in continental newspapers, to be found at the bottom of the page. The feuilleton is an invention of the Journal des Débats, which, in 1800, introduced the system of giving literary criticisms in this form. Afterwards the bolles-lettres element began to prevail in the feuilleton, and Jules Janin became the acknowledged king in this class of literature. In the years immediately preceding the revolution of February, whole romances were spun out in the feuilleton; and in particular, the Constitutionnel made large sums from the social romances of Engene Sue, which it first published in this way. The French system has been imitated in England and Germany, though not to the same extent, and with less marked success. In fact, the feuilleton propers seems only to be in its natural element in France. The language and the character of the people are peculiarly fitted for imparting that grace, point, neatness, and vivacity that give a peculiar charm to the higher productions of this class of literature, and which draw additional power from their many-sidedness and frequent changes.

Faver, fe'-ner (Lat. febris, from ferres, I am hot), in Med., is the name given to a very numerous and important class of maladies, which, however diversified in their several characteristics, still present something in common in their general features. It is impossible to give a general definition that will apply to all the different varieties and forms of this class of diseases; but, among the features that are almost always present are spontaneous and painful lassitude, weakness of the corporeal and mental faculties, alterations of the secretions, altered animal heat, quickened circulation, and increased thirst. One of the earliest and most constant symptoms of fever is lassitude, and is usually attended by a painful or irksome sensation in the back and limbs. It is manifestly referable to a depressed and limbs. state of the nervous energy, more particularly as regards the organic nervous system. To this depressed state of the nervous energy that weakness of the corporeal and mental powers which often precedes the evolution of the disease, and always in some degree attends it, is to be attributed. It is usually manifested more in the corporeal than in the mental faculties, particularly at first. Some of the mental powers are more affected than others; as attention and the reasoning faculties, than the imagination. Alterations of the secreting and excreting functions are among the earliest and most constant, and most important phenomena of fever. The exhalations from the lungs and skin are the earliest and most affected; but, besides these, the salivary, gastric, hepatic, intestinal, and urinary secre-tions, are more or less altered as respects either tions, are more or less altered as respects either quantity or quality; the alterations being somewhat different in different types and states of fever. The temperature of the body is also variously affected in the different stages. At first it is usually below, but it soon after rises above the normal condition, and is generally accompanied with a certain morbid accompanion which it is difficult to describe. Onickned sensation which it is difficult to describe. Quickened circulation has generally been regarded as one of the most essential symptoms of fever; but this feature is not constantly present, at least in some stages of the disease, and it is often of less importance than other states of the vascular system and the condition of the blood itself. When, indeed, the term fever is used in a general sense to denote a general disorder consequent upon or symptomatic of some local disease, and not a primary or idiopathic disease, then increased heat and and are always associated with others which are usually more important. Thirst is seldom wanting in fever, except occasionally in its advanced state; and the appetite for food is also diminished or entirely shoulshed. Medical men distinguish various stages or periods in the course of fever which are characterized by features more or less marked; sa, (1) the formative or precursory stage, the earliest stage of the disease, being sory stage, the earliest stage of the disease, being characterized by those early changes which are productive of those which constitute the developed disease; (2) the stage of invasion, when the earlier symptoms of the disease itself manifest themselves; (3) the period of excitement or reaction, when fever in its more literal sense begins, and manifests its specific more hteral sense begins, and maniests its specime form; (4) the period of orisis, when a sudden change takes place in the course of the disease, known as the crisis; (5) the period of decline which succeeds the crisis, and which passes into the (6) last stage,—that of convalescence. Fever presents itself in a great variety of forms, the simplest of which is what is termed ephemers, or one day's fever, because it seldom lasts above twenty-four hours. It begins with chilliness or rigor, paleness, weariness, and a frequent small pulse, withindifference to food. These symptoms are followed. in half an hour or a little more, by heat of skin, a flushed face, frequent hard pulse, occasionally headache, and a peculiar sense of fatigue, restlessness, and slight sore-ness of the muscles. After this state has continued for peculiar sense of fatigue, rectiessness, and sugar sorress of the muscles. After this state has continued for twelve or eighteen hours, or at most twenty-four, gentle perspiration breaks out, under which, in the course of little more than an hour, every essential symptom vanishes, leaving only a feeling of exhaustion and muscular debility. This is the simplest and slightest form of fever; and though, on account of its sugness form of rever; and though, of seconds of its shortness, it seldom attracts much notice, yet it is by no means uncommon in this country, particularly during the spring months. If such an affection be supposed to recur several times every other day, with an interval of comparative health in the intervening days, a clear notion will be formed of intermittent fever in its meet frequent and characteristic form,—the tertian; and from the tertian may be derived all the other forms of intermittent fever. If, in the next place, the febrile state be conceived to be reinforced twice a day, or oftener, by a fresh attack of rigor or chilliness, with subsequent reaction before the pre-existing pyrexis had materially subsided, a distinct conception may be formed of remittent fever. From the remittent fever most nosologists deduce the only remaining primary type,—continued fever, by supposing the remissions to become gradually less and less distinct; but others, with perhaps more reason, regard them as ephemers, merely prolonged to such a duration as that its several stages occupy between four and nine or eleven days. In accordance with these remarks, what are known as primary fevers may be divided into three classes. continued, intermittent, and remittent fevers. continued, intermittent, and remittent fevers. The first class comprises synocha, or inflammatory fever; synochus, mixed, or nervous fever; and typhus, or adynamic fever. Intermittent fevers are divided into tertian, quotidian, and quartan; while remittent fevers comprise the marsh remittents, and probably also the comprise the marsh remittenes, and probably also the veillow fever. Besides primary fevers, there are the irruptive class of fevers, comprising the small-pox, measles, and searlet fever; and the irritative fevers, comprising gastrio fever and gastro-intestinal, remittent, and hectic fever.—Ref. Copland's Dictionary of Medicine.

Fians, fe'-are, in Scotland, are the annual average prices of grain, determined in each county so as to regulate crown duties, ministers' stipends, and the rents of agricultural subjects, where these are made to de-pend upon the price of grain. The derivation of the word is uncertain, and, according to Dr. Jamieson, it is of Gothic origin. They were originally instituted in Scotland for the purpose of ascertaining the value of the victual or grain-rents payable to the crown, and were at first determined annually by the exchequer, upon returns made of the prices of grain by the sheriffs of the different counties. Afterwards it was left to the sheriffs themselves to determine the flars prices in their several counties, who summoned a jury for that purpose. Fiars appear to have been struck in Scotland as early as the middle of the 18th century; and the form of procedure is regulated by an act of

sederunt, dated 21st December, 1733, and renewed 29th February, 1728. This act requires I the sheriffs of Scotland and their deputies yearly, between the and 20th of February (O. S.), to summon before them a competent number of persons living within the sheriffdom who have knowledge and experience of the prices and trade of victual in these bounds, and from them to choose fifteen men, whereof not fewer than them to choose fifteen men, whereof not fewer than eight shall be heritors, to pass upon the inquest, and return their verdict on the evidence underwritten, or their own proper knowledge, concerning the flare of the preceding crops of every kind of vintual of the product of that sheriffeum; and the said sheriffs and their deputies shall to the same time and place unto which the jury is called, also summon the properest witnesses, and adduce them and all other good evidence, before the said jury, concerning the price at which the several sorts of victual have been bought and add cenedially since the lat of November immed. and sold, especially since the 1st of November immediately preceding until that day;" "and any persons then present may in open court and no otherwise, and observing due order and respect, offer information to the jury concerning the premises and concerning the evidence adduced or that might be adduced before them." In Scotland a great many contracts are regulated by the flars prices. In letting farms on lease, it is often arranged that the whole, or a certain portion it is often arranged that the whole, or a certain portion of the rent, be paid in grain, or according to the value of so many boils of wheat or barley, as fixed by the flars; so that in the event of a greatfall of prices during the currency of the lease, the tenant should not suffer; and, on the other hand, that the landlord should resp a fair share of the advantage of a rise of prices. like manner many foundations, the stipends of the es-tablished church clergy, the salaries of parochial schoolmasters, &c., are made to depend more or less upon the flars prices. It is the interest, therefore, of those who have to pay, that the flars be struck as low as possible, and of those that are to receive, that they be as high as possible; and hence they are determined with a considerable degree of accuracy, generalized. rally, it is believed, rather under than over the mark. It is thought, however, that the period fixed for taking the averages is too early, there not being much of the grain of the previous crop brought into the market by that time.

Firs, f'-dt (lat., let it be done), in Law, denotes a deree, a short order or warrant of some judge for making out and allowing certain veccasion.

Filt, in Bankruptcy, denoted the authority of the lord chancellor to a commissioner of bankrupts to proceed in the bankruptcy of the trader therein men-tioned. It was abolished by 12 & 13 Vict. c. 106, and

a petition for adjudication substituted.

a pectaon for adjudication substituted.

Fiber, \$f^\* br (Lat. fbru), a term applied to animal, vegetable, or mineral substances which have a stringy or thread-like structure. In a general sense, it includes the hair and wool of quadrupeds, the threads enwrapping the ocooons of silkworms, &c., the fibres of the leaves of plants and of their inner bark, the elongated cells or hairs connected with the seeds of plants, and the ordinary materials used in making cordage and textile fabrics. Mineral substances are called fibrous in structure, even when it is impossible to detach the apparent fibres. The only fibrous minerai which has been used for textile fabrics is Amianthus, a variety of asbestus; but that only to a very limited extent. The animal substances used are divided into extent. The animal substances used are divided into two classes; the first including hair and wool, and the second the silk of occoms. Nearly all textile fabrics are made from the first, and the wool of the sheep is the most important division of the class. The hair of the goat, alpaca, camel, bison, and other animals, is also used. The hair of most animals is, however, in general, too short to allow of its being used for textile manufacture. The vegetable kingdom yields the largest number of useful fibres, which are obtained trom natural orders very different from each other. The serogeneous or cryptogamous plants do not, however, afford any. From erogeneous plants, fibres are obtained from the inner bark, as in the case of flax, hemp, &c., and from the hairs of the fruit, as in cotton. In endogeneous plants, the fibre is sometimes obtained from the fruit, as in cocca-mt fibre. The spathe of some palms is also used.

Some of the slander palms called from natural orders very different from each other.

## Fibrin

rattans, and the bulrush, &c., are much used, on account of their fibrous nature, for wicker-work, chair-bottoms, and similar purposes. The most valuable fibres obtained from endogenous plants come from the leaf or leaf-stalk. The fibres of the bark of exogens are readily separated, usually by steeping or continually moistening with water. As this process injures the colour of endogenous substances, the fibres are generally separated by beating or passing between rollers. Fibres obtained from fruits, as cotton fibre, like the wool and hair of animals, exist naturally in a separate state, and only require to be collected and cleaned. Amongst the useful vegetable fibres, those of flax, hemp, and cotton have long held the first place. The writing ladditions of late warm have heaven have long held the state of the warm have heaven have been New Zerosen and the state of the state principal additions, of late years, have been New Zealand flax, jute, Sunn or Sunn hemp, coir, Pits flax, Abacs or Manilla bemp, China grass, and some others. One of the most important uses of vegetable fibre is in the most important uses of vegetable fibre is in the manufacture of paper. Among exogenous plants whose fibres are used for economical purposes, are a species of gossypium which produces cotton; the Bombar villoam, which produces silk-cotton, or vegetable silk; and the Asclepias syriaca, producing the silk-like down of Virginian silk. These three substances are obtained from the fibres of the fruit. Those obtained from the inner bark include the following:—several species of Hibiagus, producing Deckapes hemp: the species of Hibisous, producing Deckanes hemp; the Corchorus olitorius, from which jute is obtained; the Linum usitatissimum, producing flax; several species of the Crotolaria; together with other leguminous plants, producing Sunn, Jubbulpore hemp, &c.; several species of Bohmeria, one of which produces China grass fibre; the Cannabis satica, producing hemp; and the inner bark and roots of some species of pine and fir. Among the endogenous plants from which fibres are obtained, are the Phormium tenax, yielding New Zealand flax; Agave americana, yielding Pita flax; some species of Musa, from the leaves of which are obtained Abaca or Masil, the men and alphabetic fibre are all the contractions. Manilla hemp, and plantain fibre; several species of Bromelia, from which are obtained pine-apple fibre, &c.; the husk of the cocos-nut and the fibre of the stem yield coir; and mata, chair-bottoms, and other important articles in general use, are obtained from the libre yielded by the leaves of the cotton-grass and other species of the nat. ord. Cyperaceæ (which see).

Figure, fi-brin (from Lat. fibra, a thread), one of the constituents of the blood, and of muscular tissue. It

contains, according to Mulder,—carbon 52.7, hydrogen 69, nitrogen 15.4, oxygen 23.5, sulphur 1.2, phosphorus 03. It occurs in two states,—liquid in the animal organism, and solid by spontaneous coagulation, as soon as it is removed from the living body. It is consome as the removed from the name body. It is contained in blood in a liquid state, in the proportion of 25 parts to 1,000, and coagulates in a very short time after the exposure of blood to the sir. It constitutes a large portion of muscle, arranged in bundles of fibres; whence its name. According to Liebig, it is found in the juices of plants and in the gluten of wheat. Mulder looks upon fibrin as a compound con-

wheat. Mulder looks upon fibrin as a compound containing protein. (See also PROTEIN COMPOUNDS.)
FIBULA. (See LEG.)
FICOIDER, fi-loi-de-e (Lat. ficus, a fig), in Bot., a synonyme for Mesembryacca (which see).
FICTION, fik-shun (Lat. fictio, from finge, I feign), in Lit. (See NOVEL, ROMANCES.)
FICTION OF LAW (Lat. fictio juris), is a supposition of law that a thing is true, without inquiring whether it be so or not, that it may have the effect of truth so far as is consistent with equity. They are common in the Roman law, and are not unknown in that of England. The fictions of the Roman law apparently had their origin in the edictal power, and they were devised for the purpose of providing for cases where vised for the purpose of providing for cases where there were no legal provisions. Fictions are resorted to in order to avoid a special hardship, or to remove some unexpected difficulty not provided for by the law. Their existence supposes a defect, which it is the business of legislation to remedy; and of late years many of them have been removed from our laws; years many of them have been removed from our laws; as in the proceedings in ejectment (which see). Fictions must be framed according to the rules of law, and not what is merely imaginable; and there ought to be equity and possibility in every legal fiction. "These fictions of law," says Blackstone, "though at first they may startle the student, he will find, upon 830

#### Fidei Commissum

further consideration, to be highly beneficial and useful; especially as this maxim is ever invariably observed, that no flotion shall extend to work an injury; its proper operation being to prevent a mischief, or remedy an inconvenience that might result from the general rule of law."

Flous, N-kee (Lat., a fig), in Bot., a gen. of the nat. ord. Moraceæ, consisting of trees and shrubs abounding in a milky juice. The most important species is P. Carica, the fig-tree, supposed to be a native of Asia Minor, but now found in all the southern countries in National Conference. minor, but now yound in all the southern countries in Europe. The fruit is termed a syconus (which sea), and is eaten green, and dried as a luxury in some countries, and as a common article of food in others. The finest dried figs are imported from Turkey, and are sold in bulk at prices varying from 20s. to 50s. per cwt. In consequence of their nutritive, emollient, damplearly and luxeling properties they are frequently. demulent, and laxative properties, they are frequently employed in medicine. The fig-tree is cultivated in Britain, but not extensively. It is only in very warm situations that it will ripen its fruit in the open air, even though trained against a wall. When grown in houses built on purpose for it, the fig-tree is remarka-bly prolific. This fruit-tree is the jeenah of the Bible.



BANYAN-TREE.

by the Hindoos. Its branches produce long shoots, or acrial roots, which descend to the ground and pene-trate the soil; so that, in course of time, a single tree becomes a vast umbrageous tent, supported by nu-merous columns. No fewer than 350 stems, each equaling in bulk the trunk of a large oak, and more than 3,000 smaller ones, have been counted in one example. The poet has thus described this marvel of the vegetable kingdom:—

" Branching so broad along, that in the ground The bending twigs take root; and daughters grow About the mother-tree; a pillar'd shade High over-arch'd, with echoing walks between. There oft the Indian berdsman, sbunning heat, Shelters in cool, and tends his pasturing herds At loopholes cut through thickest shade."

The fruit of the banyan is of a rich scarlet colour, and about the size of a cherry; it is eaten by the monkeys, which live with birds and enormous bats in the thick forest of branches. The bark is a powerful tonic, and is much used by the Hindoo physicians. The white glutinous juice of the tree is used to relieve toothache, as an application to the soles of the feet when inflamed, and for making birdlime. F. elastica, also a native of India, yields an inferior kind of caoutchouc, F. Sycamorus, the sycamore fig. is said to have yielded the wood from which mummy-cases were made.

FIDDLE. (See Violin.)

Fidnic Commissus, flate's kom-wis'-swis (Lat., committed to the trust), in the Roman law, denotes something given (usually by will) to one, in confidence that he will convey it or dispose of it for the good of another, The obligation was not created by words legally binding, but by words of request; as volo (I wish), peto The fruit of the banyan is of a rich scarlet colour, and

(I ask); and hence, originally, there was no legal means of enforcing its fulfilment till the time of Augustus, when a prestor was appointed whose sole business it was to see to the fide commissa. The person intrusted with the property was called fiducturing, and the person to whom it was intended to be conveyed, fidei commissarius. Fidei commissa were either particular or universal, the former being the bequest of a particular subject, the latter of the whole estate. They seem to have been introduced in order to evade some legal restriction, and to give the inheritance or a legacy. legal restriction, and to give the inheritance or a legacy to a person who was either incapacitated from taking it directly or who could not take as much as the donor the directly or who could not take as much as the donor wished to give. In some parts of the continent, as Germany and Holland, the fidei commissa form an important feature in the conveyance of heritable property, resembling our laws of entail (which see);—a person receiving the use of certain lands during his life, upon condition of transmitting them unimpaired, in a certain line, after his death.

Fig. (See Feudal Syrenm.)

FIELD, feeld (Ger. feld), in Agr., a portion of land inclosed by a fence, or rendered distinct by some line of separation, and set apart either for tillage or pas-ture. The term "field" was, in ancient times, applied ture. The term "field" was, in ancient since, approach in Britain to the lands under culture by the plough; its signification was consequently very comprehensive, as, until within the last two centuries, all land cultivated with the plough was suninclosed. Afterwards, when farmers portioned off and subdivided a part of the lands when farmers the inclosed nortions were called near the farmyard, the inclosed portions were called fields; the more distant portion, which remained open, was called open field or common field; while grass ands uninclosed were called commons. At the present day, in the improved state of agriculture, every farm is divided into fields, either by simple lines of de-marcation, which are sufficient when no animals are to be grazed on the farm, or by lines of separation which will act as fences; such as walls, hedges, ditches, &c. In all farms, every field has a distinguishing name. Without a regular fixed division of arable lands into fields, it would be next to impossible to conduct a rotation or succession of crops. When space is an object, and the grass lands of a farm are used for the grazing of them; of sheep, it is generally the custom to separate the fields by light netting, or hurdles, scarcely visible at a short distance. If this plan were more generally adopted with regard to the dividing-lines of fields, from a tenth to a fifth would be added to the contents of the greater number of corn farms. The same arrangement also saves considerably the first cost and the annual expense incurred, in order to plant hedges or build

expense incurred, in order to plant hedges or build walls, and in keeping them afterwards in repair.

FIELD ALLOWANCE, a daily amount of additional pay given to officers in the British army in consideration of the extra expenses entailed on them by reason of their service in the field. There are two different sorts of field allowances,—ordinary and extraordinary. The ordinary allowance ranges from £1. 10s. for a field officer to 1s. per diem for a subaltern: this is given for service when in camp at home and when on service in the colonies. Extraordinary allowance is only vice in the colonies. Extraordinary allowance is only allowed when troops are really in the field of action in actual warfare. No officer receives this unless present with the army in the field.

with the army in the field.

FILDFARE, feeld-fair (field and fare, from Sax.
faran, to go), (furdus piralis, Linn.), a migratory
bird, appearing among us about the beginning of
November and departing at the end of April. They
seldom breed in this country. It is about ten inches
in length, and of the following colours:—head, hind
neck, and wings, grey; fore part of the back, clestimit;
space before the eyes, brownish black; fore-neck and
breast, reddish yellow; over each eye a whitish line;
feathers tipped with a brownish triangular spot; those
of the sides with large dusky spots, and margined with of the sides with large dusky spots, and margined with white; lower wing-coverts and axillary feathers, pure white. In Poland, Russia, and Austria, it is found throughout the year. It builds its nest in lofty trees, and feeds on worms and various berries.

FIELD-GLASS, a species of telescope, used for the purpose of observing the movements of armies and operations during a military campaign. Further information respecting this instrument will be seen under the separate head of TRLESCOPE.

FIELD-MARSHAL, feeld-mer-shall (Ger. feld-merechall) the highest military rank that can be bestowed in the British army, and which is occasionally conferred on general officers for distinguished services in the field, and on princes of the blood royal in virtue of their position and connection with the sovereign. It is rather a title of honour in the British service than one rather a title of honour in the British service than one which implies any particular duty to be discharged by the holder, like those of commander-in-chief, general of division, general of brigade, &c. The title, in its present form, is copied from that of feld-mareshall in the Prussian and Austrian services, which was derived from the French term mareshal de camp, given to officers who performed, in former times, duties that were similar to some of those now discharged by the heads of the commissariat department and military train. The rank itself is of old standing. The supreme command of the English army was originally intrusted to a nobleman styled the lord marshal or each marshal of England; but when this office was made an hereditary appendage to the dukedom of Norfolk, it had sed to convey military rank, and marshals of the ceased to convey military rank, and marsnas of the army were appointed when occasion required. There arer at present (1862) seven officers of this rank in the British army: his majesty the king of the Belgians, Viscount Combermere, and Lord Seaton, who are field-marshals of some standing; and H.R.H. the duke of Cambridge, commander-in-chief; General Blake-ney, Lord Gough, and Lord Clyde, who were made field-marshals on Nov. 9th, 1862, when the Prince of Wales attained his majority. Wales attained his majority.

FIELD OFFICERS, in Mil., are such as are competent to command battalions,—as majors, colonels, and lieutenant-colonels; and the term is applied in contrast to those who can only take company duties, such as captains and lieutenants.

FIELD OF VIEW, in a telescope or microscope, means the space within which objects are visible when the focus of the instrument has been properly adjusted to

locus of the instrument has been properly adjusted to suit the sight of the person using it.

Field Spaniel.—This class of dog has very long hair in some parts; it is generally white, with large brown, liver-coloured, or black spots of irregular size and shape. The noze is sometimes cleft, and the ears



FIRLD SPANIEL.

are very long and pendulous, and covered with long hair like its body. The race of spaniel dogs was im-ported originally from Spain; whence their name. The field spaniel is used for shooting in field sports, like its congener, the setter.

FIRLD SPORTS are diversions in the field in pursuit of FIRLD SPORTS are diversions in the field in pursuit of game, &c.; as hunting, shooting, fishing, and coursing.
FIRLD TRAIN, a department of the Royal Artillery somewhat resembling the commissariat of an army. On it devolves the duty of the safe-custody of stores and ammunition, and the forwarding of the same to the base of operations in the field. A regular staff of men and commissariat is kept up in the field train for the purpose of these duties being satisfactorily performed. FIRID-WORES, military works thrown up by an army when hesisging a fortress or town; also those works erected by the besieged for the purposes of defence. Trenches, rife-pits, &c., like those constructed by our army in the Orimea, are instances of one class of field-works.

of field-works.

FIREDING COURTS, feet-ding, were certain petty courts established among early Gothic nations for the purpose of rendering speedy justice in small matters. They were so called because there were four of them established in each superior district or hundred.

FIREL FACIAS, field in fisiched dis (Lat., that you cause to be made; samally contracted fife), in Law, is a judicial writ of execution that lies where judgment is had for dish or damages recovered in the queen's courts. It is a command to the sheriff to levy the data and depresses on the goods and chattels of the debt and damages on the goods and chattels of the defendants, and takes its name from the words of the writ, quad fleri facius de bonis et catallis. This writ is to be sued out within a year and a day after judgment, or the judgment must be revived by a scire facias. This writ lies as well against privileged persons, peers, &c., as other common persons; and against executors and administrators with regard to the goods of a deeased person. The sheriff may not break open any outer doors to execute this writ, but must enter peaceably, and may then break open any inner doors to take the goods. And he may sell the goods and chattels of the party against whom the writ is issued, including agan his actuar for warm as the goods and considers of the party against whom are with it issued, including even his estate for years or his growing crops, until he has raised enough to satisfy the judgment. The sheriff, however, cannot lawfully sell off goods lying upon any premises demised to a tenant, unless the landlord be first paid his rent due before the execution, to the extent of one year's arrears, neither car he carry off, or sell for the purpose of being carried off any straw, hay, manure, or the like, from any lands let to farm, in any case where, by the covenants or agree prohibited between landlord and tenant. By 14 & 15 Vict. growing crops seized and sold in execution by Vict. growing crops seized and sold in execution by the sheriff are, nevertheless, liable for rent becoming due after such seisure and sale, so long as they remain on the lands. By 1 & 2 Vict. c. 110, money, bank-notes, bills of exchange, and other securities, may be taken under a writ of  $\beta_1 \rho_2$ . Under 8 & 9 Vict. c. 127, all personal goods and chattels can be taken, excepting wearing apparel to the value of £5. If the sheriff seize the goods of a stranger, he will be liable in damages. A  $\beta_1 \rho_2$  may be issued in chancery suits for the purpose of obtaining satisfaction of any neumany demand, under a decree or order of the suits for the purpose of obtaining satisfaction of any pecuniary demand, under a decree or order of the court. A flori fucias de bonis ecclesiasticis is a writiesned when the defendant is a beneficed clerk having a lay fee, and addressed to the bishop of the diocese, requiring him to attach the ecclesiastical goods and chattels of the defendant in satisfaction of the

FIRRY CROSS. (See CRANTABA.)
FIRA. (See FIRRI FACIAS.)
FIFA. (See FIRRI FACIAS.)
FIFE. fife (Fr. fifre), a wind instrument of music resembling a small flute in its form and method of performance, seldom having any keys, and never more than one. Fifes are of three kinds, called respectively A. B. and C. They are made from ten to sixteen inches in length, with or without a joint. The B files are the longer and lowest in tone, while those tuned to the key of C are the shortest and highest, and are to the key of the used: they have a compass of two octaves. When employed for military purposes, or open-air performance, the life is a very pretty as well as useful instrument; but its tone is too harsh and acute to be pleasant in chamber music.

acute to be pleasant in chamber music.

Fiftenery, ff-teenth' (Sax. fffyntha), was the name of a tribute, or imposition of money, anciently laid upon cities, boroughs, &c., throughout the realm. It was so called because it amounted to a fifteenth part of that which each city or town was valued at, or a fifteenth part of every man's personal estate, according to a reasonable valuation. This sum was first reduced to a certainty in the reign of Edward III., and long after, when the value of money had much changed, the amount to be paid by each town or parish as its fifteenth remained as then fixed.

Fifth (Sax. fifth), in Mus, a distance com-

prising four distonic intervals, that is, three tones and a half. It is the second of the consonences in the a half. It is the second of the consonances in the order of their generation. As consecutive fifths de not produce a good effect, they are not allowable in harmony. There are three kinds of fifths; viz., the perfect lifth (C—G), consisting of three whole tones and a semitone; the flat, diminished, or imperfect lifth (H—F), consisting of two whole tones and two semitones; and

the extreme sharp, or superfluous fifth (C—G sharp), composed of four whole tones.

FITTH-MONARHY MEN, fifth, the name of a sect of religious fanatios who appeared in England during the Protectorate of Oliver Cromwell, and whose distinguishing tenet was a belief in the speedy advent of a fifth monarchy (succeeding the four mentioned by Daniel,—the Assyrian, Persian, Grecian, and Roman), of which Christ was to be the head. In 1860, a few mouths after the Restoration, they broke out into a serious insurrection in London, under the leadership of one of the name of Venner, on which occasion many of them loat their lives, and others were afterwards executed. The sect noon afterwards became extinct. Fig. (See Ficus.)

Figaro, fig-a-ro, is a dramatic character, brought by Beaumarchais on the stage at Paris about 1785, in by Destinarchas on the stage at Taxis avoid 1755, in his two dramas, the Barbière de Seville and Mariage de-Figare. Since that time Mozart, Paesicilo, and Ros-sini have made the name celebrated in classic operas; and now the term is frequently used to denote an

adroit and cunning accomplice.

Figure, fig-ger (Fr. figure, Lat. figura), expressive of the form, shape, or distinguishing characteristics of anything as expressed by the outline or terminating extremities. In Arith, the term is applied to certain characters, by which any number which can be expressed by a combination of the nine digits and the cipher is denoted; as, 1, 2, 3, 4, 5, 6, 7, 8, 8, 0. These figures are called Arabio, on account, as it is surmised, of their being introduced into Europe by the Arabiaus. In Theol., the term figure is used to denote a type or symbol. In Geom., it is used in two different senses. symbol. In Geom., it is used in two different senses. In the first instance, it denotes, generally, a space-bounded an all sides, whether by lines or by planes; in the second sense, it signifies the representation (by drawing on paper or otherwise) of the object, or subject of a theorem or problem, in order to render the demonstration or solution to be more easily under-stood and followed: in this last sense, the word figure stood and followed: in this last sense, the word figure is analogous to diugram. All bodies are necessarily inclosed by one or more boundaries, and therefore possess figure; hence, figurability, or the quality of possessing figure, is termed one of the first essentials of matter. In painting, and art generally, figure is applied to the representation of living objects, as a statue or the form of man.

Figure in Rhat is defined to be in a contraction.

FIGURE, in Rhet., is defined to be, in general, "that income which is prompted either by the imagination or by the passions." Rhetoricians commonly divide them into two great classes,—figures of words and figures of thought; the words in the former case being employed in a sense different from their original and primitive meaning; in the latter the words are used in their proper and literal meaning, the figure consisting in the turn of thought; but the distinction is of no great use. One is apt to imagine, that as figures of speech always denote some departure from sim-plicity of expression, they are therefore artificial, are-of late growth. This, however, is by no means the case; for the earliest and least cultivated languages are generally those that abound most in figures. the very pancity of his language, and the want of proper expressions to convey his meaning, man, in his untutored state, is led to exercise his fancy, and express his ideas in image and metaphor. Hence, then, what is a necessity in the language of the savages is that which also gives beauty and grace to the polished languages of civilized life. Figures serve to enrich a language and render it more copious; and they also bestow a dignity upon style, by enabling us to avoid. the frequent use of common expressions to which the ear has been accustomed. More particularly, figures give us the pleasure of enjoying two objects presented together to our view without confusion,—the one signified by the figurative sense, which may be termed the principal object, and the one signified by the pro-

#### Figure-head

per sense, which may be termed accessory; the principal making a part of the thought, the accessory being merely ornamental. Lastly, figures possess a signal power of aggrandizing an object, giving frequently a much clearer and more striking view of the principal object than could have been the case if it had been expressed in simple terms and divested of its accessors idea.

sory ides.

RIGURE-HEAD, an ornamental figure or bast, emblematical of war, navigation, or commerce, &c., fixed on the top of the projecting portion of a ship's stem or

FIGURE OF THE EARTH. (See EARTH, GEODESY.)
FILARIA, fe-lai-re-ā (last. filum, a thread), a gen. of
parasitic entozos, common to large and small animals,
and infesting even certain of the mollusca. Of this family the most inimical to the comfort of man is the Guinea-worm (Filaria medinensis), which, in hot climates, insinuates itself under the skin of the lower members, causing excruciating pain. It has a slender and thread-like body, and sometimes attains a length of six feet. It is met only in certain portions of the torrid and temperate zones in Africa and Asia, and is

especially frequent on the African coast.

FILBERT. (See CONTLUS.)

FILB. 7ile (Sar. Feel), an implement used in many trades to produce a smooth surface on hard substances, as metals, ivory, or wood, &c. They are made of bars of steel rendered doubly hard by a process called *double* conversion, drawn the required size at the tilt-hammer, conversion, drawn the required size at the tilt-hammer, and then shaped, the square and flat ones by the hammer and common anvil only, but those of round, half-round, and three-angled forms, by means of bosses or dies made in the above shapes, which fit into a groove left for them in the anvil. The steel blanks having been thus formed, are next annealed, or softened, to render them capable of being cut, by placing a number of them together in a brick oven rendered air-tight by filling nu all the interstices with placing a number of them together in a brick oven rendered air-tight by filling up all the interstices with sand (to prevent oxidation of the steel, to which it is very liable if the air be admitted), and then making a fire play as equally as possible all round until they are red hot, when the heat is discontinued and the steel allowed to cool gradually before it is uncovered. The surface to contain the teeth is now rendered as smooth as possible by grinding or filing; the teeth are then cut with a carefully ground chisel, each incision being made separately. The next and last process,—that of made separately. The next and last process,—that of hardening, is performed in various ways by different makers; the ordinary method, however, is to cover the files with a kind of composition or protecting varnish, to prevent oridation and scalding of the steel when heated; they are then heated uniformly throughout, and lastly are plunged in cold fresh water to cool them as quickly as possible. A great number of extremely ingenious machines have been invented at various times to facilitate the process of file-making, but they have all proved more or less defective; however, notwithstanding this, it is very probable that many of the commoner kinds are out by machinery. Film (Lat. Alum, a thread), in Mil., the term applied to two soldiers standing one before the other,

or conjointly to any soldier in the front rank and the man who stands immediately behind him in the rear rank, when the company or regiment is drawn up in line. A body of soldiers is often spoken of as consisting of so many rank-and-file, which includes the corporals, lance-corporals, and privates, who stand in the ranks, the officers and sergeants having different posts ranks, the others and expense aring interest possessioned to them in front, on the flanks, or in the rear of the company, as occasion requires; thus, a company of 80 men, exclusive of officers and sergeants, would be spoken of as consisting of 80 rank-and-file, or 40 files.

FILE-MARCHING, in Mil., when a company is drawn up in line, and the order is given to face to the right or left and march in that direction. This method of marching is called file-marching. man and his rear rank man on his right or left, according to the direction in which the company has faced atill composes a file. (See File.) File-marching is a difficult movement for recruits, unless the leading file marches steadily, and takes the proper length of pace, and each file behind takes can to "look up," or keep closely in the rear of the file immediately before it, and those of others are mucilsginous. The rhisomes Men may be taught, the necessity of doing this when of marching is called file-marching. Each front rank man and his rear rank man on his right or left, accord-

### **Filices**

marching in file, by frequently viving the order "Front turn," and immediately halting the company, when the loss of distance between some of the files will become apparent. Men marching singly in a line, one after another, are said to be marching in single or Indian

FILIBUSTERS, fil-le-bus'-ters, is the name given to certain adventurers in America, and is derived from the French filbustiers, a corruption of the English freebooters or buccaneers. (See Buccaneers.) The filibusters have come into notice since the termination of the late war between the United States and Mexico, and exerted themselves with setting on foot, within the United States, military expeditions designed to operate in the Spanish-American countries to the south. The pretended object of these expeditions was the emancipation of those countries from tyranny, foreign or domestic, and the introduction of democratic institutions after the model of the United States; but their real object undoubtedly was their own aggrandizement, by re-enacting the part of the original Spanish con-querors. Though the setting on foot of such expedi-tions is contrary to the laws of the United States, jet, as they enjoyed a considerable degree of popular favour, no strenuous legal measures were adopted against them. The most noted expedition of this sort against them. The most noted expedition of this sort was that led by William Walker against Nicaragus in 1855, who succeeded in maintaining himself in that country for nearly two years; but was at length expelled by the union against him of the other Central American states. Walker was subsequently taken and shot at Truxillo, in Central America, in 1860, when engaged on another piratical expedition. ing is also a cant term much used of late years in the legislative assemblies of the United States to designate the employment of parliamentary taotics to defeat a measure, by raising frivolous questions of order, calls to the house, motions to adjourn, &c., in order to weary out the opposite party and to gain time.

Filices, file-seez, in Bot., the Fern fam., a nat. ord. of Acotyledones, sub-class Acrogenæ, consisting of

herbs with rhizomatous stems, and of arborescent pla The leaves, or fronds, as they are generally called, arise irregularly from the rhizome, or are placed in tufts upon the aper of the stem; they are almost always circinate in vernation, and are simple or compound. The fructification consists of little somewhat rounded cases inclosing spores. These cases are called sporangia, and are collected in heaps, usually on the under surface or at the margin of the fronds, or rarely on the upper surface, or occasionally in a spiked manner upon a simple or branched ruchis. The order rarely on the upper surface, or occasionally in a spiked manner upon a simple or branched rachis. The order is commonly divided into three sub-orders; namely, Polypodiece, Dancee. and Ophioglosece. Ferns are found in greater or less abundance in every part of the globe. In the northern hemisphere, they are herbaceous plants, but in the southern hemisphere, and in the tropics, they are sometimes arborescent, having stems occasionally fifty feet or more in height, and with the general habit of palms. There are about 210 genera and upwards of 2,000 species. Ferns are much cultivated in greenhouses

cultivated in greenhouses and closed glass cases (see WARDIAN CASE), and their graceful and tender green fronds now adorn thousands of English homes. The annexed[jllustration represents species of the two genera most commonly culti-vated; a being the Scolopendrium vulgare, or hart's tongue, and b a species of Polypodium, or polypody. Several ferns have farinsceous rhizomes or stems,



## Filigree

possess well-marked unthelmintic properties. The silky hairs found on the rhizomes and stalks of some species have been used for stuffing cushions and as mechanical styptics.

FILIGRER, OF FILLAGREE, fill-e-gre, fill-lit-gre FILIGERE, or FILLAGERE, Mu-spre, Mi-li-re (Lat. films, a thread, and graums, a grain), a delicate species of ornamental work in gold or allyer, wrought in little threads of the metal intertwisted in excentric forms and patterns. It is of eastern origin, and was first introduced into Europe by the Italians. In the East, India, Sumatra, and Java have been celebrated for the high excellence to which they have arrived in the prosecution of this art. When the gold or silver has arrived at a molten state, it is drawn into wire on an anyl, and then twisted. After twisting, it is hammered down again into a flat state, and formed into the shape of flowers and leaves. When the flignee is finished, it is cleaned by boiling in arrived in the prosecution of this art. When the gold water with common salt and alum, or occasionally limejuice. The Chinese often manufacture filigree jewelry, but which is not so elegant as that produced by the Malays. Filigree-work has an extensive sale on board the Peninsular and Oriental Steam-packet Company's vessels at Ceylon, where it is eagerly sought after by

vessels at Ceylon, where it is eagerly sought after by the European passengers.

FILLIBEC. (See KILT.)

FILLER, Mi-let (Lat. Mum, a thread), in Arch., the name given to a nurrow band, or flat ribbon-moulding, frequently used to divide mouldings of a curved form. It is a common feature in architectural designs, especially in entablatures. It is distinguished from the hand by being of narrow width and always flat. (See BAND.)

FILLY, fil'-le (Ang.-Nor.), a name applied to a young mare before it has reached its third year. For further information see article HORSE.

FILTER, fil'-ter (Fr. filtre), an apparatus by which fluids are separated from any solid matter held in suspension. They may be divided into four classes: those pension. They may be divided into four classes: those used in straining chemical liquids; those used for purifying water for household uses; those employed on a large scale by water-companies; and those used on shiphoard for changing salt water into fresh. Chemical filters are either used for rendering fluids transparent, or for the purpose of separating and washmical litters are either used for rendering fluids transparent, or for the purpose of separating and washing precipitates. They are usually made of unsized or blotting paper. (See Filtratrox.) Household filters for purifying water, either for drinking or culinary parposes, are made in various forms. In Paris, a large quantity of the river water is purified by passing it through boxes, at the bottom of which is a layer of charcoal between two layers of sand. Filtered river water, atthough not so agreeable to drink as spring water, is still well suited for other purposes. When water is filtered on a large scale by water-companies, the process is usually accomplished by means of filtering-beds. (See Waterworks.) The conversion of salt water into fresh is very important, and depends mainly upon distillation. There are many forms of apparatus for this purpose, and they are of great service on board ship, where the absence of fresh water often causes great misery. Dr. Normandy's method of converting salt water into fresh is largely adopted by the Admiralty and the large steamboat companies.

verting salt water into fresh is largely suppose by an Admiralty and the large steamboat companies.

FILTRATION, fl.trat.shun, in Chem., the separation of a liquid from any solid matter contained in it. It is generally effected by means of a filter formed of the corner of a round or square piece of filtering paper, shaded into four and placed on a funnel. When the folded into four and placed on a funnel. When the liquid to be filtered is corrosive, sand, powdered glass,

liquid to be flitered is corrosive, sand, powdered glass, or wisps of sabestos, are generally used. A piece of cotton wood, loosely plagged into the neck of a funnel, forms a very good extempore filter for ordinary purposes, and may be applied to culinary as well as to themical operations.

Fin, fin (Bax, fins), in Ichth., a flat expanded organ, projecting from the bodies of flahes, and used as an instrument of locomotion in the water. The fins of fishes are supported by elongated filsmentary bones or rays, by the number and nature of which the naturalist is able to distinguish the various groups. Many species of the whale tribe possess an immovable fin upon the back, composed merely of a reflexion of integument is anic to distinguish the same structure, but is derived. The great works of art now extant may be supposed to painting, soulpture, back, composed merely of a reflexion of integument engineering, and architecture, all of which appeal to over a mass of dense and ligamentous cellular mem—the eye, as the medium and interpreter of the pleasure brane. The tail in has the same structure, but is derived. The great works of art now extant may 040

#### Fine Arts

moved by the action of muscles upon the caudal vertebree, which are continued through the middle part. In works in ichthyology, a system of notation, founded upon the number of fin-rays, is employed. founded upon the number of fin-rays, is employed. Thus the number of fin-rays in the perch is expressed in the following manner:—D. 15, 1+13; P. 14; V. 1+5; A. 2+8; C. 17. This denotes that D., the dorsal fin, has in the first fin 15 rays, all spinous or bony; in the second fin, 1 spinous and 13 soft; P., the pectoral fin, has 14, all soft; V., the ventral fin, has 1 spinous and 5 soft; and C., the oaudal fin, 17 rays.

Finall, fin-a-le (Lat. finalis), the last portion of any act of an opera, or part of a concert. Finales are of different kinds. In instrumental music, they are commonly of a lively character and performance, combined with a quick movement; while in operas, they generally consist of a series of compositions for many voices, and are various in character, time, and move-

voices, and are various in character, time, and movement.

FINANCE, fe-nans' (Fr.), in Polit. Econ., is employed to denote the revenues of a king or state. (See Taxa-

TION, REVENUE, CUSTOMS, EXCISE, &c.) FINCHES, fin'-takes (SEX. finc), a fam. of birds belonging to the ord. Passeres, and the dir. Controstres, and known by the general name of finckes. According to known by the general name of finckes. According to Mr. Vigors, this family embraces, in addition the Alaudina, or larks, to which the buntings, or Embericina, seem nearly allied, the greater part of the Linnman Fringillida, with the Linnman Tanagrina (tanagers), which approach these in their external characters and in their habits. As far as has bitherto been ascertuined, none of the tinches are of large size, and in their habits and general appearance there is a strong likeness. For the most part they are hardy birds. Their food chiefly the most part they are hardy birds. Their food chiefly consists of grain, worms, and insects. The characteristics of this family of birds are,—beak straight, longer than deep, conic and pointed; mandibles nearly equal, cutting adges entire, forming a straight commissure; nostrils basal, lateral, oval, partly hidden by the frontal plumes; wings with the first quill-feather longer than the fifth, but a little shorter than the second or third, which are equal, and the longest in the wing; legs with the tarsi of moderate length; toes divided, and adapted for hopping and perching; claws curved and abarb.

FINDER OF GOODS, find or (Sax. findan, to find).—
The law on this subject is, that the finder of goods is to use all due means to discover the rightful owner; and if he keep and appropriate the articles to his own use, knowing the rightful owner, or without having made due exertion to find him out, he is held guilty of larceny. Fading the rightful owner, the goods become the property of him who finds them.

First, fine, in Law, is a pecuniary mulct or punishment imposed by a competent jurisdiction, and was so called because it was said finem facere de transgression.—to make an end of the transgression. The statute law has seldom determined the amount of fines to be inflicted for particular offences, and the common law never. They vary according to the aggravation or otherwise of the offence, the quality and condition of the parties, and numerous other circumstances. This the parties, and numerous other circumstances. This power, however, which is in the hands of the court, is far from being wholly arbitrary; for the Bill of Rights has particularly declared that excessive fines ought not to be imposed, nor cruel and unusual punishments inflicted; and the Magua Charta determines that no man shall have a larger smercement imposed upon him than his circumstances or personal estate will bear; saving to the landholder his contentment, or land; to the trader his merchandias, and to the country man. the trader his merchandise; and to the countryman his wainage, or toam and implements of husbandry. Hence it is never usual to inflict a larger fine than a man is able to pay without touching the implements of his livelihood; but instead thereof to inflict corporal

punishment or a limited imprisonment.

Five Aurs.—This term may be viewed as embracing all works which are executed by the mind and ingenuity of man. The phrase has of late, however, been restricted to a narrower and more technical significa-

## Fine of Lands

really be looked upon as models in their various lights of perfection, and they are chiefly composed of the relics of the ancient masters and classic art, consistrelice of the ancient missters and classic art, coesisting chiefly, as they do, of sculpture, the pictures of the old Italian school, the German, Dutch, and Flemish masters, and, it may be added, the works of Hogarth and Reynolds; all of which may be looked upon as different types of high art excellence. The schools of art which, in the present day, elevate the taste of the public, cannot be said to number more than three,—the English the Franch, and the latter lish, the French, and the German; and the latter, perhaps, for pre-eminence in correct and classic drawing, ought to bear away the palm. The school of Germany is not older than the present century, and yet, in purity and elevation of style, it holds a rank far auperior to that of France. This, perhaps, is owing to the fact of its being strictly guided by the old Italian rules of art in light and shade. This pre-eminence of Germany is not generally admitted, of course, by either the English or French schools; but there is no doubt as to the fact, and some of the best pictures of the French artist Ary Scheffer may be said to owe their excellence to the German schooling which that artist underwent. With regard to fine arts generally, England bears away the palm, as her excellence in painting (apart from classic rules), engraving, and architecture, can hardly be rivalled by other nations, although in the latter arranch she may be perhaps, a lish, the French, and the German; and the latter, architecture, can nardy be rivaled by other nations, although in the latter dranch ale may be, perhaps, a little weak. To sum up these remarks. The purity of design of the German school, and the variety and dexterity displayed in that of France, are qualities which the artists of this country would never like to deny; while, on the other hand, the Germans and French give praise to, and condescend to copy, the brilliant colouring and truth to nature which is always displayed by the English artists. To conclude in the displayed by the English artists. To conclude in the elegant language of Brando's Dictionary, "the fine arts are the offspring of genius,—their model na-ture, and their master tasto. Characterized by simplicity, they should never wander into luxury, nor degenerate into extravagance." (See Exhibitions, AŭT.)

Fine of Lands, in Law, is a name given to certain judicial proceedings which were formerly in common use in the conveyance of lands and hereditaments, but which have been abolished by 3 & 4 Will. IV. c. 73. Questions, however, regarding them will still occur, and the subject is thus one of present interest. It is defined to be "an amicable composition or agreement of a suit, either actual or fictitious, by leave of the king or his justices, whereby the lands in question became or were acknowledged to be the right of one of the parties." The party to whom the land was to be conor were acknowledged to be the right of one or one parties." The party to whom the land was to be conveyed or assured commenced an action or suit at law against the other, by suing out a writ of practice, called a writ of covenant, founded upon the breach of a supposed agreement or covenant that the one should convey the lands to the other. On this writ there was due to the lands to the other. posed agreement or covenant that the one should convey the lands to the other. On this writ there was due to the king, by ancient prerogative, a primer fine, amounting to about one-tenth of the annual value of the land. The suit being thus commenced, there followed the licentia concordand, or leave to compromise the suit, for which there was another fine due to the king, called the king's silver, or sometimes the post fine, equal to about three-twentieths of the annual value of the land. Then came the concord, or agreement itself, after leave obtained from the court, which was usually an acknowledgment from the deforciants (or those who kept the other out of possession) that the lands in question were the right of the complainant. From this acknowledgment, or recognition of right, the party levying the fine was called the cognizer, and he to whom it was levied the cognizer. The acknowledgment had to be made either openly in the court of Common Pleas, or before the lord chief justice of that court, or else before one of the judges of that court, or two or more commissioners in the country, empowered by a special authority, all of whom were bound, by stat. 18 Edward I. st. 4, to take care that the cognizors were of full age, sound memory, and out of the party levying the fine was called the cognizor, and he to whom it was levied the cognizor. The acknow-ledgment had to be made either openly in the court of Common Pleas, or before the lord chief justice of that court, or else before one of the judges of that court, or else before one of the judges of that court, or two or more commissioners in the country, empowered by a special authority, all of whom were bound, by stat. 18 Edward I, st. 4, to take care that the conjustors were of full age, sound memory, and out of prison. If there was a married woman among the cognizors, she was privately examined whether she captions, she was privately examined whether she captions, she was privately examined whether she that of substanties, while the comparative ends in sold freely and willingly, or by compulsion of her husband. By these acts all the essential parts of a fine genders, the seems being indicated either by distinct words or by epithets. The verbs have only two simple

## Finnish Language and Literature

of the writ of covenant and the concord, naming the parties, the parcels of land, and the agreement, and which had to be enrolled in the proper office. The foot of the fine, or conclusion of it, included the whole matter, reciting the parties, day, year, and place, and before whom it was acknowledged or levied. In order that the fine might have full effect, it required to be openly read and proclaimed in court. This mode of conveyance was so effective that it bound not only conveyance was so effective that it bound not only those who were parties to the fine, but all other persons whatsoever, unless they brought their action or sons whatsoever, unless they brought their action or made lawful entry within five years after proclamation made, except in the case of married women, infants, prisoners, persons beyond the seas, and such as were not of whole mind, to whom, or their heirs, five years were allowed after they recovered their legal powers.

FINGER-BOARD, fix'-ger-bord (Ang.-Sax.).—The whole of the keys, both black and white, of a pisnoforte or organ, are so called. That thin black board which extends over the necks of instruments of the violin hind on which during performance the atrings are

kind, on which, during performance, the strings are pressed by the fingers of the left hand, is also deno-

minated by this term.

FINGREING, fin'-ger-ing (Ang.-Sax.), the art of so disposing the fingers on any musical instrument, more especially on the pianoforte and organ, as to produce the required notes in an easy and graceful manner. A good method of fingering is of the utmost importance to the student, as without it the easiest passages will often appear difficult, and the difficult ones almost impracticable.

impracticable.

Finial, fin's-all (Lat. finis, end, termination), in Goth. Arch, the term by which the carred ornament which surmounts the top of pinnacles, canopies, mouldings, &c., is designated. It is generally in the form of foliage clustering round a knob or boss. The ornament called a poppy-head, frequently used to finish the upright sides of open pews in churches, is a finial.

Finings, fi-nings (Fr. raffiner, to purify), a term applied to those substances which are used for clarify-

ing or clearing, in brewing and other manufacturing operations. Some of these are made by the persons using them, and others are purchased by them from the manufacturers. Isinglass is made into finings by manuscurers. Isingless is made into finings by mixing it with beer or cider, which is then stirred till the isingless dissolves, when the mixture is strained through a sieve; it is then mixed with some of thesame beverage as that which is to be fined, until it is brought to a liquid state. Finings of this kind are much used by browners. A sieve and the liquid state is the liquid state. brewers. A mixture of alum with carbonate of

by brewers. A mixture of aium with earbonate of sods, or salts of tartar, dissolved in hot water, forms a fining much used by distillers and rectiflers.

FIFITE, fi-nite (Lat. finis, end), signifies having a limit, bounded. It is the opposite of infinite.

FINNISH LANGUAGE AND LITERATURE, fin-nich.—The language of Finland forms one of the chief branches of the Uralo-Altaic family, being, with the Esthonic and Lappish collaterals, kindred to the languages of the Urriane on Eastern Turks Ormani Turks Semoyalt. and Lappish collaterals, kindred to the languages of the Ugrians, or Kastern Turks, Osmanli Turks, Samoyeds, and other Tartars, Magyars, Mongols, and Tunguses, whose chief branch are the Mantchoos. All these constitute the so-called Scythic, or Turanian, or Allophylic family. The Finnish comprises a number of dialects, of which the principal are the lower, which is used along the coasts, its Abo variety being that which is used in books; and the upper, which is spoken in the inland regions, divided into the sub-dislects of Ulea and Viborg. It is written by Latin or German characters; but the letters b, c, d, f, g, occur only in a few foreign words, and g is now obsolete. It is, however, rich in vowel-sounds, having no fewer than eight, d and ö standing at the end of the alphabet. It has also many diphthongs, and, according to Rask, it is

#### Finnish Language and Literature

tenses,—the present and the past, the others being periphrastic. Their conjugation is complicated, their voices, moods, and other nice shades of meaning, being expressed by cartain syllables inserted between neing expressed by certain symmes inserted setween the root and the personal suffixes. There are no separate particles, and all their prepositions are placed at the end of the words to which they are re-lated. From the number of syllables thus brought lated. From the number of syllables thus brought together, some of the words are of great length (from eight to ten, and sometimes even as many as eighteen syllables); but in this way the most complicated ideas may often be expressed in one word, which would require several in most other languages. The construction is extremely free, without endangering the clearness of the sense. There can be little doubt, from the character and construction of the language, that this character and construction of the language, that this is not only one of the most ancient but one of the purest of the whole Asiatic-European family, being less mixed with foreign elements than the Hungarian, Turkish, or Mongolian. The literature of Finland is Turkish, or Mongolian. The intersture of Finland is particularly rich in popular songs or renses, which are sung by the runolainen, or song-men, to the sound of the favourite national instrument, the keatele, a species of harp with five wire strings. They may be divided into mythical and lyrical songs. These songs were handed down by oral tradition from generation to were handed down by oral fradition from generation to generation for many centuries, until at length, about the close of the 18th century, Professor Porthan, the Bishop Persy of Finland, made a collection of them, which was published at Abo. With the death of Porthan the subject went to sleep, until Dr. Topelins entered upon the same field, and published five volumes of ancient and modern popular songs, the last of which appeared in 1831, at Helsingfors. Topelins prepared the way for Dr. Rlias Lönnrot, the most enthusiastic and successful of all the collectors most enthusiastic and successful of all the collectors of old Finnish poetry. He was fortunate enough, in 1832 and the following year, to discover among the peasants of Karelen, and still farther on in Russia, a series of valuable poems, preserved by tradition, and comprising a mythical epic on the subject of the Finlandic Orpheus, the God of Song, Weinemöinen, his journeyings and adventures. He endeavoured, as far as possible, to present this eyele of songs in a connected of the present this eyele of songs in a connected of the connec epic form, and published them under the name of "Kilevala" (from Käleva, the great ancestor of all Finnish herces), at Helsingfors, in 1835. Alexander von Hum. bolds, in his Cosmos, in speaking of this work, says:
"Among the Finnish tribes who have settled far to the
west in the lowlands of Europe, Elias Lönnrot has
collected from the lips of the Karelians, and the country people of Olonets, a large number of Finnish songs, in which 'there breathes,' according to an expression of Jacob Grimm, 'an animated love of nature, rarely to be met with in any poetry but that of India An ancient egos, containing nearly three thousand verses, treats of a fight between the Fins and Laps, and the fate of a demigod named Vaino. It gives an interesting account of Finnish country life, especially in that portion of the work where Ilmarine, the wife of the smith, sends her flocks into the woods, and offers up prayers for their safety. Few races exhibit greater more remarkable differences in mental cultivation, and in the direction of their feelings, according as they e been determined by the degeneration of servitude have been determined by the degeneration of servitude, warlike fenocity, or a continual striving for political freedom, then the Fins, who have been so variously subdivided, although retaining kindred languages. In 1834, the Findlandie Society of Literature was established at Helsingfore, and has done much to spread a kinowledge of, and develop a taste for, this language. In 1841, it sent out Dr. Löunrot to travel. ahroughout the country, in order to collect ancient songs, and he was again very successful. The result of his labours he published the same year, under the name of Kantelstar, or Songs for the Harp, in three name of Kantelstar, or Songs for the Harp, in three volumes, containing no fewer than 652 ancient popular songs. In 1842, he published a collection of about 2,000 charades. In 1854, Radbäk published a collection of Finnish legends and tales. These published have given a great simulus to the study of the Finnish language; and while the upper classes still sling to the use of the Swedish, the peasantry welcome with avaidity every addition to the limited stock of their 842

# Fire-Brigade

printed literature. Newspapers and periodicals in their native tongue now circulate among them, and are eagerly read. The number of newspapers and periodicals published in Finland in 1858 was eighteen, of which cals published in Finland in 1858 was eighteen, of which eight were in Finnish and ten in Swedish. An interesting and valuable work is published annually, under the title of "Onr Country's Album;" and, though written in Swedish, contains translations of oppular songs, legends, sagus, &c., together with literary, philologic, and authetic papers, all bearing mpon the language, poetry, and history of Finland. The proces literature of the people is devoted almost exclusively to religious and moral subjects. A Finnish translation of the New Tastament anneared in 1548 translation of the New Testament appeared in 1548, and a portion of the Old Testament in 1552; but the whole Bible was not translated into Finnish till 1642. whole Bible was not translated into Finnish till 1642. The greatest living poet of Finland, and, indeed, the greatest among all that that country, in modern times, has produced, is Euneberg, who, though he writes in the Swedish language, is truly national and patriotic in spirit, and the genius of his country is the only muse that he acknowledges. The best grammar of the language is that of Jacob Juden, in Swedish (Viberg, 1818), and the best dictionary that of Lönarot, Helmington 1822. singfors, 1853.

Bingiors, 1893.

Fiord, or Fiord (fe'-ord), the Norwegian and Danish name applied to any bay, creek, or arm of the sea which extends inland. It is somewhat analogous to the Celtic long or lock.

Firs, fire (Sax. fyr), heat and light emanating visibly, perceptibly, and simultaneously, from any body. The terrific energy of fire, the most important agent of civilization, the similarity of its effects with that of the sun, its intimate connection with light, its terrible and yet genial power, and the beauty of its changeful fiame, easily account for the reverence in which it was held in easily account for the reverence in which it was not in ancient times. At a period when cause and effect, form and essence, were not distinctly separated, fire became an object of religious veneration, a distinguished element in mythology, an expressive symbol in poetry, and an important agent in the systems of cosmogony. It gained a place among the elements, and for a long time was believed to be a constituent part in the composition of all bodies, and to require only the concurrence of favourable circumstances to develop its activity. At a later period, fire, under the name of phlogiston, was considered to be the source of all chemical action. At the present day, the phenomena which were formerly ascribed to fire are attributed to the affects of heat.

the effects of heat. (See COMBUSTION, HEAT.)

FIRE AND SWORD, LETTERS OF, in the early law of
Scotland, were letters granted by the Scotch privy counoil against any one who refused to obey the decrees of a court, and were principally employed to disloge refractory tenants who refused to give up possession as re-quired by order of the judge. These letters authorized the sheriff to call for the assistance of the county, and dispossess him by all methods of force. The practice uspossess mu by an memous of force. The practice now is, where one opposes by violence the execution of a decree or any lawful diligence, which the civil magistrate is not able by himself or his officers to make good, to make application to the military for assistance, who enforce the execution manu military.

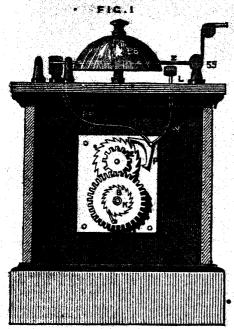
Fire-Annihilator. (See Annihilator, Fire.) Fire-Arms. (See Arms, Abrillery, &c.) Fire-dalls. (See Mutrors.)

(See Muthors.) FIRE-BALLE. (See DARROLE.)

FIRE AND BURGLAR ALARUM.—The fact that losses of both life and property from fire have of late been on the increase, serves to draw special attention to any practical contrivance for mitigating the evil by giving timely notice of any outbreak. Of such a nature is the self-acting fire-alarum and thief-detector which has been invented and patented by Mr. W. Gilbert, of Enfield. The apparatus is very simple in construction; it is self-acting, and does not involve the presence of an electric battery or other extraneous agent to insure its correct working. The invention refers to a peculiar application of a fusible wire or cord connected with the several rooms of a house, parts of a ship, or other place, and attached to an alarum in such a manner as piace, and attached to an alarma in such a maner as that, when acted upon by heat, it will be dissolved or melted, by which the train of wheels connected with the hammer and bell is liberated, and the alarm given. The following is one way in which the fusible wire or cord is prepared:—When a material is required,

## Fire and Burglar Alayum

capable of being fused at a low temperature, the proportions are—gutta-percha 18 parts, chloride of sulphur 2 parts, sulphures of antimony 8 parts, and copper bronne. I part, dissolved in chlorotom, naphtha, oil of tarpentine, or other solvent by gentle heat, afterwages submitted to a temperature of from 250° to 300° Fahr, for from two to seven hours, in a closed wessel, which compound will melt at from 96° to 120° Fahr, according to the tem-



F1C.2



THE AND BURGLES ALARUM.

men was placed under the command of a superintendent, each company paying so much towards the support of the whole. Mr. Braidwood, at that time the director of the fire-engines of Edinburgh, was invited to take the command of this new force, possiplate of lead 2 parts, esteined magnesis from 2 to 5 parts, gutta-percha 10 parts, escoutchood 10 parts, suphases of autmony 2 parts, and chloride of support of the strength of the protectives from fire depositions will fuse at from 130° to 200° Fahr., and is a conductor of feet, and not highle to be affected by moisture, gases, or time. It is made into the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between the form of a cord or vives by passing it between of the Linuidos Fire-brigade. The force of this latter consisted of between 30 and 40 large engines capable of throwing 88° gallons a minute to a height of from 885.

# Fire-Brigade

2 parts, bin 2 parts, and affirmary 1 part, melted together, is used. This will fuse at from 215° to 500° Pahr., by the omission of the mercury and bismuth. Fahr, by the omission of the mercury and binmath, more or less. In the accompanying engraving, fig. 1 is a front elevation of the apparatus, and fig. 2 is a plain or top riew. A (fig. 1) is an outer wood case placed in front, inclosing the alaram movement. At the centre of the apparatus two plates contain be-tween each other a pin (B), on which is attached a

ween each other a pin (B), on which is attached a spring, which is the prime mover of the wheel-gear, on which is fixed a ratchet-wheel (E), to enable the spring to be wound up similar to a chock spring, and a toothed wheel (S) having thirty-two divisions, which drives a parion, whose spindle passes through both holding-pastes, and carries the escapement-wheel (E) containing twenty-six divisions. P is a palate which regulates the motion of the escapement-wheel E, the introduces an excitation of which produces an excitation produce. the escapement-wheel E, the introvement of which produces an oscillating motion, which communicates movement to the wire W, furnished with a hammer, L. When the machine is in motion, the hammer L plays on the bell B. A wire (P) is fixed on the same spindle as the wire W at P, by which the hammer is held at rest by the lever H, which is held in a position to prevent the motion of the wire P, by a fusible wire or cord (Z) attached to the end of the lever H at a. The fusible wire or cord (Z) passes through the puller E where it is the end of the lever H as a. The lassible wire or cord (Z) passes through the pulley S, where it is carried forward through a unusber of rooms or spartments, being fixed in the same way as bell-wires are usually fixed, a constant strain being maintained on the fusible wire or cord by a string attached to the lever H at N; so that should the fusible wire or cord Z be acted upon by heat sufficient to melt it, a separation will take place and liberate the lever H, and the spring N will move it back as indicated at e.e. so as to allow the wire P P to oscillate, and the hammer L to play on the bell B until the spring is spant. By a simple arrangement, the apparatus is connected with doors or windows; and thus not only an outbreak of fire, but also any attempt at foreible entry, is at once indicated.—Ref. Mechanic's Mag., vol. iiv., New Series.

First-Bergars, an institution of men and fire-engines, fire-escapes, and so forth, under the com-mand of assperimendent, and supported principally by the fire insurance offices in London and else-where, for the purpose of being in a constant state of readings to warms. where, for the purpose of being in a constant state of readiness to preserve property and life from destruction by fire. This was the plan of organization until, in consequence of the London Firshrigade Bill, which come into operation on the lat of January, 1866, the brigade passed into the management of the Metropolitan Board of Works. Until the year 1825, all the fire insurance companies of London had distinct and separate establishments of fire-engines, &c.; but in that year the Union, the Sun, the Royal Exchange, the Atias, and the Phoniz companies joined their establishments of fire-engines together, and formed one association of fire-brigade. This association lested association or fire brigade. This association lasted until the year 1838, when it was found that it was not sufficient to conquer the devastating element which was constantly making raids on London. It was therefore determined, in 1833, to incorporate all the detached forces of engines belonging to the remaining fire-offices which had not joined the association; and this complete band of argines and men was placed under the command of a superin-

A. 中国的文化的基础和自由的对象的

by hand, and on In the year 1961 tended to several other streets and war contests, and continued froming for these says. The famous far. Breshwood, the intended superintends of the London Fern-breught subdishment, but his life by the falling of stine at the buildings, and the loss of property by this filestnesses occurrence was estimated at more this one million and a half of money. This is considered as the most serious fire since the Great Free of 1896, and Mr. Towns states in his work on "Fires and Fire-again." that the cost to the insurance sompanies for extra isbour in assisting to featurable progress of the flames amounted to 41,100. Besides fire-angular, all the offices are supplied with fire-assapes, ladders, and all norts of spare gear. On the ularm of free, by sjudicious code of rules, which the late fire Braidwood framed, each man knows the part he has to perform, and in about five minutes the generality of angines one be got ready and are tearing off to the scane of action. The complement of men to each engine is one angineer, four firement, and a driver; but these are generally increased in number. (See First-Braines.) The Kirs-brigade Bill of 1966 empowered the associated functureur offices to turn over their establishment to the Metropolitan Board of Works. The new system was to be maintained by a restriction of 210,000 ner anum from the governdriver; but these are senerally increased in anuber. (See Firs. Engars.) The Firs-brigade Bill of 1866 empowered the associated fusurance offices to turn over their establishment to the Mctopolitan Board of Works. The new system was to be maintained by a contribution of \$10,000 per assum from the government, a tax on the ratepayers of the metropolis, and a contribution from the insurance offices. It was also established under this act that the force of firemen should be under the command of an officer, to be called the whief officer of the metropolitan Firebrighde. The chief officer at the present time (Oct. 20, 1871) is Captain Eyre Massey Shaw, whose headquarters are in Washing Street. The whole of London is divided into four large districts, distinguished by the latters A, B, D, and D. The A district includes engine-catablishments in Westminster, Brompton, Fullam, Ecusington, St. John's Wood, Hampstand, Baker Street, Regent Street, and Highgate. In the B district fire-brigade establishments are formed in Farringdon Street, Edington, St. Lucks, Wathing Street, Chandes Street, E. Giler's, Holborn, and St. Pancras. The third, or C district, has firshinged establishments in Wellolous Square, Bethna Green, Heeliney, South Hackney, Stoke Newington, Mas End. Row, Retailff, Bishopagate, Shoreditch, De Beatroin Town, and Whitechapel. In the fourth, or D district, fire-brigade establishments in Wellouse Square, Bethna Green, Heeliney, South Hackney, Stoke Newington, Wandsworth, and Waterloo. The whole of this latter force is distributed on the scripts of the fourth, or D district, fire-brigade men stablishment in the Captar of the Part of the Street Rose, the day of the France In addition to the above district states that, taking waterly Review on this subject states that, taking waterly Review on the sure Thames at Millbank, of Southeast Review of Captain Shaw. That good effects have followed the establishment of the London Firebrights arm with the part of the propen years from Lee and the state of the subject of the

whole plant of the Royal Society for Protection of Life from Fire. In the same wear also a salvage corps, also makes the dissection of the Metacopolitan Roard of Torke, was reasonal. The England Science. A recent writer in the Paul Pleasant Science. A recent writer in the Paul Pleasant Science. The present Metropolitan Rise brigade had it, origin in 1833, by the union of ten insurance companies, emplanting the lengthcome spanish squirt', and the baselite obtained were so manifest, that before Blife the number of dre-offices subminising the Brigade and reached a total of thirty. In 1866 the Board of Works took over the plant and countral of the establishment; the offices giving up their apparatus and admignation grantificately, and also agreeding to pay, ander the new set, 256 annually upon every million of their manuscess. It is this reconstituted body, guided by the sable leadership of Captain Shaw, which day and angle, heavy watch on our behalf against the devouring alemant'; and a serious, unremitting, and gallant war they wage. In the vary interesting statistics of some thirty-three years which Captain Shaw has published, we been that the men of the Brigade were tenanoged to 20,000 conflagrations, of which nearly ten thousand resulted in serious damage; yet the remainder, sincteen thousand colours and odd, were kept by skill and courage within the limits of 'elight loss.' During that period, out of this defensive army twelve men were killed, but, considering the number of years covered by the report, that would seem a light list, if the amplementance of over-exertion or exposure that resulted shally in disablement. Thus it may be concluded that from forty to fifty London firemen annually ander death or injury of sell and including which they so constantly show, from their chief down to every member of the rank-and file, it must be confessed that the Metropolitan Fire-brigade is actually one of the most chivalrons bodies of modern times. British acception for remove the firm appears of the rank-and file, it is the quality chiefly wanted to make gold Remest, for, ironical as the maxim may appear, at a great conflagration the chief thing required is codessat. Your Parisian sapeur-pompier is apt to fine and gesticulate, and your New-Yorker to waste his utility in eaths and noise; but any one who has witnessed Captain Shaw and his "merry usen' getting to work must have admired the imperturbable insular style in which the 'enemy' is surveyed, comprehended, tackled, and subdised."

Transfers in Min a resistant of the complete of

subdued."

Firs-CLAY, in Min., a variety of day expeble of bearing a great heat without melting or visrifying. This arises from the absence of any alkaline earth to act as a flux. Stourpridge clay is one of the most famous, and is used largely in the manufacture of glass pots. It contains sixty-four per sent of siles, twenty-four of alumins; the rest being oxide of iron, water, and traces of carbonaceous matter.

First-pasty, a miner's term for the light carborested hydrogen of the coal-mines, from its inflaminability, in contradictinction to chake-damp, which challes or extinctibles flame.

extinguishes flame,

in contranscipcion to cana-caosa, which choices or extinguishes fame,

France Engine, a machine used for first artinguishing purposes, by means of which water is projected with more or less force, and from varying distances, apon the premises on firs. The applications of water is so evidently the readient and best method of neutroning the destructive agency of first, that from the carliest times the method of applying its the best advantage has been a matter of great importance. These methods vary greatly in detail, extending from the simple bucket or other reseal capable of containing water, to the completely equipped steam first-signs of the present day. The surfaces record of what would now be termed a first-sighted a found in the "Spiritalia" of Hern, she flowershed in Egypt in the second contury before Christ, and allows a machine with two sylinders provided with an air-reseal and worked by alternating lesses, input the principle of the modern manual engith. From headants incides in the work of Virenteen. Againstices, and Pliny we glean that ancient Bosse, as well as some of the pro-

vincial cities, was provided with the messes of preventing and extinguishing fires, including statements and extinguishing fires, including statements regularly trained firesies, engines, bushes, and other implements; but we have no information as to the design of these angines. Where reiners sells at fires are known to have been more at angioung in the beginning of the sixteenth century, and in 1857 Solutius gives a description of a fire-engine made by John Haussch, which he saw infed at Muremberg in the previous year, throwing a jet of water an inch in diameter to a binght of 30 feet. Flexible hore, without which the use of fire-engines is extremely limited, own first practically applied by the brothers Van der Heide in Amsterdam in 1872. This was made of lestber, in lengths of 80 feet, joined at the ends with metal couplings, said suchled the joined at the ends with metal couplings, said suchled the six of the fire. Plexible suction-less by which the pumpe draw water direct from the supply, instead of its being carried to the engine in beakets, was added by them a few years later. Previous to the fire of 1866, London was provided with hand syringes or squirts, each holding about three quarts, worked by three men, two of whom held the heatrument, raising and lowering it for alternate defining an argue and replenishment, while the third worked the piston backwards and forwards. These, with similar machines placed in reservoirs owness, and worked by a lever, were the only firethird worked the piston backwards and forwards. These, with similar machines placed in reservoirs on wheels, and worked by a lever, were the only freengines available fore arreating the progress of the great fire. The date of the first application of the air-vessel to the modern freengine, is uncertain, the previous to the use of which the water was propelled in broken streams, occurs in the "Journal des Strans" for the year 1875. The principles to be employed in the constructed for the fire-engine heigh now each inhed, subsequent improvements consisted eliefy in perfecting the various details in the best application of manual abour, to more the pistons, and in the arrangement of the carriage, whesis, and axis.

Improvements were carried out in Prawes, Leopold in Germany and the caption of the sightested castnywham in England; the last free-engine have been chiefy in the arrangement of the whole machine, so that the hose, suction-pipes, and necessary implement are, with the firement, carried in or upon the engine, the horse properties and the successful of the engines are constructed with a great water through the successful. These pumps draw water through a families of the successful of the surface, and which forms the framework of the sugine. The sirvessel is placed between the pumps and the outlets, one on each side, to which the leasther delivery-hose is attached. The pumps draw water through a families of the sugine. The sirvessel is placed between the pumps and the outlets, one on each side, to which the leasther delivery-hose is attached. The pumps draw water through a family of the suggestion of the earliest description of this most important addition, previous to the use of which the water was propelled in broken streams, occurs in the "Journal des Savans"

Pire-Repape

was secondished by fiband & Mason, who, in 1868, sometracted their first, this engine, after several public trials, was, in the same year, sent to St. Patersburg. In 1862 the Committee of the London Firston, in 1862 the Committee of the London Firston, in 1862 the Committee of the London Firston, in 1862, the second trial forms to the formstion, in 1860, of a committee of scientific and practical men, beaded by the Duke of Subscients, who offered seven headed by the Duke of Subscients, who offered seven headed pounds in July, 1863, the swards being as follows; to Shatid, Mason, & Co., of London, one prize of £500, and one of £100; Massrs. Merryweather & Bons et London, one prize of £500; Messrs. Lee & Laimed of New York, one prize of £100. The most retend of New York, one prize of £100. The most retend of New York, one prize of £100. The most retend of New York, one prize of £100. The most retend of New York, one prize of £100. The most retend of New York, one prize of £100. The most retend of New York, one prize of £100, Messrs. Merryweather & Gons, and Shand, Mason, & Go, both of London. The judges concluded their report by stating that, "whilst both sugines are good specimens of engineering, we are inclined, in accordance with the results indicated in the former part of this report, to give, after due consideration, our decided preference to Shand, Mason, & Co.'s engine. Capisia Shaw's report for 1869 shows that the Metropolitan Firsbriggle had then in use 2 floating and Mason, & Go. From this it will be seen that the external characteristics of the steam and manual fire-engines in its most approved form, as constructed by Shand, Maso

## Firefly

ation supported by public subscriptions, styled the Royal Society for the Preservation of Life from Fire. The following description of the Reseases employed by the society has been published by them: "The main ladder reaches from 30 to 35 feet, and can instantly be applied to meet second floor windows by means of the carriage lever. The upper hadder folds over the main ladder, and is reased easily into position by a rope attached to its lever-irons on either side of the main ladder; or, as recently adopted in one or two of the easipus, by as arrangement of pulleys in lisu of the lever-irons. The shore ladder for first floors fits in under the earnings, and is of the greatest service. Under the whole length of the main ladder is a canvas trough or bagging, made of stout sailcoth, protected by an outer trough of copper wire not leaving sufficient room between for the yielding of the canvas in a person's descent. The addition of the copper wire is a great improvement, as, although not tee canyles in a person's essecut. In a stantion of the copper wise in a great improvement, as, although not affording an entire protection against the canwas failing, it in most cases avails, and prevents the possibility of any one falling through. The soaking of the canves in alum and other solutions it also attended to; but this, while preventing its flaming, sannot remove the risk of secident from the fire charring the canvas. The available height of these escapes is about 45 feet, but some of them carry a short supplementary ledder which can be readily fixed at the top, and which in-creases the length to 50 teet." Although this form of ereases the length to 50 feet." Although this form of fire-escape has long been regarded as the best that could be used in a general way, the recent (Oct., 1871) disastrous occurrence, by which an heroic irreman lost his life through the burning of the canvas, whilst endeavouring to save the lives of others, proves that some improved and fire-proof form of material for the canvas shoot must be devised.

France, a name valgarly applied to those insects which have the power of emitting a luminous appearance from their bodies. (See GLOWWORK, &c.)

Figs., Grank.—The users of a composition of a highly combustible nature, said to have been invented about 670, by Callindon of Heliopolia, in the reign of Constantine III., emperor of the Rast, and used by the generals of that monarch with terrible effect against the files of the Saracens. The secret of its manufacture is now lost; but its chief ingredients are supposed to have been naphtha, pitch, and sulphur. It possessed the property of bursting into a raging flame on exposure to the sir, and could not be quenched by water. The only thing that would in any way counteract its destructive power was a mixture of vinegar, urine, and sand. It was attended with a disagreeable odour, and was hurled against the enemy from cross-bows, man-FIRE, GEREK. - The name of a composition of a highly

sand. It was attended with a disagreeable odour, and was hurled against the enemy from cross-bows, manonels, and other engines of was. The Greek fire was thrown thrice a day into the camp of the Crusaders when Aone was besieged by Richard L., casting the greatest amongance and injury to the Christian host.

FIRE CHARL BY. (See CROMAL.)

FIRE PLACE, in Build, the name given to the square opening that is left in the wall of a house for the reception of a stove or grate. It is formed in a shallow pier or abutment of masonry, which generally projects from the face of the wall into the apartment, having recesses on either side of it. The upright sides of the opening are called the jambs, and the head, which is usually in the form of a cambered arch, is termed the manutel. A broad flat stone is fixed immediately under the jambs, which, with another stone of distely under the jambs, which, with another stone of a similar kind, that is set directly in front of it, and on which the funder rests, is called the hearth; someon which the funder rests, is called the hearth; sometimes, however, the stone under the jambs is called the them, however, the stone under the jambs is called the think he had been as the subject of the stone under the jambs is called the sink, while the term hearth is applied to that which lies immediately in front of them. The wide square cavity inside the wall, and just above the fireplace, is gradually contracted in size half it becomes a small passage, which is termed the chimney, or flue. (See principle of the strength of the fireplace depends on the passage, which is termed the chimney, or flue. (See partments, to prevent the inconvenience likely to Flux.) This contraction is generally selled the size of the grate that its inches. In the will should be exposed to any great heat, gathering. The width of the fireplace depends on the inches. In the will should be exposed to any great heat, and wood as a non-conductor. No building eas remain in ordinary apartments, from 18 inches to 3 feet to interior, however well adopted it may be to resist fire aurroundable, the chimney-piece, consisting of pieces, or which great quantities of goods are stored, often frame. The vertical pieces are the state in the form of a frame. The vertical pieces are the state in the interior. This might be the firm the interior. This might be

## Fire-proof Buildings

support, is called the lintel. The lintel is surmounted by a broad shelf in the same material, called the manual-piece. The chimney-piece, whether in wood or marble, it frequently careed, and may be made a very bandsome and effective architectural feature in an instrile, it irrequency curves, and may be made a very handsome and effective architectural feature in an apartment. When chimneys were first introduced, the fire was kindled on the hearth, the fire! being supported on andirons, or fire-dogs, made of metal, and often chaborately ornamented. (See ANDIRON.) The opening above the hearth was long without say chimney-piece or ornamental dressing round it; while a projection, somewhat resembling a penthouse, or porch over a door, was brought forward from the wall of the spartment, directly over the fireplace, to act as a funnel, and to prevent the escape of the smoke into the apartment, to the discomfort of the inmakes. But when greater attention was paid to demestic architecture, the chimney-piece was introduced as an embellishment; and in massions built in the Elizabethan atyle, it consisted of a mass of carving and panels, which was generally carried up as far as the ceiling. The mantel-piece was introduced at a subsequent period, when the practice of adorning the wall shove the fireplace with carving was discontinued. It was at the fireplace with carving was discontinued. It was at first fixed at the height of five or six feet above the floor of the apartment, and was extremely narrow; in the present day it assumes the form of a broad thick slab. and projects considerably beyond the chimney-piece, being about 3 feet 9 inches, of four feet, above the surface of the hearth.—Ref. Nicholson's Architectural Dictionary.

FIRE POLICY. (See INSURANCE.)
FIRE-PROOF. (See FIRE-PROOFERG.)
FIRE-PROOF BUILDINGS.—To make a building entirely proof against the destructive action of five is manifestly impracticable; but the danger arising from fire may be obviated to a considerable extent by select-ing materials for building that are either incombustible ing materials for building that are etter incompositible or suffer less than others from the action of heat, and by paying proper attention to the construction of the building and the arrangement of the materials of which it is composed; that no wood-work, if timber be used in it, may be placed near enough to gas-pipes, or pipes communicating with heating apparatus, to be liable to ignition from explosion, or any other cause. All materials may be broadly classified as combustible All materials may be broadly classified as combustible and incombustible; including, under the former term, all kinds of wood, which fire will entirely consume; and under the latter, building stone, brick, cement, and though the action of heat may exert considerable influence upon them. Of the different kinds of wood in common use, oak, teak, and makogany, or any sort of hard wood, will not burn as rapidly and freely as deal. Of stones, some are more liable to injury from beat than others. Impactions and asset or remits will beat than others. heat than others; limestone, and even grante, will crack and fly to pieces if cold water be suddenly poured on them when in a heated state; but sandstone seems capable of offering more effectual resistance to the action of fire than limestone, and therefore better suited for fire-proof buildings. When iron is used for joists or girders, it must be remembered that it is liable to contraction and expansion under the influence of heat and cold, and that cast-iron beams will break if enddenly cooled by a jet of cold water when red-hot, if enddenly cooled by a jet of cold water when rad-hot, and that wrought-iron girders, in the same condition, are apt to give way under my endesive superincumbent weight. In constructing a fire-proof building, that is to say, a building in which an outbreak of fire will be attended with less destructive consequences to the building itself and the goods contained in it, than in one erected in the ordinary way, it is manifest that the use of combustible materials must be abandoned as much as possible, except for interior fittings, and to form himself and the superscript for interior fittings, and to form himself and the superscript for interior fittings, and to

#### Fire-proofing

counteracted, to a certain extent, by storing inflammable goods and materials liable to spontaneous combustion in small separate buildings, or in isolated compartments; care being taken, in their construction, to prevent the communication of the, breaking out in one part, to any other part of the building; for a large mass of fire in a building of great extent will do far more damage, in proportion to the building itself, than the heat arising from the burning of a small quantity of goods stored in a building of moderate size for reasons that are evident. To render an ordinary for reasons that are evident. To render an ordinary building, for commercial purposes, tolerably fire-proof, a stone staircase should be constructed, instead of one of wood, as the wooden staircase is too often the means of communicating the fire from floor to floor: the walls, also, should be of brick or stone of good quality; the joists, rafters, and roof of iron; and the floors composed of stone, slate, tiles, or bricks. In building rows of houses, at least nine inches of brick or stone should intervene between the ends of the joists let into the preserve of the side and considerate. into the party wall on either side, and openings for threplaces should always be arched with brick, as wooden bressummers in this position, and the ends of beams projecting into chimneys, have frequently proved the means of causing the destruction of many an old-

The means of causing the destruction or many an oldfishioned country mansion by fire.

Fire-proofing, the means of protecting plate,
money, papers, and documents of value, from the
action of fire, by the use of safes or fire-proof chambers,
and also of rendering woodwork and textile fabrics
capable of resisting its ravages. Iron boxes for the reception and safe-keeping of coin and papers have long been used; but when these were exposed to great heat, there was nothing to prevent the contents from becoming injured or consumed, if they consisted of books or parchment deeds. In 1834, a patent was taken out by a manufacturer of the name of Marr, for making safes capable of preserving anything placed within them from being damaged when the safe was surrounded by a fierce fire; and of late years the con struction of these iron repositories has been brought to great perfection by Chubb, Milner, Hobbs, and other makers. The general principle of making a fire-proof safe appears to consist in placing an inner case of iron inside an exterior framing of the same material, the intermediate space being filled with a composition that tends to prevent the heat from acting on the interior. The fire-resisting composition that is used consists of a variety of materials; such as powdered charcoal, sand bone-dust, gypsum, &c., used singly or in various com binations; and glass ressels containing some peculiar fluid ere sometimes added to the composition. The heat of a fire causes these glass vessels to crack; and the liquid contained in them is liberated and dispersed throughout the absorbent matter inserted between the inner and outer cases, and increases its capability of resisting fire. The iron of the exterior should be case-hardened, to guard against any attempt that may be made to force the safe open by drilling holes in it; and the lock should be so constructed as to be incapable of being blown open by the introduction of gunpowder. Every part should be made to fit closely and tightly together, especially the door, that no instrument may be inserted between its edge and the frame in which it fits, in order to force it open. The interior of the inner case should also be lined with some non-conducting matorial, such as the felt used for coating the interior of steam boilers. Since the introduction of fire-proof safes, they have been extensively used for the preservation of mercantile books and other documents; and testimonials have repeatedly appeared in the news and testimonials have repeatedly appeared in somewhat papers with reference to the effectiveness of their fire-resisting qualities, and the failure of every attempt made by burglars to force them open. An excellent method of rendering timber impervious to fire, is to over its surface with a solution of silicate of sods. When wood treated in this way is exposed to a figure to the solution of the solution of the solution. When wood treated in this way is exposed to a fierce flame, the heat draws the salt contained in the solution to the exterior of the timber, on which if forms a glazed coating, after having been nielted by the action of the fire. Muslins and all lines and cotton fabrics may be rendered fire-proof by dipping them in a solution of tungstate of sods. The greatsmert of this preparation is that the material which has been dipped in it may be washed and ironed repeatedly without deteriorating the

#### Firman

indestructible properties conferred on it by the tung indestructible properties conterged on It by the nung-state of soda; and it does not render the warp and woof brittle and rough to the touch, as tertile fabrics are which have been dipped in a solution of aitm or common satt, both of which substances possess quali-ties that will preserve linen and cotton goods from destruction by fire to a certain extent, but not so effectively. destruction by ure to a certain extent, but not so energitually as the tungstate of soda. It is cheap and easily applied, and its universal use would prevent many of the fatal accidents that so frequently happen from the ignition of light and inflammable fabrics. The solution of silicate of soda, mentioned above, should also be generally adopted as a wash for woodwork in houses, as generally adopted as a wash for woodwork in houses, as it effectually retards the action of the flames, which the resinous nature of the deal commonly used in build-ing is too liable to promote. The use of this prepara-tion would certainly prevent much of the destruction of life and property that arises from the rapidity with which fires invariably gain ground before effective them. First-Raising. (For Assow)

FIRE-BAISING. (See ARSON.)
FIRE-SHIPS, vessels filled with combustible matter to be sent against the shipping of an enemy lying at anchor in rivers or roadsteads, after having been set on fire in several places. They were frequently used during the wars of the last two centuries and the commencement of the present one, and often proved formidable engines of destruction. They are not so dangerous now, as one or two well-directed shots from one of the heavy guns now carried by ships of war would soon shatter to atoms any of the small craft that are generally used for the purpose. An attack with fire-ships was always made on a dark foggy night, which would allow of their being brought into close the state of the st proximity to the vessels it was desired to destroy. The wind and current being favourable, the helm of each was set in such a manner as to cause them to drift right against the enemy's ships when at anchor. When they had been brought as closely as possible to the doomed shipping, the crew lighted the fuses attached to the combustible matter on board, and took attached to the combustible matter on board, and took to their boats to get clear of the approaching explosion and conflagration. Formerly, ships were especially kept for this purpose in the British navy, but now it is a part of every gunner's duty to know how to fit out a fire-ship, if such a method of attack be contemplated. The fire-ships of the English did considerable damage to the Spanish Armada in 1888; and among other notable exploits with these destructive among other notable exploits with these destructive vessels may be mentioned the daring stack of the earl of Dundonald, then Lord Cochrane, on the French fleet lying at anchor in the Basque Roads, in 1809, which met with complete success, and that made by Sir Sidney Smith on the flotilla collected by Bonaparte for the invasion of England, off Boulogne, in 1804, which unfortunately proved a failure.

FIRE, ST. ANTHONY'S. (See ERYSIPRIAS.) FIRE-WORKS. (See PYROTECHNY.) FIRE-WORSHIPPERS. (See GUEBERS.)

FIRKIN, fir'-kin, a measure of capacity, which is equal to 9 ale-gallons, 7½ imperial gallons, or to 2,539 cubic inches.

FIRMAMENT, fir-mu-ment (Lat. firmamentum), was a term used in Ancient Astron. to signify the eighth heaven, or sphere in which the fixed stars were placed. It was called the eighth heaven because of the seven spheres of the planets which it surrounds. The firmument was supposed to have had two motions; one from east to west, round about the poles of the ecliptic, and east to west, round about the poles of the scliptic, and another and opposite motion from west to east. These revolutions it is said to complete in 25,412 years, or, according to Copernicus, in 268,600 years; at the end of which time the fixed stars return to the exact points that they occupied prior to their revolution. In the classies, the period was denominated the Platonic or great year. The word firmaneat usually designates the expansive arch over our heads, in which all the various phenomena of the stars and planets, appear to take uses. take place.

TREMAN, FERMAN, or FIRMAUN, fir-min' (Per., an order), is a word employed in Turkey to designate any decree issued by the Porte and authenticated by the sultan's own cipher or signet. Each of the ministers and members of the divan has the right of signing il mans relative to the business of his own department,

but only the grand vizier is authorised to place at their head the cipher containing the interlaced letters of the sultan's name, which alone gives them force. A decree signed by the sultan's own hand is called acti sherif. The name firman is also applied to a pasaport issued either by the Ports or a packs, enjoining the subordinate authorities to grant protection and sasistance to the traveller in whose favour it is granted. In

ance to the traveller in whose layour it is granted. In India, a written permission to trace is called a firman. FIRST-PRUITS (Lat. primitia) were the profits of every spiritual living for one year, claimed by the pope from all clerks appointed to benefices. In England this claim was first asserted in the reign of King John, and then only with regard to such clerks as the pope himself appointed to benefices; but subsequently they were demanded and taken by him from all clerks, by whomsoever appointed. By 26 Henry VIII. c. 3, the payment of first-fruits was transferred from the pope to the king, and their value fixed, as it is called, "in the king's books." Finally, Queen Anne gave up this branch of the royal revenue to the Church to form a perpetual fund for the augmentation of small livings. This is usually called Queen Anne's Bounty. and then only with regard to such clerks as the pope Bounty.

Fisc, or Fiscus, fisk, fis'-kus (Lat.), was the name given among the Romans to the private treasury of the sovereign, in opposition to the aversium, or public treasury; but afterwards, when the sovereign power became absolute, the two terms came to be synonymous. became absolute, the two terms came to be synonymous, and fiscus was applied generally to the property of the state. In Modern Law, on the continent of Europe, fiscus is applied to the public treasury, which is entitled to all fines, forfeited goods, goods without an owner, &c.; whence our term confiscation. The fiscus was entitled to many extensive privileges in civil as well as in criminal matters, and the term has come by degrees to be applied generally to the rights of the crown. In most of the German states there is an officer termed fiscal, who represents the government officer termed fiscal, who represents the government before the courts of justice, corresponding to the solicitor and attorney-general in Eugland.

Essal, fis-fell. pertaining to the public treasury or

(See Fiscus.) revenue.

Figs., fish (Sax. fisc), (Pisces), a name applied to animals exclusively aquatic, and occupying the fourth and lowest station of the section Vertebrata. The head is large, and set upon the neck without the intervention of any distinct neck; the body is usually of a spindle shape, tapering gradually towards the extremity; and the surface is usually smooth, without any irregularities which might impede the motion of the creature in its native element. In its general form, the body is usually rounded, or slightly compressed at the sides; sometimes this flattening proceeds to a much greater extent, so that the animal presents the appearance of a broad band, or oval disc, of which the edges correspond with the dorsal and ventral surfaces; in other cases, the flattening takes place from above downwards, producing a disc-like body, of which the upper and lower surfaces are dorsal and ventral. A fish may be shortly defined as an animal breathing through the medium of water, by means of gills; and in giving it our consideration, this latter apparatus is the most im-portant feature presented. It is situated on each side of the neck, and consists of numerous lamius fixed on arches. These lamine are covered with innumerable arches. These laming are covered with innumerable blood-vessels, and are so constructed as to present a considerable surface to the water, so that the blood may receive a sufficient portion of the exygen contained in that element. As the water in contact with the gills becomes deteriorated, it is necessary that a constant current be caused to flow over them. In most fishes this is effected by their taking water in at the mouth and expelling it at the gill-covers. The blood nance this is effected by their taking water in at the mouth and expelling it at the gill-covers. The blood, which is constantly sent from the gills to the heart, is distributed by means of the arteries to every part of the body, whence it returns to the heart by means of the veins. Animals of this order are for the most part furnished with an air-bladder in the interior of the body, which, as it is often connected with the oscillation of the property of the

and returns it into the veins, and the air which it incloses is probably derived from this fluid. By the dilation or compression of this sac, the specific gravity dilation or compression of this sac, the specific gravity of the fish is governed, and, acted on by a curious muscular apparatus, renders its possessor lighter or heavier than the surrounding element. The limbs of the fish are formed into fins; the fore-legs constituting what are termed the pectoral fins, and the posterior extremities, the ventral. Besides these, ordinary fishes are furnished with one or two dorsal fins, an anal fin, and a caudal fin, or tail. In some fishes, the dorsal or median fine are continuous round the whole posterior portion of the body; and this is the condition in which these organs first make their appearance, during the developor the body; and this is the condition in which these organs first make their appearance, during the development of the embryo in all fishes, the subsequent changes which fake piace in the arrangement of the parts being due to the unequal development of the bony rays, which support and stretch the membrane of which the fins are composed. The pectoral fin in all fishes consists of the same parts as the anterior limbs of any other vertebrated animal. Concealed within the skin, immediately helping the branchial companies is found a bright the branchial companies. distely behind the branchial openings, is found a bony circle, composed of several pieces, representing the shoulder-blade, with the coracoid bone and clavicle. This supports the bones of the arm, which are usually very short, and bear a series of carpal bones at their very snort, and pear a series of certai nones at their extremity; thellatter supporting a number of short cylindrical joints, whence the rays of the fin take their rise. The internal supports of the ventral fins never present such a close resemblance to the pelvis of the higher vertebrata as do those of the pectorals to the scapular arch. When situated in their normal position in the abdomen, they always consist of cartila-ginous or bony pieces, lying freely in the muscles, and quite unconnected with the vertebral column; but when the flus are advanced from this position to the neighbourhood of the pectorals, their internal supports are attached to the scapular arch of the latter members. The principal organ of motion is the caudal flu, or tail: by this it is propelled. The dorsal and rentral flus serve to balance it, and the pectorals to arrest its progress when required. The bones of fishes are of a less dense and compact nature than in the higher orders of animals, and always remain in an isolated state, similar to that of the embryo of the mammalia. The skeleton may be divided into four chief parts,the vertebral column, the head, the respiratory apparatus, and the limbs. The vertebral column consists of vertebre which are conose at each end and pierced in the middle; and, when joined together, the hollow space between each two is occupied by a gelatinous substance, which passes from one space to the next, through the hole in each bone. This hole is usually very small; but in some of the chondropterygians it is so large that the bodies of the vertebrae are mere To the vertebres are attached the ribs: in fact the ribs are the main support of all the other bones. The head varies more in form than in any other class of vertebrate animals. The same bones as those found in other oviparous animals are almost always traceable. other oviparous animals are almost always traceable. The upper jaw consists of maxillary and intermaxillary bones. In the greater number of fishes, the internaxillary bones constitute the chief portion of the upper jaw, the maxillary bones being placed behind and parallel to them. The lower jaw is composed, generally, of two bones on each side, the dental portion in front and the articular portion behind. The form of the body is for the most part such as mechanical printhe body is for the most part such as mechanical principles teach to be best adapted for moving with least resistance through a liquid medium. The surface of the body is either smooth and lubricous, or is covered by closely-imbricated scales, rarely defended by bony plates or roughened by hard tubercles, still more rarely armed with spines. The central axis of the nervous armed with spines. The central axis of the nervous system presents but one partial enlargement, and that of comparatively small size, at its interior extremity, forming the brain, which consists of a succession of ganglionic masses, most of them exclusively appropriated to the function of a nerve of special sense. The power of touch can be but feebly developed in fishes. The organ of taste is a very inconspicuous one; the which feeting the terms of the property of the terms of the state of the phagus by a tobe, must be regarded to secretain extent in the distribution of the framework supporting it, or the analogous to the lungs of the air-breathing vertebrats. This sac or air-bladder, however, has nothing to do lowing and breathing. Of the organ of hearing there is with respiration; it receives blood from the arteries, no ontward sign; but the essential part, the acoustic labyrinth, is present, and the semicircular canal, largely developed within the labyrinth, is without cochles, and is rarely provided with a special chamber, but is lodged, in common with the brain, in the cranial cavity. The eyes are usually large, but are seldom defended by eyelids, and never served by a lacrymal organ. The alimentary canal is commonly short and simple, with its divisions not always clearly marked, the short and wide quillet being hardly distinguishable from the stomach. The gancreas, for the most part, retains its primitive condition of separate caecal appendages to the duodenum. The heart consists essentially of one suricle and one ventricle, receiving the venous blood and propelling it to the gills; whence the circulation is continued over the entire body, in vessels only, which are aided by the contraction of the surrounding muscular fibres. The blood of fishes is red but cold, and is rarely elevated above the temperature of the surrounding element. The sexes of fishes, excepting the sharks and rays, offer no very decided external characters by which they may be distinguished. The respiratory organs, however, occupy more space in the males than in the females; and, on the other hand, the abdomen is larger in the females than in the males. The fecundity of fish is very wonderful, as the following table will show:—

Pisu.	Weight.		Weight of Spawn.	No. of Eggs.
Carp Codfish Flounders Herrings Mackerel Perch Pike Roach Smelt Sole Tench Lobster	oz. 25 24 5 19 8 56 10 2 14 40	dr. 5 4 10 0 9 4 64 0 8	2,571 12,540 2,200 480 1,223\(\frac{1}{2}\) 766\(\frac{1}{2}\) 5,1(0\(\frac{1}{2}\) 361 149\(\frac{1}{2}\) 642\(\frac{1}{2}\)	205,109 3,636,760 1,357,400 36,960 546,681 28,323 49,304 81,556 38,278 100,362 383,252 21,699

The salmon is far more productive than any of these; the ovarium of one female salmon will produce 20,000,000 eggs.—Ref. English Encyclopædia, Dallas, and the works of Jesse, Owen, Yarrell.

Fisheries, a term applied to various stations and

Fightheries, a term applied to various stations and localities around our own coasts and those of other nations, where the different shoals of fish used by man for food are to be found at certain seasons of the year; and where the business of catching or entrapping the selfsame fish is carried on by fishermen, an exclusive class devoted to the occupation. Fisheries or fishing-grounds have been often the subject of disputes and embroilments between different governments, and sometimes even treaties have been effected in their especial right; to instance which, it may be mentioned that a convention was signed at Paris on the 2nd of August, 1839, between France and England, to fit the limits of the oyster and other fisheries which approximated the coasts of the two nations. Fisheries are of the greatest importance to nations, and especially to England, whose extent is insular, and bounded on every side by the sea; because fish forms one of the articles of principal consumption as food, and is also an article of exchangeable nature with other nations in the path of commerce. The principal kinds of fish which have separate fisheries are whales, cod, ling, lake, herring, looksters, mackerel, oysters, pilchards, salmon, anchovies, sardines, sturgeons, and tunny. In this country our fishermen are in the habit of fishing for all thear, with the exception of the last four species; and each kind of fishery may be termed a separate instance of our national industry. The Br ish fisheries are carried on in various parts of our dominions. Whales are principally caught along the shores of Greenland, in Davis' Straits, and the South Seas, as well as near the southern portions of Australia and the Cape of Good Hope. With regard to those fisheries which are carried on infore closely to our own shores, that of the kerring, on the coasts of Scotland and along the British Channel, must be especially no-

ticed. The Caithness fishery is the most prosperous and remunerative of the Scotch fisheries, and the town of Wick may be said to be the centre of the therring fishery in that part. The average yield per boat engaged in fishing is about 100 crass, a cran measuring 45 gallons of ungutted herrings. The herring fishery commences in the month of May off the eastern side of Lewis, and continues into the month of June, or midsummer. It then spreads along the eastern or midsummer. It then spreads along the eastern and western shores of Scotland, reaching Caithness by August. During the autumn the shoals are off Yarmouth, and there continue during a portion of the winter, by which time they commence to work their way up to Lewis once more, where they reappear again in the spring. The herring is fished for by driftnets, which are composed of several lengths, and by trawl nets; the latter, however, are the most useful. The Irish herring fisheries are not so productive as the Scotch, but they are yearly stimulated by public grants of money for their furtherance; and the same may be said of all other species of fisheries in Ireland; this is owing not so much to their support. this is owing not so much to their unprofitableness as to lack of industry in their prosecution. The pilchard fishery is carried on along the coasts of Cornwall and Devon, and is of great importance in the trade. The pilchard is caught in the months of August, September, November, and December, and is salted and packed for exportation. The quantity of the pilchards exported by us to the Mediterranean and other foreign markets is about 30,000 hogsheads per annum. markets is about 30,000 hogsheads per annum. The salmon fishery is carried on chiefly on the rivers and estuaries of Scotland and Ireland. Aberdeen in Scotland, and Cork in Ireland, are the chief salmon stations, from whence the fish is sent to various parts of the kingdom. (For a description of the salmon, see article under that heading.) The cod, ling, and hake fisheries are carried on along Scotland and Ireland, and about the banks of Newfoundland. These fisheries themselves may be said to date their origin fisheries themselves may be said to date their origin from the discovery of the Portuguese, in the year 1500, and they are the sole support of the dwellers in that unproductive land. The quantity of cod, ling, and hake cured and exported from Scotland and the Isle of Man in the year 1854 was 109,684 cwt. cured dried, 6,166 cwt. cured in pickle, and 19,557 cwt. exported, which were of dry cure. The mackerel and other minor fisheries are carried on along our own coasts, and do not need separate mention. The shell-fish which are so much consumed by us are found in the Channel islands and about the English Channel. (For whalefishery, see descriptive article on the whale.) A rough estimate of the total value of the foreign and domestic fisheries of Great Britain would give a sum of about £6,000,000 per annum, although they have indeed been stated to be worth £8,300,000 annually. FISHING. (See ANGLING.)

FISHING. (See ANGLING.)
FISHINGS. (See ANGLING.)
FISHINGSTEES, fis-se-roy-treez (Lat. findo, I cleave;
rostrum, a beak), the name of a tribe of birds, consisting of the swallows, swifts, and gostsuckers. They
are distinguished by having the bill short, broad,
depressed, slightly curved, without any tooth, and so
deeply cleft as to give pecuhar wideness to the gape;
a structure of great use to birds which prey so exclusively on insects taken on the wing. On account of
the food on which they subsist, all the fissirostres migrate from northern countries towards the close of
autumn, and return again in spring. Like the raptorial order, or birds of prey properly so called, the
fissirostral tribe is capable of a binary division into
diurnal and nocturnal species.

Fistula, fis-tu-li (Lat., a pipe or reed), in Surg., is a long and sinuous ulcer, having a narrow opening, sometimes leading to a larger easity, and which has no disposition to beal. The most common form of this disease is the fistula in ano, the sinus extending into the cellular substance about the snue, or into the rectum itself. It is the result of abecesses formed in the cellular tissue around the rectum, and which having burst or been opened, are prevented from healing by the action and irritation of the sphincter ani. They are divided into two kinds,—complete and incomplete, or blind; the former having two openings or outlets, the one externally, the other into the rectum; the latter having only one, and being divided into blind external, according as the

opening is external or internal. This disease is commonly attended with intense pain, especially when passing the fæces, and there is an irregular discharge of purulent matter, which is sometimes mixed with blood. The treatment consists in making a complete cuoca. The treatment consists in making a complete division with the knife of the whole of the parts between the fistule and the bowel, and the edges of the wound are kept spart by lint, in order to allow the cavity to fill up by granulation. A fistule lacrymalis is a disease of the lacrymal sac, caused by an obstruction to the flow of tears along the nasal duct. The symptoms of this disease are a watering of the are with a dwyness. this disease are a watering of the eye, with a dryness of the corresponding nostril, a distension of the lacrymal sac, and a discharge of muco-purulent fluid mixed with tears, from the puncts lacrymalis, when the sac is compressed. In the earlier stage of this disease, when there is only a distended state of the lacrymal sac, a cure may be effected by the application of leeches and fomentations to the eye, with the use of astringent ointments to the edges of the lid. In the more advanced stages, however, where there is inflammation and suppuration of the sac, or where a fistulous opening has been formed in it, by the escape of purulent matter, an operation becomes necessary for its removal. is effected by making an incision with a sharp-pointed knife into the lacrymal sac, and then passing a probe downwards into the nasal duct; after which a silver instrument called a style is inserted, and allowed to remain until the inflammation, which produced or accompanied the abscess has subsided. Salivary fistula is a fistulous aperture in one of the salivary ducts, opening externally, and through which the salivary escapes. It is generally caused by a wound, which, if recent, a cure may be effected by merely bringing together and uniting the edges of the wound; but if of some standing, a free canal ought to be formed for the discharge of the saliva into the mouth. In fielula in peringo, which is almost always accompanied with a stricture of the urinary passage, the fluid passing out stricture of the urinsry pussage, are mine passage out of the external opening of the sinus, an operation is necessary, which will require the aid of a competent surgeon. Fistules generally require very skilful treatment, and are often extremely difficult to close; and though not in themselves dangerous, they are not unfrequently attended with fatal results, arising out of the constitutional depression, which they occasion by the long-continued wearing pains, and the drain upon the system, in consequence of the protracted discharge. Fistula in ano is often observed in consumptive patients.

Fixtula in ano acolten observed in consumptive patients.

Fitz, fits (old Nor.), signifying son, and evidently a corruption of the Latin filius. It is prefixed to proper names, like the Scotch Mac, the Irish O, and the oriental Ben, to signify descent; as in the names Fitzwaller, Fitzwilliam, Fitzherbert. It has also been employed in recent times to denote the natural sons of the property of the kings and princes; as in Fitzroy, Fitzjames, Fitzclarence.

FIVE POINTS, THE, in Theol., are the five principal points of controversy between the Calvinists and Arminians. (See CALVINISM.)

FIXED AIR, fiked (Fr. fixer, to fix), in Chem., an old term for carbonic acid gas.

FIXED OILS. (See OILS.)

FIXED STARS, the common name given to all stars in the heavens, with the exception of the planets. They are so called because they appear to us to be stationary in the broad field of the heavens, having no apparent motion, and always preserving the same relative position with regard to each other. They are supposed to be the centres or suns of other systems, similar to our n. Sirius, the dog-star, in the constellation Canis Major, which is the brightest of all the stars, is considered to be nearer the earth than any other; and the distance of this from our planet is computed to be not less than nineteen millions of millions of miles. The fixed stars have been grouped into separate clusters called constellations, and divided into six classes accance conscensions, and divided into six classes according to their respective apparent magnitudes, the largest and brightest being called stars of the first magnitude, those that are next in size and lustre stars of the sixth magnitude are the smallest that are visible without the aid of a telescope.

the light. The principal fixing agents are hyposulphite of sods, which may be used either for glass or paper pictures, and cyanide of potassium, which can only be used for the former. (See PHOTOGRAPHY.)

FIXTURES, fike tures, in Law, are things annexed to houses or lands, which become, immediately on annexasame laws as apply to heritable property. The question as to what are or are not fixtures is of some importance, as determining the rights of landlord and tenant, heir and executor, &c. Fixtures in general are personal chattels let into the earth, or cemented or otherwise fixed to some erection previously attached to the ground, and are thus legally immovable. If they the entirely clear of the soil, they are not fixtures, and may be carried off at pleasure. Hence a tenant may construct erections,—even barns, sheds, and the like, upon blocks, rollers, pillars, or plates, so that they shall not be deemed fixtures but remain movable charten. tels. The general rule is, that whenever a tenant has affixed anything to the premises during his term, he cannot again sever it without the landlord's consent. To this rule, however, various exceptions have been made in favour of what are termed trade fixtures. A tenant may safely remove such things as he has fixed to the freshold for purposes of trade or manufacture, provided the removal cause no material injury to the As regards agricultural fixtures, it is provided by 14 & 15 Vict. c. 25, that if any tenant of a farm or lands shall, with the consent in writing of the landlord for the time being, at his own cost erect any farm-buildings, either detached or otherwise, or put up any buildings, either detached or otherwise, or put up any other building, engine, or machinery, either for agricultural purposes or for the purposes of trade and agriculture (which shall not have been put up in pursuance of some obligation in that behalf), then all such building, engines, and machinery shall be the property of the tenant, and shall be removable by him, notwithstanding that the same, or any part thereof, may be built in or permanently fixed to the soil; so as the tenant, in making such removal, do not in anywise injure the land or buildings belonging to the landlord, or otherwise do put the same in like condition as they were in before the erection of anything so removed. But the tenant, before making any such removal, must give the landlord or his agent one month's previous notice in writing of his intention to do so; and if the landlord or his agent elect to purchase the things proposed to be removed, then the tenant's right to remove the same shall coase, and the value of the things shall be ascertained by two referees, one to be chosen by each party, or by an umpire to be named by such referees, and shall be paid or allowed in account by the laudlord who shall have so elected to purchase. Another exception to the general rule is in favour of such fixtures as are put up for ornament or domestic use, as hangings, stoves, &c.; but not such as have become part of the tenement, and constitute permanent improvements. The distinction, however, is often very nice, and it is difficult to define it in general terms.—Ref. Amos and Ferand On Fixtures.

FLACOURTIACEE, flá-koor-te-ni'-se-e, named after M. de Flacourt, a director of the French East-India Company, in Bot., a synonyme for Bixaceæ (which

see).

FLIG, Adg (Sax. fleegan, to wave in the air), the name given to pieces of cloth, or bunting, of various colours, and often bearing various devices, that are hoisted in conspicuous places on poles or at the masthead of vessels, and allowed to float on the breeze for different purposes. The primary object of a flag is to denote nationality, and it is more especially used for this purpose at sea, to allow commanders of vessels to this purpose at sea, to allow commanders of vessels to show others to what country their ship belongs. The use of fiags is probably of very early date, families and tribes, as well as nations, being distinguished, in the early ages of the world, by emblems embroidered on a small source banner. We are told in Numbers ii., small square banner. We are told in Numbers in that in the wanderings of the Israelites in the wilder nitude, those that are next in size and lustre stars of ness, they were ordered to pitch every man "by his own standard, with the ensign of his father's house;" magnitude are the smallest that are visible without the sid of a telescope.

Fixing, in Phot, a term applied to the cleaning of photographs from the sensitive layer not acted on by 850

Flake-white

adopted a green standard, which, with the addition of a creacent, is still the national flag of Turkey; and about the same period, the white horse of the Saxons, perpetuated in the armorial bearings of Hanover, and the black rayen of the Danes, were well-known ensigns that floated over many a battle-field on English soil. The ustional flags borne by the principal nations of the world at the present time will be found in the plate of "Flags of Ail Nations," in vol. I. of this work. Of the flags peculiar to Great Britain, the principal is the Royal standard, consisting of the armorial bearings of England, Scotland, and Ireland combined, which is England, Scotland, and Ireland combined, which is hoisted wherever her Majesty happens to be residing; or on vessels, when the queen or any of the royal family is on board. The Admiralty flag consists of a gold anchor borne on a red field; and the national flag, known as the Union Jack, consists of the red cross of St. George, and the red and white saltires of St. Patrick and St. Andrew, combined, on a blue field. The ship in which the admiral of the fleet happens to be always carries the union jack. When this flag is hoisted by a merchant ship, it is distinguished by having a white border round it, and is then called a merchant jack. There are also three other flags, which are used to distinguish admirals of different ranks in the navy, known as the red, white, and blue which are used to distinguish admirals of different ranks in the navy, known as the red, white, and blue ensigns. The red, or British ensign, is a red flag with the union jack in the upper corner of the end attached to the haulyards; the white ensign is a white flag with a red cross; and the blue ensign a blue flag, both having the union jack in the same position that it occupies in the red ensign. The grade of an admiral is further distinguished by the must at which be carries his there a full admiral of the rad white, or blue, hearing his flag; a full admiral of the red, white, or blue, bearing his flag at the main-mast, a vice-admiral at the fore-mast, and a rear-admiral at the mizen-mast. Flags of various shapes and colours are used as signals for various shapes and colours are used as signals for communication in the royal navy and British mer-chant service, a new code of signals having been lately introduced to superseile that invented by Captain Marryatt, the well-known novelist. Different signifi-cutions are also attached to plain flags of one simple colour; thus, a yellow flag indicates that there is sickness of a dangerous character on board the vessel which bears it, or that the ship is performing quarantine; a white flag is well known among all nations as a flag of truce, and betokens a desire for a temporary cessation of hostilities, for the purpose of communica-tion between hostile parties, or for burying the dead slain in battle; a black flag, on the other hand, is the emblem of piracy, or betokens a determination, on the part of those who hoist it, to resist to the last, and to give or taken no quarter. When a flag is hoisted half-mast high, it is a mark of mourning: when it is hoisted upside down, it forms a signal of distress. A blue flag, with a source white covers a signal of distress. with a square white centre, called the blue-Peter, is hoisted when a vessel is about to sail, and is the signal of departure. A short triangular flag is called a burgee; a longer flag, of the same shape, a signal pendant; a square flag, with a triangular piece cut out of the end furthest from the haulvards, with the point turned towards the centre, a cornet; and a very long narrow flag, resembling a strip of ribbon tapering to a point, which is borne at the mast-head, is called a pendant.

FLAG, in Bot., a general term for a number of endo-genous plants whose leaves are sword-shaped. (See Acores and Ints.)

FLAGELLANTS, füğ-el'-lânts (Lat. flagellare, to beat), the name of a sect of religious fanatics that sprang up in Italy about the year 1260. They were so called from the flagellations or whippings which they administered to themselves, the leading doctrine of their creed being that by mortifying the flesh in every conceivable manner they propitiated the wrath and gained the favour of the Deity. Sects or bodies of persons holding this doctrine, and practising whipping and other mortifications of the flesh, had appeared at various times in the earlier history of the Charch; but this was the first occasion on which they made a prominent figure. People were no longer satisfied to perform these acts in private, but took to practising them in public, by way of greater humiliation. They FLAGELLANTS, finj-el'-lants (Lat. flagellare, to beat), them in public, by way of greater humiliation. They formed themselves into large bands or companies, and went about from place to place, carrying banners and

crosses, singing penitential hymns and whipping themselves until the blood flowed. In 1201 they passed into Germany, and there made many converts; but on account of their irregularities and disorderly proceedsings, a general outory was raised against them, and they were at length put down. The second great out-break of this manis took place after 1343, when that terrible scourge the black death had swept over Europe and carried off so many persons. The imaginations terrible scourge the black death had swept over Europe and carried off so many persons. The imaginations of the people, already excited by the pestilence, were ready to seize upon this superstition, which spread rapidly through Germany, Switzerland, Holland, Sweden, and even England. The scenes of the previous century were re-enacted with even greater excesses than before. Men and women indiscriminately now armaged in public halfonked, and nuderwent these than before. Men and women indiscriminately now appeared in public helifonked, and underwent these self-indicted acorgings. They held that flagellation was of equal virtue with baptism and the Lord's Supper; that forgiveness of sins was to be procured by it without the blood of Christ; that the law of Christ was soon to be abolished; and that a new law, enjoining a baptism of blood, to be administered by whiting was to take its when. They were condemned whipping, was to take its place. They were condemned by a bull of Clement VI., and other severities were practised against them, until at length they disappear. Again, in the year 1414, a new troop of these fanatics make appearance in Germany, under the leadership of one Conrad Schmidt. They were even more with in their extravagances than their predecessors, rejecting all forms of worship, and holding that faith and flagellation were alone necessary to salvation. They were everywhere persecuted, and many of them were burnt as heretics; among whom was their leader Schmidt; but it was with difficulty that their system

was at length suppressed.

Fig. 2. Additional many content of the first system ment of the flute kind, played on by means of a mouth-piece at the upper end. It is generally made of box, ebony, or other hard wood; but sometimes of ivory, and has a clear and shrill tone. Its compass 

FLAG OFFICERS, a class of officers in the navy above the rank of captain, who have commands of fleets. Flag officers are divided into three ranks, and each of these three ranks into three different classes. The ranks are red, white, and blue, and the classes are admiral, vice-admiral, and rear-admiral. Flug officers may therefore be considered as numbering in all nine different ranks, which are as follows :- Admiral of the of the white, and of the blue; vice-admiral of the red, of the white, and of the blue; thirdly, rear-admiral of the red, of the white, and of the blue. The admiral of the red, of the white, and of the blue. The admiral wears his flog at the main; the vice-admiral at the fore; and the rear-admiral at the miren. There is also an admiral of the fleet, who, if in command of a squadron, would wear his flag-a union jack-at the main. commodore is occasionally a flag officer, and he is distinguished by wearing a broad pennant.

FLAG-SHIP, the nautical term applied to the line-of-battle ship, frigate, or other ressel, which carries the flag officers in command. FLAIL, flail (Ger. fleeel. Lat. flagellum). a wooden

flag officers in command.

Frail, flail (Ger. flagel, Lat. flagellum), a wooden implement employed for threshing ourn by hand; consisting of two parts yis; the handle or hand-staff, and the swiple, or part which strikes the corn; these two portions being joined together by thongs of untanned leather, called captines or coppins. It is now almost superseded by the threshing-machine. (See Theresh.

FLAKES, finite (Aug. Sax., a layer or stratum), in Hort., carnations with large stripes of colour. (See

FLARK-WHITE, a pigment, consisting of a preparation of carbonate of lead. It is much used in painting in body-colours, being a substance with which transparent colours derived from vegetable matter may be mixed and rendered opaque, so that they may be laid on veliuns or paper in the form of an even coating, possessing some degree of thickness and consistency. It is also used for putting in the high lights in drawings in water-colours, and crayon drawings in two or three tints; but it is apt to become brown and discoloured in course of time. Chinese-white, or marine-white, both of which are preparations of carbonate of zinc, are far better for this purpose and as a vehicle for preparing body-colours from simple water-colours, as they afford a white pigment of the purest nature, which will always retain its brilliancy unimpaired and untarnished by exposure to the atmosphere.

FLANBEAU, fdm'-bo (Fr.), a kind of torch made of thick wicks, covered with wax, and used at illuminations and processions in the streets at night. A flambeau

and processions in the streets at night. A flambeau usually consists of four wicks or branches, about an inch in thickness and three feet long, made of half-twisted hempen yarn. These are suspended, and white or yellow wax is poured over them from a ladle, until

or yellow wax is poured over them from a ladle, until a coating of the required thickness is obtained.

FLAMEDYANT, fläm-boy'-ant (Lat. flamma, a fisme), the name given to French ecclesiatical architecture of the 15th century, derived from the beautifully carved tracery of the windows, which appears to run in waving lines somewhat resembling the various directions taken by lambent flames of fire. This style of French Gothic architecture is also known as Opiud. Tertiare: it corresponds in a great measure with the Perpendicular English or third Pointed style; but it is characterized by far more elaborate ornamentation; characterized by far more elaborate ornamentation; and objects of rectilinear form and outline, which constitute such a marked feature of the latter style, are not so frequently introduced.

Flams, flams (Fr. flamme), in Chem.—Flame may be defined as a shell of incandescent matter surrounds.

ag a mass of combustible vapour. To produce flame it is therefore necessary that the burning body should be capable of volatilization just below the temperature at which it undergoes combustion. Charcoal or iron at which it undergoes combustion. Charcoal or iron will burn with a steady glow, more or less luminous according to the medium in which they are burnt, neither of these substances being susceptible of volatilization at the temperature at which combustion takes place. A piece of wood or paper, on the contrary, burns with a large luminous flame, in consequence of the combustible matter of which it is composed vising in vacour or becoming converted into posed rising in vapour or becoming converted into mixed gases at the temperature required for kindling the substance. Flame is, in fact, produced whenever a continuous supply of inflammable vapour or gas is made to combine with a supporter of combustion, such made to combine with a supporter of combustion, such as the atmosphere, at a sufficiently elevated temperature to cause ignition. That flame is hollow may be easily proved by several simple experiments. If a little spirits of wine or other inflammable liquid be ignited on a watch-glass, and a straw held across the flame, it will be found that the straw is charred only at the edges of the flame, the intermediate portion remaining uniquired. A still more instructive proof is afforded by placing a piece of class this or telesco-mine afforded by placing a piece of class this or telesco-mine. remaining uninjured. A still more instructive proof is afforded by placing a piece of glass tube or tobacco-ripe nearly upright in the middle of the flame of a candle, when the vapour and gaseous matter rising through the wick from the melted tallow will ascend through the pipe, passing out at the upper orifice of the tube, where they may be kindled. The heating power of a flame is in direct proportion to the energy of the chemical action that takes place, those flames being hottest and least luminous which proceed from gases containing no solid particles, as in the case of a mixcontaining no solid particles, as in the case of a mix-ture of oxygen and hydrogen in the proportion neces-sary to form water, which is one of the hottest flames we have at our command. The most luminous flames are from gases which contain just sufficient solid matter to give the maximum of incandescence without matter to give the maximum of incandescence without any of its particles passing away unburnt. Oleflant gas and the ordinary coal-gas are good examples of this as compared with the oxyhydrogen flame, which contains no solid matter on the one hand, and the contains no solid matter on the one hand, and the farm of pitch or turpentine on the other, which contains too much carbon, the excess passing off in the form of smoke. The flames used for illuminating purposes are all produced by the combustion of compounds containing carbon and hydrogen. Besides the proper proportions of gaseous and solid matter contained in illuminating substances, care must be taken to regulate the supply of air. By

paying proper attention to this, many substances are greatly improved in their illuminating properties, while others are made to give an intense light, which could not otherwise be burnt. The Argand burner and chimney, as applied to gas and camphine, are examples of this. (See Argand Burner.) The fiame of an ordinary candle is a good illustration of the phenomena of flame. At the lower, or blue portion, the hydrocarbon contained in the gases resulting from the decomposition of the tallow by heat, mixed with so much atmospheric air that the whole of the carbon unites with hydrogen none being left to sive incandescence. atmospheric air that the whole of the carpon unities with hydrogen, none being left to give incandescence. Passing higher up, we see a dark part, which consists entirely of the gaseous matter formed by the decomposed tallow. This, on being heated by the blue portion of the flame, rises in luminous vapour until it comes in contact with the oxygen of the atmosphere, when it is the second of the second or the second of the second or the second of the second or th when it unites with it, forming a bright but not luminous envelope to the incandescent carbon,—the products of the combustion being water and carbonic soid. The influence of solid matter in increasing the luminosity of a flame may be aptly illustrated by aprinkling a little powdered magnesia in the flame of a spirit-lamp, (See

GAS, ILLUMINATION.)

FLAMEN, Adi-men (Lat.), the name given to any Roman who was devoted to the service of one particular god. Each flamen received a distinguishing that the particular god that deity to whom he minisepithet from the name of the deity to whom he ministered. The most dignified were those of Jupiter, Mars, and Quirinus, and were called respectively Flamen Dialis, Flamen Martialis, and Flamen Quirinalis. The name is derived from the cap or fillet which they were on the head. When the emperors were deified, they also had flamens.

FLAMERGO, fla-min'-go (Sp. Port, flamenco), (Phonicopterus ruber, Linn.).—This bird inhabits the warm climates of Asia, Africa, and America, and is one of the climatee of Asia, Africa, and America, and is one of the most remarkable of aquatic birds. Its height is about four feet. In its first year it is of one colour,—greyish white; in its second year, the white is purer and the wings are tinted rose-colour; in the third year it attains its full plumage,—wings roseste, back deep soarlet, and quill-feathers jet black; and as the bird grows older, these colours increase in tone. The neck is slender and of great length, equalling that of the legs, which are about two feet. The head is small and round, and furnished with a hill nearly seren inches long, which is are about two feet. The head is small and round, and furnished with a bill nearly seven inches long, which is higher than it is wide, light, and hollow, having a membrane at the base, and suddenly curved downwards from the middle. as if broken. The lower mandible, which is the larger, is so adjusted as to fit the angle with its edges, its under surface being greatly arched downwards. The edges of both mandibles are serrated. In convention there would have at the archiver at least the same and the services at least the same and the same archive. uownwards. Ine euges of both mandibles are serrated. In operation, these mandibles act like a strainer, allowing the water to escape, but retaining any sort of prey the flamingo may capture. Its food consists of small fish and water insects, which it fishes up by means of its long neck, turning its head in such a manner as to take advantage of the crock in its head. take advantage of the crook in its beak. In searching among the mud at the bettom of the water for food, the upper, not the under, mandible is applied to the ground. In that situation the inferior mandible is uppermost, and by its motion works the disturbed water through the two. The tongue is large and fleshy, betokening an acute sense of taste. The flamingo's mode of incubation is peculiar. The great length of its legs, com-bined with the fact that the bird never sits down, but rests standing on one leg, renders a nest of the ordinary construction altogether unsuitable; so the flamingo constructs a tallish cone of mud, with a cavity at the top, and in this cavity the eggs are laid, and straddles across the whole, so that her feet rest on the ground

and the under part of her body on her eggs. The latter are white, and rather larger than those of the goose. Flance, flam (of doubtful derivation), the metal rim bent over in gas-pipes, water-pipes, &c., in order to join on other lengths of the same. The term is also

#### Flannel

from which a fire may be directed against the side or flank of an attacking party. Thus, the flanks of a bastion are those parts of the rampart and parapet which connect its faces with the extremities of the curtains of the enceinte on either side of it. On reference to the diegram of a front of fortification given in the article on that science (see FORTIFICATION), it will be seen that a fire from the flanks is effective in preventing an attacking party from effecting a lodgement at the foot of the curtain that lies between them, which might be done with comparative case and security if these portions of the work did not exist. A fire from the flanks of any bastion enfilades the ditch at the foot of the

FLANNEL and FLANNEL MANUFACTURE. (Sc WOOL MANUFACTURE.)

FLAT, flife (Du. plat), in Mus., a character employed to lower or depress any note or notes in the natural scale one half-tone. An accidental flat is one which, although not occurring at the commencement of the staff, is inserted in any other part of it, and only affects the har in which it is precal.

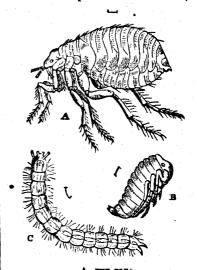
the bar in which it is placed.

Fiatulency, fat-u-lense (Lat. flatus, a blast), in Med., is a morbid collection of gases in the stomach and bowels, commonly arising from indigestion, or from indulgence in certain kinds of vegetable food. When, from any weakness in the digestive powers, food remains in the stomach in an undigested state, fermentation takes place, and gases are formed. Flatulency is ususily symptomatic of other diseases,—indigestion, colic, cholers, hysteria, or nervous debility. For its curre, carminatives, tonics, and aperients are resorted to; and strict attention to diet is necessary, taking only such food as is light and easy of digestion, and avoiding all oleraceous vegetables, peas, beans, and flatulent fruits. Weak brandy-and-water, as a beverage at dinner, is also very beneficial. When the pain is excessive, hot applications to the stomach and friction will frequently afford considerable relief.

FLAX, flaks (SAX. fleax, flex), the fibre of the Linum unitationum, separated from the woody portion of the plant, and ridded of any impurities, after which it is spun into thread, from which state it is woven into linen. (See Linum.) It is supposed to be the fruit of Eryptian discovery, as the coverings of the mummies found in the pyramids all attest to their being composed of what is generally termed flax. The flax-plant is of slender form and of annual growth. It reaches generally the height of from two to three feet, and has small lanceolate leaves, which terminate at the extremities in delicate blue flowers, which are afterwards replaced by seed-vessels, containing each ten seeds. The plant itself grows over the whole extent of Europe, Asia, and America. The time for gathering the flax is when the leaves begin to drop off, and when the stalk has a vellow appearance. The stalks are them stripped, and the seed-boils carefully gathered and stored up for the next year's supply. The first process in the preparation of the flax is to steep the stalks in water until decomposition and fermentation takes place; that causes the glutinous matter which binds the woody and fibrous parts together to become separated. The duration of this process is from six to twenty days, according to the quality of the water employed and the state of the flax plant. After the first process, the stalks are dried, and in this state they may be kept in sheaves for years. After the flax habeen "retted" (as the first operation is called) and dried, it is broken repeatedly, beaten with a flat piece of wood, and also "soutched," in order to remove all the woody particles from the fibre. The last operation is termed "heckling," which consists in combing the flax through and through, in order to remove all the spinner's hands. This process is required as much to straighten the fibre as to lessen any knots or irregularities in the flaments. The action of the heckles divides the scutched flax into two portions, the long termed "line," and the wo

#### Flea

FLBA, fie (Ang.-Sax.). — The proper position of this insect in entomological classification has been the subject of much dispute. By many authorities, including the distinguished names of Latreille, Kirtyg, and Spence, the fleas are considered to form a distinguished naturalist treating of them under the order Siphonaptera, and the latter, the order Aphamiptera. By others, they have been arranged with the order Diptera, but with little reason; for in certain important characteristics they widely differ from them. It has been truly remarked, that "it is highly probable, when this group is better known,—when the numerous insects allied to the fleas are more common in our cabinets, it will be found that they do not constitute an order by themselves, but are aberrant forms of the other well-established orders. In these, there is a certain degree of uniformity, as regards number, variety of habits, &c., which cannot but lead us to doubt the validity of the so-called orders, containing only one or two genera and but few species, such as the present orders." The curious structure of the flea has doubtless greatly contributed to perplex and hinder those who have sought to find its correct genera.



-PUPA OF DITTO. C-LARVA OF DITTO.

(All magnified.)

irritans), which is, unfortunately, very numerous in this country. The body of the files is protected by a horny covering, composed of segments, which are very well defined,—those of the thorax are always disunited. Its mouth is suctorial, formed of three pieces, inclosed by two articulated lamines, which, when united, form a cylindrical or conical proboscis, the base of which i protected by two seales. Although, to all appearance, apterous, the fice possesses the rudiments of wings, which are four in number, in the form of borny plates on the sides of the meso- and meta-thoracic segments, the hindmost pair being somewhat larger than the other. Its head is small and compressed, on each side of which is a small round eye. The most singular organs of the fice are the two fine-pointed mandibles of the mouth, which, in combination with another sharp organ (supposed to represent the lantum), constitute the powerful attacking instrument of the insect, which permits it to pierce the hard skin of its victim with remarkable facility. Situated on the anterior part of the head, are two four-pointed organs, which were formerly supposed to be the antenne, but now more correctly considered to be the maxillary

palpi. The antenna are very minute, and concealed beneath a rake-like plate on the sides of the head behind the eyes. The legs are very strong, more par-ticularly the hinder ones, which are used by the flea in its extraordinary leaps. This insect undergoes a complete metamorphosis; the larva is an elongated complete metamorphoeis; the larve is an elongated footless grub. On arriving at the pups state, which occupies about twelve days, it incloses itself in a silken cover, and in a few days assumes its mature condition. Besides Pulex irritans, there are several other species peculiar to different animals. The dog possesses such a parasite (P. Canis); also the martin (P. Hirsadinis); the mouse (P. Musculi); and the mole-flea, a large variety (P. Tulpa). A great pest of the West Indies and South America is the chegoe or ligens. (Res Chunga)

Figer. (See Chicoe.) fiche, an arrow), a small work, so called because its outline resembles the shape of a broad arrow. It consists of two faces meeting in a point, and forming a salient angle. This defensive nothers is sometimes thrown up during a siege, to enable the besieged to pour an enflading fire along some of the trenches of the enemy; or it is constructed in connection with the main works of any fortified place, to command any small valley or glen that might otherwise be made available by the enemy as a

means of approach to the fortifications.

means of approach to the fortifications.

Fibecs. (See Wool.)

Fibecs. (See Wool.)

Fibecs. OBDEOFFIBE GOLDEN, flees (Sax. flees).

This order, one of the most distinguished in Europe, was founded in the year 1430, by Philip III., duke of Burgundy. One of its privileges conferred on the successors of Philip the title of hereditary grand master of the order; and, in consequence of this, it passed over both to the environ of Autria (on account of the over both to the empire of Austria (on account of the inheritance of the dukedom of Burgundy) and to Spain, after the death of the celebrated Charles V. The order can be conferred both by the sovereigns of Austria and of Spain. The name evidently was derived from the classic legend of Jason and the Golden Fleece.

classic legend of Jason and the Golden Fleece.

FLRET, fleet (Sax. flota, fliet), the term applied to the different detachments, or squadrons, which form the navy of any country, which are stationed in various parts of the world, for defence, aggression, or intimidation. England has, for instance, her Channel fleet, her North-American fleet, and some others; as also liave the chief naval powers. In the more extended interpretation of the term, it is also applied to any company of vessels united together, and sniling with one object, either mercantile or warlike. (For further information, see separate article NAVY.)

FLEET MARNIAGES were certain irregular marriages which were very prevalent in England in the latter half of the 17th and the earlier half of the 18th centuries, and were so called from being celebrated in the Fleet prison. The persons who celebrated these marriages were clergymen of the Church of England, imprisoned for debt, who, having lost all sense of propriety, were willing thus to prosti-

lost all sense of propriety, were willing thus to prostitute their calling. Young ladies were compelled to tute their calling. I doing males were compened to marry against their wills, and young men were in-veigled into marriages with the most worthless characters,—while prolligates found it very convenient, as enabling them to enter into a union which they could dissolve at pleasure. The accounts of the number of dissolve at pleasure. The accounts of the number of marriages thus celebrated are almost incredible. Attempts were made to stop the practice by acts of parliament; but these were of no avail against persons who had nothing to lose. At length, however, this enormity was brought to a termination by 26 Geo. II. c. 33, which declared that marriages solemnized in o. 35, which declared that matriages sciennized in any piece other than a church or public chapel, and without due publication of the banns, or license obtained from a proper authority, were not only void, but subjected the person sciennizing them to felony, punishable by transportation for fourteen years. (See Marriage.)

First Passon, a celebrated London prison, pulled down in 1845, and so called from being situated on the down in 1920, and so called from being situated on the lime, and a small quantity of chloride of sodium.

There, is rapid stream which flowed into the fine the classification of the insect tribe, and the name by once at least as early as the 13th century, and to it which it is distinguished in this order is Mucca comistered from committed those who had incurred the displeasure of the Star Chamber. When that court domestica. The insect is termed fleat-fly, from the fact was abolished, it became a prison for debtors, and for

persons charged with contempt of the courts of Chancery, Exchequer, and Common Pleas. This prison was burned in the great fire of London, in 1686, and again during the Gordon riots, in 1780.

FLEMISH LANGUAGE AND LITERATURE, flem ish (Ger. Flämisch or Vlämisch).—The Flemish is the vernacular language of the Flemings, an ancient people vernacular language of the Flemings, an ancient people who inhabit certain parts of Belgium and Holland, and who number upwards of 2,000,000. It is a form of the low German, and the Dutch of the present day is a modern offshoot of it. It is more palastal and nasal than the language of Holland, which, on the other hand, is more guttural; but the differences are not essential. So little change has taken place in this language, that the earliest monuments of its literature, an ordinance of Duke Henry I. of Brabant (1229), is perfectly intelligible in the present day. Among the an ordinance of Duke Henry I. of Brabant (1229), is perfectly intelligible in the present day. Annon the more remarkable of the earliest works in this language are the Rymbybel, or Bible in rhyme; and the Spiegel autoricel, the Historical Mirror, of J. Van Meerlans (born in 1235); the Civic Laws of Antwerp (1300); the Chronicle of J. Van Clere, and many others; a translation of Boethius, by Jacob Velt, of Bruges, of the 15th century; and the "Hive of the Catholic Churck," by Philip Van Marnix (1569). Many French forms of speech were introduced during the Burgundian reign, and also many Dutch during the sway of the Hapsburge; so that the old Flemisk lost much of its purity and terseness. Hooft, Voudel, and Cats, are the three men whose names figure most prominently among the writers of the 17th century; but the 18th furnishes scarcely any name of note. Under Napoleon, every effort was made to suppress the use of this laneffort was made to suppress the use of this lan-guage and introduce the French; and it is only since the revolution of 1830 that the Flemish has again come to occupy its former position. Since that time numerous societies and unious have been formed, newsrous societies and unious have been formed, newspapers and periodicals published, and other means adopted, with a view to diffusing a knowledge and a taste for the cultivation of this language. Among the names of those who have most exerted themselves with this object, are Willems, Blommaert, Van Ryswyck, Conscience, Van de Voorde, Delecourt, Dantzenberg, Van Buyse, Snellaert, de Laet, Dedecker, David, and Bormann. The government was at first opposed to, or at least looked with coldness upon, this movement; but, latterly, it has come to recognize it and give it countenance. On the occasion of a linguistic concress at Ghent, in 1841, the members of a linguistic congress at Ghent, in 1841, the members of the government, for the first time, publicly addressed the people in the Flemish language. Besides the Flemish grammars of Van Beers and Heremans, and the dictionary of Sleecz, we may mention Vandenbossche, Nouvelle Grammaire raisonnée pour apprendre bossche, Nouvelle Grummaire raisonnée pour apprendre le Lannad et le hollandais, Lille, 1825; J. Desroches, Grummaire flamande, Antwerp, 1926; Vundenhoven, La Langue flamande, son passé et con avenir, Brussels, 1844; Lebrocquy, Analogies linguistiques; du flamand dans ses rapports avec les autres idiomes l'origine tentonique, Brussels, 1845; Desroches, Nouveau Dictionnaire français-flamand et flamand-français, Ghent, 1805; Olinger, Nouveau Dictionnaire françois-flamand, Malines, 1834.—See, also, Sleecx on the History and Relations of the Flemish to other Languages.

FLESS. Resh (Sax. flace). a commound aubstance.

FLESK, flesh (Sax. flee), a compound substance, constituting a large portion of every animal; consisting of the softer solids, as distinguished from the bones ing of the softer solids, as distinguished from the bones and finids. As a general appellation, it may be taken to include the blood-vessels, nerves, cellular tissue, &c. (See Muscha, Trissua.) Chemically considered, flesh consists of fibrin in a coagulated form, permeated by at least three times its weight of water and fluid, consisting partly of blood sad partly of substances secreted from it. The soluble matters consist obiefly also for the blood two animal of the blood two animals. secreted from it. The soluble matters consist onemy of albumen, the soluble saits of the blood, two animal principles, called kreatine and urorite, and phosphoric, lactic, butyric, acetic, and formic acids. The saits consist of the phosphate of potash, magnesis, and lime, and a small quantity of chloride of sodium.

FLESH-FLY belongs to the general order of Dipters in the land the name by

#### Fleta

larvæ are hatched. It is generally larger than the common house-fly, and its wings indeed are sometimes nearly three-quarters of an inch in expanse. It is dis tinguished by a proboscis, always very apparent, mem-branous, and bibliste, generally bearing two palpi, and capable of being withdrawn entirely within the ord cavity: it also has a stoker of two pieces; the antenna in a plate with lateral setm.

FLETA, flo'-tu, is the name of a valuable treatise, in FLETA, 160'-121 is the name of a variation creame, in Latin, on the law of England, and is so called from its having been written in the Fleet prison. Nothing is known of the author; but it must have been written about the thirteenth year of the reign of Edward I. It is one of the earliest authorities on English law, and gives a complete account of it as it stood at the

time the author wrote.

FLEUR-DE-LIS, flur-de-le' (Fr.), the heraldic term for the flower of the water-lily or yellow flag, which constituted the principal feature in the armorial bearconstituted the principal feature in the armorial bearings of the monarchs of France prior to the execution of Louis XVI. and the establishment of the first French republic. It was introduced into the arms of France about the year 1140, being first borne by Louis VII. This monarch, who had exercised regal power during the lifetime of his father, had probably adopted and worn it even prior to this date as his badge or cognizance, as the Plantagenets distinguished themselves by hearing a saving of brooms and from themselves by bearing a sprig of broom; and from this circumstance its present name may be derived, being a corruption of near de Loys, or flower of Louis. Some, however, believe it to be so called because it grew in great abundance on the banks of the Lys, a river rising in the north of France, and joining the Escaut near Ghent. It is used as an ornament of the crown of the English sovereign, and the regal insignia of many of the continental monarchs, and it forms, in Her., the mark of cadency for the sixth son.

FLEXIBILITY, fleks-e-bill-e-te (Lat. flectere, to bend), a property which all bodies possess to a greater or less degree, which is evinced in their disposition to yield or change their form in a direction at right augles to their length, through their own weight or by means of any pressure or strain applied to them. Pieces of the same material differ from each other in the degree of flexibility they exhibit, in proportion to their length and thickness. Thus it is evident that a cylindrical bar of iron an inch in diameter and twenty feet in length will exhibit a far greater degree of flexibility than another which is only half the length, and has a diameter of two inches. This may be seen by resting the extremities of each on supports of equal beight, when the long bar would become curved in form through its own weight, its centre being considerably below a chord drawn from one end of it to the other; while the thicker bar would be scarcely bent out of the straight line. Materials also exhibit a greater degree of flexibility in one condition than in another; metals, for instance, yielding far more readily another; metals, for instance, yielding far more readily to pressure when beated than when cold. A wroughtiron beam which would sustain a great weight without perceptible deflection when cold, would bend considerably under the same weight when red-hot. The great flexibility of ropes of hemp and metal renders it quite impossible to stretch them horizontally in a straight line, as may be seen in the case of a rope stretched for the performance of a tight-rope dancer. There is no material that will not exhibit flexibility in some degree, because there is no substance in nature that is perfectly rigid and inflexible; but the degree of flexibility possessed by any material is denoted by the extent to which it will bend, or by the weight which it will support without breaking. This property must not be confounded with that of elasticity; elastic bodies will return to their former shape when they have been bent or aftered by pressure in any way; but bodies which possess flexibility without elas-ticity do not return to their original form in all cases. A straight bar of iron, though bent by its own weight A straight bar of iron, though bent by its own weight, only, will not exactly resume its original shape, although a rope will do so. The consideration of the deflection or flexibility of beams of wood and iron bars and girders, as well as of ropes and chains, and other materials, is an important point in the construction of buildings, bridges, and engineering works of various kinds. (See MATRIALS, STRENGTH OF.)

## Floating Islands

FLEXOE, fick'-sor (Lat. fiecto, I bend), in Anat., is the name of certain muscles whose office it is to bend the parts into which they are inserted. The antago-nistic muscles are termed extensors.

FLINT, flint (Ang.-Sex.), in Min., the well-known silicious nodules and concretions occurring so abundantly in the chalk strata of England, and many other calcareous strats. Fints are composed almost entirely of silica, with traces of iron, clay, and lime. The formation of flint has long been a disputed question amongst geologists: the dialytic discoveries of Graham and Church throw great light on the matter. If a solution of silica be prepared by dialysis, and poured into a vessel containing a very minute quantity of carbonate of lime, the whole becomes rapidly pectised, assuming: the gelatinous form in a few minutes. From this it will be easily seen what would happen if a lake or river, containing a notable quantity of silica in solution, were to suddenly flood a chalk plateau. Flint is of great importance as an economic product, being largely used, when calcined and ground, in the manufacture of china. in the chalk strata of England, and many other calca when calcined and ground, in the manufacture of china, porcelain, and glass. In parts of the country where fints are plentiful, it is much used as a building material, with excellent artistic effect.

Film GLASS. (See GLASS.)

FLINT GLASS. (See GLASS.)

FLINT IMPLEMENTS AND WEAPONS are relies of the primitive inhabitants of Europe, which have been discovered from time to time, by being accidentally turned up whitst ploughing in fields, or by the sealous search of some indefatigable antiquarian. Those which have of some indefatigable antiquarian. Those which have already been discovered do not differ in the slightest respect from the rade weapons constructed of flint which are used even in the present day by the savages inhabiting portions of Asia, America, Africa, and the islands in the Indian Archipelago and the South Seas. Arrow-heads and hatchets are the forms in which the weapons are mostly discovered, and there is an nu-limited variety in the shape and construction of even these. Some capital specimens can be seen by the inquiring reader in the British Museum; and amongst them must be specially noted the flint implements which were found alongside the remains of an elephant in the year 1715, in Gray's-Inn Lane, London. Not long since geological students invested these flint implements and weapons with some considerable amount of interest, as they thought that by these means the date at which the larger classes of mammalia, such as elephants, &c., celled to exist in Europe, might be discovered. As yet (1862), however, their exertions have not met with nuch success, as it is nearly impossible to affix any assigned period at which these implements and weapons were commonly used. In the South of France, in Norway, and in England, these distant traces of our ancestors have been mostly discovered; and it is a fact that flint weapons were used by the Druids in England

long before the invasion of the Romans.

FLOATING. (See Swimming.)

FLOATING BATTERY, flote'ing bat'-te-re (Sax. flotan, to float), in nattical language, a term applied to a hulk which has been cut down and rendered as strong and shot-proof as possible, and in which are placed heavy cannon and mortars for the purpose of defending or attacking barbours and other maritime strongholds. This species of war-vessel was first used at the siege of Gibrsitar, in the years 1779—1783; and it was again brought into use during the Crimean war. On account of their clumsiness, and the difficulty of navigating them, floating batteries are, however, not much in

request at the present day.

FLOATING BRIDGE. (See FERRY-BRIDGE.)
FLOATING ISLANDS, GARDENS, AND HOUSES.—Gardens and islands, formed of patches of wood and weeds, covered with grass, flowers, and other vegetable productions, supported on the surface of the water. On the English lakes there are one or two of these natural eccentricities, and on the Ganges, in India, they natural eccentricities, and on the Gunges, in India, they are continually passing down the river, being detached from the banks by the force of the currents. On these latter, tall trees are often seen; and it presents a curious spectacle to observe these monarchs of the forest borne down by wind and tide on the bosom of the waters on some compact little island, which seems created for their especial sovereignty. In ancient mythology, the island of Delus, one of the Cyclades, was supposed to be endowed with floating powers, and to

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#### Float-stone

be capable of sinking below the surface of the deep, and be capable of sinking below the surface of the deep, and rising again at various intervals, in some new spot. In northern India, and on the borders of Thibet and Persia, foating gardens are often erected by the natives, for the purpose of raising melons, encumbers, and other similar vegetables and plauts, which require a very equeous soil for their cultivation. These gardens, however, a property of the contraction of the contra ever, are of a very fragile nature, and rarely exceed a ever, are of a very fragile nature, and rarely exceed as foot in depth of soil, their prime structure being com-posed of wickerwork, interlaced with reeds and watlings, and severed with matting, over which the earth is placed. Floating houses are built by the inhabitants of Bangk'ck, the capital of Siam, from motives of comfort and safety. These houses form whole streets, being anchored in rows, and are capable of being moved from one position to another at pleasure. From the depth of water, large vessels of from 200 to 800 tons burden can sail up this picturesque town, and pass alongside the houses of the inhabitants. These floating houses are made of bamboo-stems, wickerwork, and palms, with a verandah in front; and they are built on large rafts. Sir John Bowring gives a capital account of them

in his sketch of Siam.

FLOAT-STONN, flote'-stone, in Min., a porous, soft, and frisble mineral, consisting of silica, alumins, and carbonate of lime. From containing numerous pores, it holds a large quantity of air, and swims on water until

holds a large quantity of air, and swims on water until it is saturated; hence its name.

FLOCOILATION, flok-sil-lai'-shun (Lat. floccitatio, from floccus, a lock of wool), in Med., is a term applied to the picking the bedelothes, which is sometimes observed in fever and other patients, and which is always regarded as a symptom of great danger.

FLODDEN FIELD, BATTLE OF, flod'-den, was for the Scots one of the most disastrous encounters that ever took place, between them and their southern focus

Scots one of the most disastrous encounters that ever took place between them and their southern foes. James IV. of Scotland, a warlike but rash king, crossed the Tweed at the head of a large army, on 22nd August, 1613. Henry VIII. was at the time in France; and the defence of the country fell to the earl of Surrey, who as quickly as possible assembled an armed force to meet the Scotch king. James, instead of at once taking decisive steps, lingered near the border, until, by desertion, his army was reduced to 30.000 men. On the 6th tion, his army was reduced to 30,000 men. On the 6th of September he encamped on Flodden, the last of the Cheviot hills, in Northumberland; and on the morning of the 9th, Surrey, by a skilful movement, took up a position between the Scotch and their own country. The battle commenced about 4 o'clock in the afternoon of the same day. The Scotch left wing, under the command of the earls of Huntly and Home, speedily put to flight the English right wing; but the High-landers on the right wing were unable to stand against the severe execution of the English archers; they rushed upon them in disorder, and were soon forced to flee. Meanwhile, the battle was raging with great fury nee. Meanwhile, the battle was raging with great tury between the two centres. James, surrounded by his nobles, charged upon Surrey with such force as to penetrate within a few yards of the royal standard, when he was at length cut down, and all his followers perished with their king. The loss of the Scots was about 10,000, including the flower of the nobility; while the loss of the English was only about 7,000, and mostly men of inferior note. "Scarce a family of eminence," men of inferior note. "Scarce a family of eminence," says Scott, "but had an ancestor killed at Flodden; and there is no province of Scotland, even at this day, where the battle is mentioned without a sensation of terror and sorrow." The last canto of Scott's "Marcontains an accurate and animated description of the battle of Flodden.

FLOGGING, flog-ging (Ang.-Sax.), a term generally used instead of the more correct appellation of corporal punishment. Flogging is a degrading system, which has exploded from our code of punishments (except in cases of boys or youths convicted of misde-(except in cases of boys or youths convicted in inde-meanor), and it is only kept up in the army and navy; in both of which services, however, it has but a very feeble footing. Until within the last few years, the punishment of flogging, usually administered with "a cat-o'-nine-tails," used to be one of the most horrible catto mine-tails, used to be one of the most norrhiel features in our service; but it is now, happily, nearly banished. Except in the most extreme cases, it is seldom resorted to, and a man has every chance of avoiding it, being obliged to repeat the same offence, which must be disgraceful, twice before being liable

#### Floor-cloth

to the "cat." In the middle ages, flogging used to be one of the most favourite methods of punishment, and criminals were often whipped through the town or towns on conviction of the most trifling offence.

FLOOD. (See DELUGE.)

FLOOD-CLOTH, flore kloth (Sax. flor, floor), strong canvas woven from yarns made of hemp and flax combined, the surface of which is coated with paint, in order to render it a stout, solid, and durable covering order to render it a stont, sold, and durance overing for the floors of passages, entrance-balls, staircases, &c. The canvas used for this purpose is made in pieces about 100 yards long, and varying from 18 to 24 feet in width. This is done to obviate the necessity of joining narrow slips of canvas to form wider pieces, in which the seams would produce an unsightly appearance, and be attended with inconvenience when laid down, on account of the extra thickness of the floor-cloth in those parts where the lengths had been sewn together. For narrow floor-cloths for stairs and passages, the broad webs are cut to the width required. The following in the process word in the process with the pr orosa wees are cut to the width required. The following is the process used in the manufacture of this material:—The canvas is first cut into pieces of the required length and breadth, and the edges are fastened to the four sides of a large frame, which are then drawn apart by machinery, to stretch the canvas as tightly as possible, somewhat in the manner adopted in straining cauvas for Berlin-wool work. The position of the frame is vertical, the height being equal to the width of the canvas: when this exceeds six or eight feet, the upper part is reached by means of light scaffolds or sta which the workmen can move from one end of the piece to the other throughout the entire length, whenever occasion may require it during the process of painting. The canvas is then in a proper condition for the reception of the size and paint, which is iaid on to a tion of the size and paint, which is iaid on to a tion of the undergo the final process of printing. It is first coated with strong size on both sides, and while this still damp, the canvas is rubbed all over with pumices the size is still damp, the canvas is rubbed all over with pumices. stone, to render it smooth and even. When the size is dry, the canvas receives two coats of paint on each side. The first coat is very thick, being more like mortar than paint; it is laid on in lumps and patches, and smoothed all over the web with a broad flat trowel, in a manuer resembling that in which plaster is laid on a wall. When this is thoroughly dry, the surface is again rubbed with pumice-stone, and a second coat of thinner paint is laid on with a brush. The under side of the canvas requires activing rount to be down to it ofter this but the uncernothing more to be done to it after this, but the upper side receives two or three more coats of thin paint, being rubbed with pumice-stone after each coat has been laid on, in order to produce a smooth surface to receive the printed pattern. The canvas is now re-moved from the frame and wound round a roller, from which it is allowed to pass over a flat table, to receive the impression of the blocks. Formerly the patterns were stencilled, as the walls of rooms were before paperhangings were introduced; that is to say, they were produced by putting colouring matter on the surface, through holes and lines punched in a sheet of tin or pasteboard, so as to form the design required; but now the printing is effected by blocks, a separate block being required for every colour introduced into the pattern. The blocks are about fifteen inches square, and are made of deal, faced with wood of a fine close grain, with a handle at the back; that part of the pattern which each block is required to imprint on the canvas is left on its surface in relief, the remaining part being cut away, as in a wood-engraving. The surface of the projecting por-tion of each block is further cut into small squares, technically called teeth, by narrow grooves crossing each other at right angles. This is done to effect an technically called the growth of the same and other at right angles. This is done to effect an equal distribution of the paint, as if the surface of the projecting part of the blocks were left smooth and even, it would take up the colouring matter unevenly, and transfer it to the floor-cloth in irregular patches. The impression is effected by applying the surface of the block to a pad or cushion charged with the colour required; after which it is transferred to the floor-cloth by means of the handle at the back, and pressed forcibly by means of the handle at the back, and pressed foreign upon it. It is then removed, charged again with colour, and pressed on the canvas close by the side of the first impression, points being placed at the corners of the blocks to insure the regularity of the joining of the pattern. This process is repeated until the whole of the floor-cloth has been covered with that part of the

pattern which is imprinted by the first block that is used, after which the blocks intended to convey the remaining colours to its surface are used in a similar manner, until the pattern is complete. It must then manner, until the pattern is complete. It must keen be allowed to dry, care being taken to give the colouring matter sufficient time to harden thoroughly before the floor-cloth is taken into use. The borders along the sides of narrow pieces of floor-cloth intended for passages, are produced in the same manner, by blocks of the recessary width similarly morared for the of the necessary width, similarly prepared for the purpose. It should be stated that worn-out Brussels carpets afford a good foundation for floor-cloth, and may be converted into that material at any floor-cloth may be converted into that material at any floor-cloth manufactory. A cheap and durable covering may be made at home for passages, and even for rooms, by a method suggested by Mr. Loudon, in his "Encyclopedia of Cottage and Villa Architecture." For the former, a single length of strong unbleached calico will be required for the ground-work or foundation of the material; but for the latter, the lengths of calico must be joined together, until a piece has been produced of sufficient breadth to cover the room for which it is required. New salico, however, is not absolutely required. required. New calico, however, is not absolutely requi-site, as any pieces of calico or linen that are useless for any other purpose will do quite as well for the basis of the floor-cloth, after they have been neatly joined together. The calico must first be stretched on the floor by tacks, or by pasting down the edges to the boards, after which it must be covered with two or three coats of stout waste paper or newspaper, pasted together with a strong paste, to which a little alum has been added while boiling. Over this a layer of paper past of the walls of rooms must be pasted, which has used for the walls of rooms must be pasted, which may be laid on in lengths, or formed of separate pieces put together, to furnish a design suggested by the taste of together, to furnish a design suggested by the taste of the maker. When dry, the floor-cloth must be first painted over with a coat of strong size, next with two coats of boiled linseed oil, and lastly with copal varnish. Floor-cloths made in this manner are strong and inexpensive, and may be washed as well as those that have been made in the ordinary way. A cheap kind of floor-cloth has been lately introduced for the protection of carpets and stair carpets, somewhat similar to oil-baize, or oil-cloth for table-covers. It is made on a foundation of thin calico, and thinly coated with paint on one side only, after which the pattern is imprinted in the usual way, or by rollers.

way, or by rollers.

FLOORS, FLOORING, flores, flore'-ing, the name given to the stages or platforms which separate the successive stories of a building, from which the stories themselves are generally named in their order; as ground flore flores flores are generally named in their order; as ground flores flo floor, first-floor, second-floor, &c. In the large and lofty houses that are to be seen in Edinburgh, which are copied from those of continental cities, the floors are termed flats, and are let out to the tenants as comare termed lists, and sre let out to the tenants as complete and separate dwellings. The entire platform which separates any room from another, above or below it, consists of three distinct portions,—the joists, the flooring of the room above, and the ceiling of the room below. The joists are narrow beams of timber about 24 inches in thickness, and varying in depth according to the extent of span from wall to wall. As the walls of the successive stories are raised to the proper height, the joists are laid across about fifteen or eighteen inches apart, and the ends are imbedded in the masonry. In building a row of houses, care should be taken to keep nine inches at least of masonry between the code of the joists bridging the space from party-wall to party-wall, to prevent them from communicating the flames from one house to another by reason of their contiguity, should a fire break out in any one of them. To give greater stiffness and steadiness to the joists, they are often connected by short cross-struts of timber nailed transversely to the sides of the joists and across each other in the form of the latter X, at intervals of two or three feet. The ceiling is made by nailing laths across the bottom of the joists and covering them with two or three coatings of plaster. (See PLASTREINE.) The flooring consists of red or yellow deal planks about nine or eleven inches in width. The boards are laid transversely on the joists, and

laying down and nailing the boards. When a very close floor is required, the planks are generally jointed together by means of agroove and tongue. (See Journary.) The thickness of the boards varies from one to 14 inch. After the planks have been nailed to the joints, the brads are driven below the surface with a punch, and the edges of the boards are planed, that any inequalities may be removed and the whole extent any inequalities may be removed and the whole extent of flooring rendered perfectly level. The kind of floor that has just been described is termed a single-joisted floor. and is that which is usually found in buildness of floor in the thing is the twich is usually found in buildness of floor, and is that which is usually found in buildings of an ordinary character, where the span from wall to wall does not exceed twenty-four or twenty-five feet. In does not except twenty-nour or enemy-nive area. In small houses, the joists over a span of this extent are often rendered more steady by allowing them to bear on the framed partition between rooms below them, or on the semi-partitions on either side of folding-doors.
When the span exceeds this length, and the platforms are intended to support any great weight, as in a concertroom, assembly rooms, or warehouse, framed floors are adopted, in which wrought-iron girders are introduced.

FLORALIA, flo-rai'-le-ii (Lat.), a festival which, in ancient Rome, used to be celebrated in honour of Flora, the goddess of flowers. These ludi florales, according to Pliny, were instituted, by order of an oracle of the Sibyls, on the 28th April, 238 B.C., and, after having been discontinued, were re-established in alter naving been discontinued, were re-established in 173 B.C. They were principally celebrated during the night-time in the patrician quarter; but some authorities allege that they were held in a circus erected on the hill Hortulorum.

FLORICULTURE. (See HORTICULTURE.)

FLORICAL, floridus, flowery), in Bot., a term applied by some writers to the sub-class Petaleidæ (which see).

FLORICAL REGINER (See PERPREDICULTE ENGLISE)

FLORID ENGLISH. (See PERFENDICULAR ENGLISH.)
FLORID ENGLISH. (See PERFENDICULAR ENGLISH.)
FLORIN, flor'-in (Fr.), a name now applied to a
two-shilling piece in England, but which was formerly
a gold coin, circulated in Italy during the 18th century.
Its name is supposed to be derived from the fact of its being struck at Florence, or from a flower (lily) being imprinted on its reverse. A coin of Austria and Germany is also called a florin; but it is not of the stan-

many is also called a florin; but it is not of the standard of the English one, as its value varies from two shillings to one-and-eightpence.

FLORINIAES, flor-in'-ylns, a sect of Gnostics of the Zisi century, who were so called after Florinus, a Romish priest, and who inclined to the views of the Yelentinians. They maintained that light and darkvesterinam.

ness were two eternal principles, from which, respectively, all the good and evil in the universe had proceeded. (See GNOSTICISM.)

FLOSS SILK is carded like wool or cotton, and subse-

quently spun into a coarse thread or yarn for the manufacture of shawls, socks, or other common silk manufacture of snawls, socks, or other common slik fabrics. Floss silk is that portion of ravelled silk which is broken off in winding off the cocoons. In preparing it, it is first steeped in water, after which the gummy matter contained in it is pressed out. Upon being dried, a small quantity of oil is worked into it to render it more plant. Subsequently it is carded, and then spun. At the present day, superb fabrics of this material are produced in France, as

also in this country.

FLOYILLA, flo-til'-lit (Rp.), signifies, properly, a little fleet; and though sometimes used in this sense, it is more frequenty applied to a fleet of whatever size, composed only of small ressels. In this latter cense, the term was applied to that immense naral armament with which Napoleon meditated the invasion of

Britain.

FLOTSIM, flot'-sum (floating), is a law term, generally used in connection with the equally uncouth and barbarous terms jetsam and ligan, and applied to the goods of a vessel wrecked at sea. Flotsam is applied to such of the goods as continue floating on the surface of the waves; jetsam is where they are cast into the sea, and there sink and remain under water; and ligan, is where they are sunk in the sea, but tied to a cork or buoy in order to be found again. If no owner secured to them by long floor-brads, after having been appears to claim them within a year and a day, they pressed tightly together by the action of a screw that can be attached to the joists in the position required, and at any part, like a vice, during the process of things flotsam, jetsam, and ligan will not pass.

#### Flounder

FLOUNDER, flown'-der (Swed. flundra), (Pleuronectes flexus), a flat flah very simi-



PLOUNDERS.

to the plaice, but smaller, and of more obscure It is colour. very common about the British coast, and is found in the Northern, Bal-tic, and Mediterranean seas.

Ita body is co-

vered with very small scales, and along its back runs a row of sharp spines. FLOUR, flowr (originally flower, Fr. fleur), the finely

ground meal of wheat, and of any other corn or cereatic which has been reduced to powder in a mill. (See FLOUR-MILLS.) The component parts of flour are starch, gluten, sugar, gum, bran, and water, the prime element being starch. No substance is more adulterated than wheat-flour; and there are several modes of detection, the best of which is the specific-gravity test, as a vessel which contains one pound of wheat-flour will contain nearly a pound and a half of any other. Some chemical tests are also extremely good. Firstly, nitrio acid, which has the effect of colouring wheatnitric acid, which has the effect of colouring wheat-flour of a fine orange-yellow, while it does not affect the colour of fecula or starch; secondly, muriatic acid colours bond fide wheat-flour of a deep violet, but dissolves fecula and starch into a light viscous fluid, which is decomposable by the admixture of any alkali. Another test is the amount of ash left after the sample being burnt. Wheat-flour yields on the average 0.8 per cent. vereflour 1.0; hear, and nearmenl 3; and

per cent.; rye-flour, 10; bean, and pea-meal, 3; and linesed-meal, 10 per cent. of ash, by which means adulteration can be detected.—Ref. Ure's Dictionary.

FLOUR-MILLE, mills used for the purpose of grinding flour. Before the invention of the steam-engine, the windmill was principally used for this purpose. (See the article on WINDMILL for the details of its mechanism. anism.) In modern times, great improvements have been made in the machinery employed in grinding flour. In the ordinary method there are two circular stones used, each being about 4½ feet in diameter. They are in the form of flat discs, the lower one being fixed in a level position, while the upper one revolves horizontally on a vertical axis, with a speed of 100 to 120 revolutions per minute. Millstones are made of normalization of vertices axis, with a special of the 120 revolutions per minute. Millstones are made of various substances; but those in general use for grinding wheat are made of a very hard silicious stone imported from France, the technical name for which is burn or bukn. This stone is so porous that it sometimes requires to be filled up in parts with a composition of alum and grit; and yet it is so hard that a pair of stones in full work will last for twenty or thirty years. The surfaces of the stones are channelled or grooved. On account of the friction and the velocity of the upper stone, much heat is generated in grinding; and the flour thus produced is overground, and apt to clog into thus produced is overground, and app to corg muo humps. In order to avoid this, many plans have been invented of late years. Among these may be men-tioned that of Bovill, in which two ranges of millstones are driven by one central shaft. It is distinguished by an arrangement by which the meal or flour is dried by means of steam and hot air,-a method by which the manufactured flour, often in too dry a state after grinding, is moistened by steam; an arrangement for washing, is moistened by steam; an arrangement for washing grain and then drying by means of hot air; and lastly a contrivance by which the passage of the ground flour is facilitated. In Westrupp's conical mill there is a conical revolving stone beneath the upper stone, which is fixed. The upper stone is a hellow cone, and the lower stone fits into it. This kind of flour-mill grinds the wheat more completely than an ordinary mill, as the flour comes away from the stones more easily, and leaves less faring in the bran. In Schiele's mill a concare revolving surface multage and the stones more carried surface are the assint a convex thad surface. This is done in order to avoid the friction which re-sults from the contact of conical surfaces. Besides those mentioned, there have been improvements the produced into the mechanism of flour-mills by in its turn, and is displaced by a rush of cooler air; and

## Flue

Corcoran, Gordon, Taylor, Pinel, M'Lellan, Banks, Geodier, Spiller, Valok, Seeley, Harwood, White, and others. During the Orimean war, an important experiment was made by the English government. Two steambests were despatched, one fitted up with apparatus for the purpose of grinding flour, and the other for baking. The mill was found to be capable of grinding twenty bushels of flour per hour, even when the vessel was going at the rate of seven or eight knots an hour. When the steamers arrived at Balaclava, the mill was able to grind 24,000 lbs. of flour per day. Flour-mills have recently been made on a very extensive scale. In one mill near Blackfriars Bridge there are upwards of thirty pairs of millstones. thirty pairs of millstones.

FLOWER, flow'er (Fr. fieur), in Bot., that portion of a plant which is formed by the union of all the organs which contribute to the formation of the seed. In which contribute to the formation of the seed. In common language, the word is used to convey the idea of the portion in which the gavest colours are found. A complete flower consists of the essential organs of reproduction, inclosed in two particular envelopes which protect them. These essential organs are called the pistil and stamens. The floral surelopes are termed calvar and corolla. The extremity of the peduncle, or pedicel upon which the parts of the flower are placed, is called the thalamus or receptuals. (See the italicised words.) words.)

FLOWERING PLANTS. (See PHANNEOGAMIA.)
FLOWERLESS PLANTS. (See CHYPTOGAMIA.)
FLOWERS, ARTIFICIAL. (See ARTIFICIAL FLOWERS.)
FLOWERS, COLOURING MATTERS OF.—Fremy and Cloez consider that the colouring matters of flowers may be divided into cyanine, or blue, which, with different portions of aoid, forms purples and reds, and yellow, or manhine, which, with alkaline juices, gives different shades of yellow and brown.

Flowers, Linguage of. (See Linguage of

FLOWERS.)

FLOWERS.)

FLUE, flu (probably from Lat. flumen), a narrow passage in the wall of a house, running from the bottom to the top, and constructed to carry off the smoke that arises from burning any kind of fuel in a grate or stove. The expression may be considered as being almost synonymous with the term chimney, although it is more particularly applied to that part of the passage which is between the gathering or funnel of the chimney (see Fireplace), at the base, and the upper extremity of the chimney-shaft, which generally rises for some distance above the roof. The part in which a junction is formed between the gathering and the flue is called the throat of the latter. When a number of flues are unit close together in a party-wall between of flues are cuilt close together in a party-wall between two houses, or in the gable-ends of a single house, the wall itself is called a stack, or chimney-stack; and the wall isser is cause a stack, or chimney-shaft. The walls which separate flues built side by side in a stack are called withs, the walls which form their front and back being named the breast and back respectively. The horizontal section of a flue is generally oval or circular in form when the wall is built of stone, and rectangular when it is of brick. When flues are built side by side in the partywall of two houses consisting of three or more stories, that which rises from each fireplace is constructed to pass upwards through the wall on one side of the flue which is connected with the fireplace in the room immediately above. Chimneys in party-walls, conse-quently, assume a winding form; but all turns in a chimney should be gradually curved, care being taken to avoid angles, which afford convenient places for the accumulation of soot, and impede the free passage of the sweeping-machine through the flue. In addition the sweeping-machine through the flue. In addition to this, angular turnings in flues frequently lessen the free draught of air that is necessary to carry off the smoke of the burning fuel below, and thus offer an obstruction to its ascent which cannot be readily removed. The cause of the ascent of smoke in a chimney is simply this:—the fire burning in the grate heats the air in the flue, and causes it to become much lighter than the cooler air that fills the apartment with

this process being continually and rapidly repeated, an upward current of air is produced, which carries off the smoke and vapour arising from the combustion of the fuel below. To prevent a chimney from smoking, it is necessary to let the fine be as high and as straight as it possibly can be; since the draught will be greater in proportion to the height of the chimney and the absence of all interior obstructions in the shape of elbows or angular turnings. In the next place, the opening of the fireplace and the threat of the chimney should be as small as they conveniently can be, that the greater part of the accending air may pass through the fire prior to its ascent, and that the contraction of the chimney may cause it to rush through the narrow vent formed for its escape with greater force. The expediency of reducing the opening of the fireplace as far as appearance will admit, may be shown by holding a newspaper before the orifice above the cavity which contains the fire. This will cause the fire to "draw instantaneously, and break into a blaze; an effect ap" instantaneously, and preak into a plaze; an enec which is produced solely by lessening the opening by which air is admitted into the chimney, and thereby causing the air itself to pass through the fire before it makes its way into the flue. If a chimney be constructed under the conditions above mentioned, it will very rarely be found to smoke; and even amoky chimneys may be cured by having recourse to these precautions, and by removing any obstacle that may exist in the interior to the free passage of the air and smoke. Even downward currents of sir, which frequently cause a chimney to smoke when it is surrounded by buildings as high or higher than itself, may be prevented from causing any serious annoyance by the adoption of these means. To prevent the entrance of sudden gusts and eddies of wind, the chimney-pots, which are almost always placed on the chimney-shafts to contract the space through which the smoke escapes into the open air, are generally surmounted with a revolving cap or cowl made of metal, which is constructed in such a manner that it is turned by the wind like a vane, and constantly presents the orifice through which the amoke issues to that quarter which happens to be exactly opposite to the point from which the wind is blowing.—Ref. Count Rumford's Essays, Political, Economical, and Philosophical.

FLUID, flu'-id (Lat. fluidus, from fluo, I flow), is defined to be that whose component parts or particles yield to the slightest pressure, and are moved or disseminated amongst each other without any apparent sensible resistance. Some writers on scientific subjects distinguish between fluids and liquids. All liquids are fluids; but it does not necessarily follow that all fluids are liquids: for air, ether, mercury, water, and alcohol, are all fluids; but water and alcohol are also liquids. because they wet, or create moisture on bodies, which meronry and air do not do. Fluids are of two disneronry and air do not do. Fibrals are of two dis-tinctive kinds,—elastic and non-elastic; the former are comprised under the general term Pueumatics, and include all airs and gases; while the latter, which only include water and other aqueous fluids, are comprised under the general head of Hydrostatics and Hydrau-The terms elastic and non-elastic are only used here in a relative sense, and not absolutely, as all fluids are clastic more or less, water being compressible, although offering resistance.

ible, although onering remandance.

FLUGERSCENT RAYS, fin-o-res'-ent rais, certain rays
which exist beyond the blue end of the spectrum, inwishle under certain circumstances. If the prismatic spectrum be interrupted by a bath of esculin or sulphate of quinine, it will appear to be elongated at the blue end. The fluorescent rays are those which have the greatest actinic influence

(See HYDROFLUORIC FLUORIC ACID, flu-or'-ik.

FLUGRINE, flut-o-rine (in Chem.), symbol F, equiva-lent 19, supposed density 1.31, combining volume 2. Many unsuccessful attempts have been made to isolate this body. Several chemists have succeeded in ob-taining an impure form of it by using vessels of fluor spar, but its properties have nover been satisfactorily determined. Its compounds, however, so closely determined. Its compounds, however, so closely resemble those of chlorine, that but little doubt is resemble those of chlorine, that but little doubt is equi-soncest flute, &c.
entertained as to its being very similar to that body is its leading characteristics. Its principal compounds its leading characteristics. Its principal compounds is applied to any prefernatural fluid evacuation from are fluoride of calcium, or fluor spar, and hydrofluoric the body, but moss especially to those that proceed

scid (which see). It also combines with mest of the metals; also with boron, silicon, sulphur, silenium, and phosphorus. It exhibits no tendency to unite with oxygen. It is found somewhat sparingly in the mineral kingdom, in fluor spar, epatite, topaz, and a few other minerals. It also exists in the ashes of sea-plants, in sea-water, and in blood, milk, and the human teeth. with boron and silicon it forms two compounds, which are absorbed by water, giving rise, respectively, to fluoboric and fluosilicic acids.

FLUOR SPAR, flu-or spar, in Min., a mineral of great beauty, found in different parts of the world, but principally at Castleton, in Derbyshire, and Aston Moor, in Cumberland. It occurs in cubes and octahedra and concretionary masses, being most commonly of a violet-blue colour, but also yellow, green, purplish-red, and red. In its rougher forms it is often used as a flux, and the finer specimens are fashioned into cups and vases, under the name of Derbyshire spar. It consists.

chemically, of fluoride of calcium.

FLUTE, flute (Fr.), a popular musical instrument, themse of which, under various forms, may be traced to the most remote ages. Of its origin no direct account can be given : by the ancient poets, its invention was ascribed to gods and goddesses. Lucretius tells us that it derived its origin "from the breathing of the western winds over certain reeds." The sounds thus produced, he imagines, gave rise to the rural pipe, which, after undergoing many changes, has, by the ingenuity of later ages, been developed into one of the most clegant and fascinating instruments of which musical science can boast. In its primitive state, the flute was played like the modern flageolet, with a mouth-piece at the upper end; and from the shape of this mouth-piece, which resembled the beak of a bird, it received the name of \*hute a bec. In this form, with slight alterations, it continued until the beginning of the last century, when it was gradually superseded by the flauto traverse, or transverse flute, so called from its being blown at the side, and consequently held in a horizontal position. At its introduction, this instrument was about eighteen inches in length, and had but one key: even in this state it was a great improvement on the old flute à bec. Shortly after, a movable head-joint was invented, its length being increased, and more keys added; some flutes at the present time having more than a dozen keys, and few less than six. By means of these, they are enabled to execute any music, however chromatic, if within their compass, which extends from C below the treble to C in altissimo. Some few will go four notes lower, and au experienced player will reach E flat in altissimo. In December, 1832, a flute of an entirely new construc-tion was invented by Mr. Boehm of Munich: it however remained in obscurity until 1837, when it was adopted and introduced to the French professors by Mr. Camus; but they considered its adoption would be attended with too much trouble, in consequence of its having an open G sharp key. This, however, was be attended with too much trouble, in consequence of its having an open G sharp key. This, however, was soon after remedied by Mr. Dorus, who put a shaf G sharp key in its place. It now became universally adopted, and having, in its altered state, received the approval of the Royal Academy of Fine Arts in Paris, has been thoroughly established in France ever since. This instrument was first introduced to English players in 1841 by Mr. Clinton, who claims for it the following advantages: "perfection of tone," because every aperture is in its proper and ustural position: "equality of ture is in its proper and natural position; "equality of tone," because the holes are equal in size and distance; "superior quality of tone," because the bore of the instrument is not sacrificed to a false arrangement and size of the finger-holes; and "greater susceptibility of sweches," because every note is enlarged to the most available extent consistent with purity of sound. In the International Exhibition for 1862, Messra. Clinton & Co. exhibited a curious collection of flutes, showing the progress made in the manufacture of this instrument from the earliest times: they also exhibited an improved eight-keyed flute of their own construction, with new key mechanism, designed for tropical climates; as well as one which is termed the

Fly

from the bowels. It is frequently applied to diarrhose and dysentery was long known as the bloody flux. (See Diarrhose, Dysenvers.)
Fiuxes, fate'-ex, in Chem.—Fluxes are those compounds which are used by the chemist either as aids to

FLUXES, \*\*fakt'-ax\*, in Chem.—Fluxes are those compounds which are used by the chemist either as aids to the fusion of bodies, or as reducing or oxidizing agents. Fluxes may be divided into four classes,—reducing, oxidizing, double decomposing, and simple fluxes. The most important reducing fluxes are the carbonates of soda and ipotash, used alone or mixed with charcoal; cyanide of potassium, and black flux, a compound formed by throwing into a red-hot crucible a mixture of two parts of cream of tartar and one of water. The nitrates of potash and soda are the principal oxidizing fluxes, and a mixture of three parts carbonate of soda and four of carbonate of potash forms an excellent double decomposing flux. The simple fluxes act as purifying agents, removing and dissolving any mechanical impurity contained in the substance soted upon. Borax, microcosule salt, and powdered glass, are used as simple fluxes. The limestone used

any mechanical impurity contained in the substance sorted upon. Borax, microcosmic salt, and powdered glass, are used as simple fluxes. The limestone used in iron-smelting is a good example of a flux.

Fluxinous, full-shaus (from Lat. fluo, I flow).—The more common appellations by which the theory of fluxinous is known to the garrent reader or market. fluxions is known to the general reader or mathe-matical student, are the differential or integral calculus. The calculus of fluxions, which is one of the most important additions ever made to the abstract mathematical sciences, was invented about the middle of the 17th century. By the use of fluxions as an instrument of analysis, the science of geometry has been greatly enlarged; it has further rendered most efficient and incalculable aid in the investigation of the guiding principles of nature, more especially in establishing true theories of the definite motions of the stars and other heavenly bodies: astronomy without this theory would never have attained its present high position in the scale of human knowledge. In the beginning of the 17th century, the writings of Archimedes, and the works of the ancients on abstract science, greatly engaged the attention of the principal students of mathematics; the result was, that they thoroughly laid open the principles of Archimedes, which far surpassed those of the other ancient writers on this surpassed those of the other ancient writers on this subject. The celebrated Kepler greatly extended the theory propounded by the ancient philosopher, and the idea of fluxions became apparent, as Archimedes' theorems were of too limited a description to satisfy so bold an investigator. The theory of fluxions, or calculation of the velocity in uniform or variable motion, necessarily depends on that higher system of trigonometry which treats on drawing tangents to curves. The facility which this new portion of relegitive ages to the extension of geometry. notion of velocity gave to the extension of geometry, induced various foreign mathematicians, as Descartes, Roberval, and Fermat, to employ it in their researches. So very near did the last-mentioned approach to the true theory of the fluxional or differential calculus, that Laplace says he ought to be reputed its inventor. To find the real discoverer, however, we must look to two men, Newton and Leibnitz, who both claim the honour of its invention. The candidateship for that honour led to such a fierce discussion, that one need not be surprised at the high position which mathematical discoveries take; but from all the contingent circumstances of the case, and from Nowton having promulated and published his method the first, which he did in the year 1665, we will not err in laying the authorship of this system to him. The principles of Newton's theory may be thus described:—1. Supposing two quantities to have a given relation to each other (for example, the one to be always equal to the square of the other), and the rate of increase of one of them at any instant of time to be known; to find the rate of increase of the other at the same instant. These rates of increase were called the fluxions of its quantities; and the rules for their determination constituted the direct method of fluxions. or differential calculus. 2. The discoveries take; but from all the contingent circumand the rules for their determination constituted the direct method of fuzzions, or differential calculus. 2. The second part of this theory was exactly the reverse of the first; it is a problem in which the relations between the rates of increase of two quantities, which depended the one on the other, being given, it was required to discover the relation of the quantities. This was the inverse method, or integral calculus. In the application of algebra to the theory of curves, or curve lines, some

of the quantities under consideration are conceived as of the quantities under consideration are conceived as having always the same magnitude, as, for instance, the parameter of a parabola, and the axes of an ellipse or hyperbols; others again are indefinite in respect of negnitude, and may have any number of particular values; such are the co-ordinates at any point in a curve. This difference in the nature of the quantities has equally place in various theories of pure and mixed mathematics, and it naturally suggests the division of all quantities into two kinds; namely, such as are constant and such as are variable. A constant quantity always retains its same value, while a variable quantity varies its magnitude and value. These definitions have to be well remembered in working out the theories of the calculus of fluxions. According to theories of the calculus of fluxions. According to Newton's theory, a plane, curve, or line, may be con-ceived as generated by a point moving uniformly in the direction of some fixed line, and having at the same time a lateral motion with respect to this line, which is governed by some law dependent upon the nature of the curve generated. The part of the curve which is generated at any instant of time is called the fluent, and that infinitely small element generated during the next infinitely small and constant period of time is called its fluxion. If, in addition to the two motions already explained, we conceive the point to have a third motion at right angles to the plane of the other two, and also regulated by a law which must depend upon the nature of the curve, the generating point will describe a curve in space, which may be either a plane-curre, or one of double curvature. It may be thus easily surmised that by suitably regulating the laws of motion of the gene-rating point, any curve whatever may be described; it is also obvious from the theorem laid down, that, by the law of relation between the fluxions of the elements. the nature of the curve may be easily discovered. In the general deductions of mathematical science, if we the general deductions of mathematical science, if we suppose any line, which may vary according to some law, to move according to any fixed law, it will generate a surface, and the portion generated during any infinitely small portion of time will be the fluxion of the surface, while the whole portion generated will be the fluent. In a consequent manner, if a plain area move in any direction, the area being supposed to vary by a fixed have then will the infinitely amen value accounted in law, then will the infinitely small volume generated in an infinitely small portion of time be the fluxion of the solid, and the portion generated will be the fluent. In this system, any magnitude may be regarded as flowing ultimately from a point; a point in its motion may generate any into; a line in its motion may be made to generate any surface; and, lastly, a surface may generate any volume. It may be well said that the system of fluents and fluxions developed great credit on its inventor, as it is exceedingly ingenious, and has no superior in conveying an idea of the operations of calculus. The methods of integral and differential calculus, however, which are less complex and more calculus, however, which are less complex and more trustworthy, have now superseded them, although they are still employed in working out some problems. The notation of fluxions has been found to be their drawn that the still represent the still representation of the still represen back, and this is the main superiority of differentials and integrals over them. In conclusion, it may be stated, that the great facility which the theory of infinitesimals that the great menty which the theory of infinitesimals in fluxions gives to the applications of the calculus in the higher branches of geometry, and more especially to the doctrines of physics, is a high recommendation in its favour, and will be one of the strongest reasons for including the system of fluxions in the ranks of working mathematical theorems.

working mathematical theorems.

FLY, fit (Sax. fleoge), a name applied almost indiscriminately to all insects possessing wings; by many, however, restricted to the various species of dipterous insects. The fly is obsaracterized as possessing a pair of veined and membranous wings, with two movable bodies called balancers (kalteres), placed a little behind them. The mouth is formed of between two and six setaceous pieces of scaly texture, and these pieces are either inclosed in a prohoscis-like sheath, or covered by one or two lamina, which form it. The head is globular or hemispherical. The mouth is only formed for transmitting fluids, and is consequently very delicate in structure. The sucker performs the part of a lancet, and pierces the envelope of regetable or animal fluids, in order to allow of the fluid itself being transmitted up into the mouth of the insect. The antenne

## Fly-catchers

are united in front, and are approximate at the base. Above the true wings of the insect, and a little behind them, are the balancers, or halterer: these are almost membracous, and are furnished with two little knobs at their extremities, which are capable of dilation. The legs of this class of insects are long and slender; and the feet, it is well known, are furnished with skinny palms, to enable them to stick on glass and other smooth bodies by means of the pressure of the

atmosphere.

FLY-OATCHERS, fli-kātah erz (Muscicapidæ). — This very numerous family is widely diffused throughout both the eastern and western continents. As their name implies, they prey on insects, which they seize in name implies, they prey on insects, which they seize in mid-sir. They have the beak horizontally depressed, and armed with bristles at its base, with the point more or less decurved and emarginated. The value of the insectivorous family of birds to man is inosiculable. As Buffon truly says, "Vain would be the efforts of man to destroy or banish the clouds of flying insects by which he would be assailed. Man and quadrupeds cannot defend themselves against them. They attack with their stings; they oppose the progress of sulfiwith their stings; they oppose the progress of cultivation, and devour the useful productions of the earth. They infect with their excrement, or their eggs, all the provisions which are necessary to be preserved. Thus we find that the beneficent birds are not even sufficiently numerous in such climates, where, nevertheless, their species are by far the most multiplied." tuer species are by far the most multiplied." One of the best types of fly-catchers is that presented by the tyrant fly-catcher (Muscicapa Tyrannus, Briss.). This bird is peculiar to America. It is eight inches in length, and fourteen in extent of wing. The general colour of the upper parts is dark bluish-grey, Inclining to dull slate-black on the head, of which the central feathers along the crown form a gorgeous orange patch. It builds its nest on branches of trees; it is a rather bulky structure composed of twing and weel patch. It builds its nest on branches of trees; it is a rather bulky structure, composed of twigs and wool, or tow and cotton, and is very thick and snug. It scarcely deserves its ngly appellation, as it is only at those periods when its mate is attached to the nest by care for her little brood, that this fly-catcher is more fierce or tyrannical than any other. At such times, however, it cannot be denied that his conduct is rather outrageous. No matter the species of bird, no matter its size or strength, it is sufficient that it approaches any way near the tyrant's nest to excite his jealous rage, and out he sallies bent on instant satisfaction. It is said that engles and hawks may not with impunity approach this bird's nest, made sacred by his fledg-lings, and that, darting up into the air, it will launch down on to the back of its enemy, and there anchor in such a way as to make it a difficult matter to dislodge him. Only two small species of this tribe are found in this country. The European species are distinguished from any other by having much more slender bills, with shorter bristles at the gape.

Shorter bristles at the gape.

FLY, DEAGON. (See DIAGON-FLY.)

FLYING, fiving (Sax. fleegan, to fly), the power which many animals possess of raising themselves in the air, and in moving through it in various directions, supported by the atmosphere alone. (See Wing.)

FLYING, ARTIFICIAL, a species of propulsion through the air by means of mechanical or artificial contributes often attempted by men. The art of

contrivances, often attempted by man. The art of flying, if it can be called an art, has been often attempted: even amongst the ancients it was tried, and, we are informed, succeeded to some slight extent, Friar Bacon affirms, in his writings, that this art is not only possible, but he also informs us that he himself knew how to construct a machine in which a man, in a sitting position, might be able to transport himself through the sir like one of the feathered tribe. This through the air like one of the feathered tribe. This secret of Friar Eacon consisted of a very simple mechanical contrivance: it was a pair of globes made of hollow copper, exhausted of air, on which a chair could be supported, by which means a man could float in the atmosphere above the earth, and could buoy himself along. Another friar asserts the truth of this invention, or, at least, of one similar. Father Francisco Lana declares that a round vessel of plate-treas fourteen feet in diameter, weighing these cures. brass, fourteen feet in diameter, weighing three ounces per square foot, will only weigh 1,848 oz.; whereas a quantity of common air of the same bulk will weigh quantity of common air of the same bulk will weigh one of a membrae connecting its limbs with each 2,155? oz.; consequently, he deduces the fact that

## Flying Lemur

the globe will not only be sustained in the air, but that it will be capable of supporting a weight of 3733 oz.; and, also, that a globe of the same weight, but greater in capacity, would support a man. This, however, is a fallacy; for, from the fact of nature abhorring a vacuum, the globe would be crushed in by the superior force of the atmosphere. At many periods this subject has been taken up by philosophere, particularly in the reign of Charles II.; and it has been asserted that, at no distant period, by the march of improvement, flying in the air will be made as easy as walking on the earth. The truth of this assertion is, however, much earth. The truth of this assertion is, however, much to be questioned.

FLYING DEAGON. (See DRAGON.)

FLYING-PERGON. (See DRAGON.)

FLYING-FISH (Exocatus), a gen. of fishes that, on account of the extraordinary length and size of their pectoral fins, are enabled to spring from the water and support a kind of temporary flight through the sir. Their distinguishing features are—pectoral fins nearly equal to the body in length; head flattened above and on the sides; the lower part of the body furnished with a longitudinal series of carinated scales on each side; dorsal fin placed above the anal; eyes large; jaws furnished with small pointed teeth. Although some few naturalists have supposed that these fish possess the true power of flying, that is, by beating fish possess the true power of flying, that is, by beating the sir with their members, it is generally agreed that their large fins sustain them, parachute-wise, when they have leapt from the water. "I have never been able to see any percussion of the pectoral fins during flight, and the greatest length of time that I have seen this fish on the fin has been thirty seconds, by the watch; and the longest flight mentioned by Captain Hall is two hundred yards; but he thinks that subsequent obser-vation has extended the space. The most usual height of flight, as seen above the surface of the water, is from two to three feet; but I have known them come on board a ship at a height of fourteen feet; and they have been well ascertained to have come into the channels of a man-of-war, which is considered as high as twenty feet and upwards. But it must not be supposed they have the power of elevating themselves after leaving their native element; for, on watching them, I have often seen them fall much below the elevation at which they first rose from the water, but never in any one instance could I observe them rise from the height at which they at first sprang; for I regard the elevation they take to depend on the power of the first spring or leap they make on leaving their native element."—(Wanderings in New South Wales. Bennett.) Several instances are on record of the appearance of flying-fishes off the British coast, but the species is doubtful. It is probable that both the oceanic flying-fish (Exocatus volitans) and the Mediterranean flying-fish (Exocatus exilient) may have made their appearance in our seas. In the Gulf of Mexico are found some species with curious appendages or filaments attached to the lower

FLYING FOX (Pteropus rubricollis).—This animal belongs to the Bat tribe, of which it is the largest belongs to the Bat tribe, of which he has an employed species. It derives its common name of flying fox from a fancied resemblance of its head to that of a fox. It is found in the islands of the Eastern Archivalum where it occurs in great numbers. These pelago, where it occurs in great numbers. These animals are vegetarians in their diet, and commit great ravages in the gardens and plantations in the countries in which they abound. That they may occasionally live on animal food, is inferred from the fact that when in confinement, they have been known to devour the flesh of birds with great avidity. Like the rest of the bats, they are nocturnal in their habits, and, during the day, they remain suspended from the trunks of trees, usually affecting those of the fig genus for this clinging attitude, that any one not acquainted with the habita of the flying fox might readily mistake them for part of the tree itself, and only be undeceived when, dis-turbed by his presence, the seemingly long, pendent fruit suddenly assumed animal life and fluttered in masses round and round their roost.

FLYING LEMUR, or Colugo (Galeopitheess volums).

This is another curious species, which possesses the power of flying or lesping considerable distances, by

# Flying Squirrel

between the Quadrumqua and the Cheiroptera; to the latter, indeed, it has a great resemblance, insomuch as many naturalists of eminence have placed it in that order. It differs, however, from the bats in many respects, not the least important deviation of which is respects, not too least important deviation of which is the absence of opposable thumbs on all the feet, which are composed of five flagers united by a membrane. Notwithstanding this, it certainly hears, in its appear-ance and habits, a remarkable similarity to the flying for. In its diet, it is both carnivorous and frugivofox. In its diet, it is both earnivorous and frugivorous; feeding on birds and their eggs, insects, and fruits. It is found in the Indian Archipelago, living in the forests; seeking by night for its food, and remaining in a dormant state during the day, as already related of the flying fox. The natives occasionally eat this animal; but fastidious judges pronounce its flesh as being extremely nauseous.

FLYING SQUIREL.—By this name are known several species of aquirrels, the more important being the Tagram flying squirrel (Pteromys athmus), which is

Taguan flying squirrel (Pteromys alpinus), which is a native of India, where it is tolerably abundant. It has derived its name from the parachute-like appen-dage which it possesses. This consists of a broad fold of skin, stretching along each side of the animal, from the fore to the hind legs; and when it intends making a leap, it expands this curious membrane to the fullest extent, and is thereby enabled to jump a considerable distance, and is thereby endown to the head of distance, although always downwards, which, in fact, is all its so-called "flying" properties are capable of. It measures about three feet in length, of which it tail occupies more than half. Its general colour is chestaut, deepening into brown on the back and red on the sides; the abdomen, throat, and breast are covered with silvery greyish-white fur. The tail is greyishblack, becoming much darker towards its extremity. The assapan, or flying squirrel of America (Sciuropterus volucella) is another variety, agreeing with the above in its leading characteristics. There is also the polatouche of Siberia and the rusco of India.

FLY-WHEEL, in Mechan, a wheel with a heavy rim, placed on the shaft of any machinery put in motion by any irregular or intermitting force, for the purpose of rendering the motion equal and regular by means of its momentum. The rim of a fly-wheel, after a few revolutions, acquires a momentum sufficient to cause it to revolve with a velocity depending upon the resistance of the machinery. In all cases where a rotary motion is to be obtained from a reciprocating one by means of a crank, a fly-wheel is necessary to continue the motion at those two points of the revolution in which the crank lies in the direction in which the moving force acts. The momentum acquired by the fly-wheel urges the crank forward in the direction in which it was previously moving, and continues the rotation; thus making the motion equal and uniform.

FOCAL DISTANCE, fo-kell' (Lat. focus, a hearth), in Optics, the distance between the centre of a lens, or

concave mirror, and the point to which the refracted

or reflected rays converge. FOCUS, fo-kus' (Lat. focus, a hearth).—When light is reflected from regular curved concave surfaces to that all the rays converge to one point, that point is called the focus. The same term is applied to that point towards which rays of light converge after passing through a refracting medium, such as a lens. telescope, or other optical instrument, is said to be in focus when the arrangement of lenses is such that the object examined falls clearly and distinctly upon the retins of the observer. In the reflexion of heat, the point to which the rays converge is also called focus. In Geom. and comic sections, the term focus is applied to certain points in the parabola, ellipsis, and hyperbola, where the rays reflected from all these

curres converge and meet.

FODER, fod-der (Sax. fodder, or fother), in Agr., a serm used to express the food given to suimals; such

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#### Folk-lore

these terms are rather arbitrary, and the one is frequently used for the other. (See Paysiology.)

Francoulum, fe-sik-sims (from Lat.famus), in Bot.,

the Fennel, a gen. of the nat. ord. Umbellifere, formerly placed under Anethum species, namely, F. vulgare, the common fennel, and F. dulce, the sweet fennel, are much used in this country as potherbs, and for garnishing dishes. The former dishes. The former grows wild on rocks and walls, particularly near the sea; the latter is frequently regarded as a cultivated variety of the same plant. F. capensis is a common esculent at the Cape of Good Hope. The term is derived from the Latin



PENNEL.

word for usury, because the seed yields, or is returned

with, great increase.

with, great increase.

Fog. (See Mist.)

Fog. (See Mist.)

Fog. Siewals, fog sig'-nüls (Dan. fog; Fr. signal, signal), are those used at sea in order to prevent colisions between vessels when any thick fog or mist is hanging over the water. They usually consist of blowing a horn, beating a drum, ringing bells, or firing off guns at stated intervals. The Admiralty has fixed rules for ships belonging to the navy to adhere to duving any fog, and certain known signals have been during any fog, and certain known signals have been devised in order to let the other vessels of a fleet know what tack an approaching vessel is on. At the present time, by reason of our extended commerce, the Channel and other maritime highways are much crowded, and it would be as well for the merchant service to lay down a plan of rules somewhat similar to those used by the Admiralty. As the generality of vessels in the present day are propelled by steam, it would not be add plan to use the steam-whistle, as is done on rail-ways; and different durstions of the whistle might express the different tacks on which a vessel might be. Ref. English Cyclopedia.

FOIL, foil (Fr. feuille, a leaf), a term applied to a thin sheet of metal placed beneath transparent jewels thin sheet of metal placed beneath transparent jewens to heighter their colour and improve their briliancy; also to those sheets of tin amalgam placed behind currors to make them reflect perfect images. They are made of tin, copper, and sivered copper, and are much used in imitations of precious stones. and are much used in imitations of precious stones. Coloured foils are made by coating the white with any varnish of the required tint. The sheet-lead which is used for the lining of tea-chests is a species of foil, and the Chinese purchase about 4,000 tons of lead annually from England for this purpose.

FOLL. (See FERGING.)

FOLLO, fo'-le-o (Ital., a leaf), as used in Book-keeping, denotes a page, or rather the two right and left-hand pages of an account-book, which are reckoned as one. In lat, it is used to denote the size of a volume of

one. In Lit., it is used to denote the size of a volume; thus a folio volume, or a book in folio, is one in which the sheet is only folded in two, each leaf making half a sheet.

FOLK-LORE, foke'-lore (Ang.-Sax.), is a word which has been recently applied, in the English language, to the ideas, prejudices, and superstitions—such as legends, and other similar stories—of the lower orders. The term is generally applied to all those customs and old habits generally handed down from father to son old habits generally handed down from nature to som old retired country villages and parishes; and the folk-lore of England, Scotland, Ireland, and Wales, would form sufficient matter to fill more than a volume. The fairy takes of the Irish, the "second sight" of the Scotch, the time-honoured old customs of the English, and the legends of the Weish, are so many instances of what is meant to be designated by "folk-lore." Old Restate and Christians correspondents may also be recorded. serm used to express the food given to suimals; such as the stems and leaves of plants; in fact, whatever is given as ordinary food is termed fodder, white corn, cats, beans, &c., are termed solid food. In some parts, hay and straw mingled together is peculiarly denominated fodder.

FGTUS, fe-lus (Lat., from feo, I bring forth), in Physiol., is applied to the child in the uterus from the fifth month of pregnancy to the time of birth. Previous to that time, it is commonly salight the embryo; but the weather are examples of folk-lore. In some parts

## Folkmote

of the country, if the salt at the dinner table is seen to be damp, people immediately assert that there is going to be rain; if the glow-worms are seen shining at night, "there will be wet ere morn;" if woodpeckers utter their harsh cry, "there will be a shower soon." With regard to gardening operations, there is an old rustic prophecy,

"When elm-leaves are as big as a shilling, Plant kidney-beans, if to plant 'em you're willing; When elm-leaves are as big as a penny, You must plant kidney-beans, if you mean to have any.

On New Year's day, old gossips relate, that if the first on New Years any, our goes person, you will have good luck for a twelvemouth; if a female, the reverse. In illustrating particular periods in history, folk-lore is sometimes a valuable adjunct.

FOLKMOTE, or FOLKGEMOTE, folk-mote (Sax., an assembly of the folk or people), in Anglo-Saxon times,

was applied to certain assemblies of the people; but respecting the exact nature of which, antiquarians are not agreed. According to some, it was a kind of annual parliament or convention, assembled on every May-day, for considering and ordering the matters of the realm. Others think that it was not essentially distinct from the shiremote, or common general meeting of a county; while some speak of it as an inferior ordinary court, held once a month, to settle minor disputes among the people. According to Kennet, it was a common council of all the inhabitants of a city, town, or borough, convened together in the motehail

FOLLICLE, fol'-le-kl (Lat. folliculus), in Bot., a superior one-celled, one- or many-seeded fruit, dehiscing by the ventral suture only; and consequently one-By the latter character it is known at once valved. from the legume, which opens by two sutures, and is two-valved; in other respects, the two fruits are alike. Examples occur in the columbine, larkspur, hellebore,

and aconite.

FOMENTATION, fo-men-tai'-shun (Lat. fomentatio, from force, I buthe), in Med., is the application of leat and moisture to a part, by means of flamed or other substance wrung out of hot water, in order to relieve pain or to stimulate the surface. Sometimes the water is medicated with various substances, and the water is medicated with various successionally other liquids, as oil or milk, are employed. Care should be taken to wring the cloths well, so as to prevent the fluid from running about the patient and rendering him uncomfortable. They should be and rendering him uncomfortable. They should be applied as warm as they can be borne, and renewed as soon as they begin to feel cold. To enable them to retain the heat still longer, they are often covered

externally with oiled silk.

FONT, font (Lat. fons, a fountain), a stone vessel in the form of a large bowl or basin, resting on a pedestal, and used for the reception of water required in the administration of the secrement of baptism. The pedestal is perforated to receive a pipe, by which the consecrated water may be carried off at the conclusion of the ceremony. The proper position for the fort is at the west mony. The proper position for the font is at the west end of the church, opposite the principal porch or entrance, which is to be found most frequently on the south side of the nave in parish churches, though in some instances it is situated on the north. Baptism was administered in the early churches in a part that was separated from the nave for that especial purpose by a purty-wall or screen, or in a building that was entirely distinct from the church itself. These were called buptisteries (see BATTISTERY), and contained a marble basin of great size in the centre, in which the candidate for baptism was subjected to total immersion. Subsequently, when this practice, which must have been attended with considerable danger in cold climates, attended with considerable danger in cold climates, particularly to infants, was abandoned for that of sprinkling those who were brought to be baptized with a few drops of water only, the font was introduced to take the place of the large laver of the baptistery, although it was still sufficiently large to admit of the total immersion of an infant, should this be desired by its parents. It was not then so necessary to have a distinct building in which thesefont might be placed, or its perents. It was not then so necessary to have a kinde of food, Potassium is found in various distinct building in which thegiont might be placed, or to have a portion of the church separated from the rest for its reception; and it was therefore put in the body food, but also from drinking-water, which usually food, but also from drinking-water, which usually

## Food and Drink

of the building, at the lower end of the nave. Examples occur, however, in some of our cathedrals and old churches, in which the font is placed in a baptistery divided from the body of the building; and in some of our modern ecclesiastical structures, it has been placed in an inclosure formed by low walls, or in a chamber especially designed and constructed for it in the basement of the belief that the constructed for it in the basement of the belief the constructed. ment of the belfry tower. The fonts that were placed in churches built in the Anglo-Saxon and Anglo-Norman atyles of architecture, were generally circular or square, supported on a short but massive pedestal, cylindrical in form. In some examples of square fonts, the lower corners of the block are cut away in such a manner that the faces of the sides assume the form of a semicircle. The bowl itself, and sometimes the stem, was often adorned with sculptured figures, acroll-work, or interlaced fret-work. The fonts of the three periods of English Gothio architecture are more frequently octagonal in form, and more richly carved with figures and emblems placed in sunken panels or niches, and the angles of the pedestal are adorned with buttresses. the angles of the pedestal are adorned with buttresses. They are also generally raised on a platform, formed of two or three steps. Those of the Perpendicular, or third Pointed style, were generally surmounted by a lofty octagonal canopy in the form of a spire, which was formed of wood, and magnificently carved and embellished with crockets at the angles, and a rich finial at the summit. This custom of covering fonts originated about 1250, in an order that was issued to the clerey to provide covers for these yeasels, which the clergy to provide covers for these vessels, which were to be kept locked. In a few of our churches the were to be kept locked. In a tew of our entrenes the fonts are made of lead, cast in a mould; many of these are covered with figures in bas-relief. They are supposed to have been executed by workmen of no ordinary skill, about the beginning of the 12th century.—Eef. Paley's Illustrations of Buptismal Fonts. FONTSWALET, font-te-vool, in Ecclesiastical History, was the name of a monkish order connected with the Repedictines, which areas in the 12th century.

the Benedictines, which arose in the 12th century, and was named after its first monastery. Its founder was Robert d'Arbrissel, and it comprised both monks and nuns; but had this peculiarity, that the latter had the pre-eminence, and the whole were subjected to an abbess, in imitation, as he said, of Christ's commenda-tion of the apostle John to the matronage of the Virgin. This order had several houses in England, and

Virgin. This order had several houses in Engianu, and at the time of the French revolution they had about fixty houses in France. FOOD AND DRINK, food (Sax. food, food), those solid and liquid substances which are used either for sustaining animal life or for the purpose of reproducing the ever-wasting tissues and fluids of animal bodies. Of the elementary bodies, only a small proportion enter into the constitution of animals; and the sub-stances included in this small proportion are the only ones required to be present in food and drink. Out of about sixty elements, only oxygen, hydrogen, nitrogen, carbon, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, iron, and fluorine, are absolutely necessary. Albumen, fibrine, and caseine, which occur both in animals and vegetables, caseine, which occur both in animals and vegetaries, together with vegetable gluten, furnish oxygen, hydrogen, mitrogen, and carbon. Animal flesh, eggs, milk, corn, and various other vegetable productions, contain one or more of these principles. Food concontain one or more of these properties extended as large proportion either of sugar, starch, or organic acids, introduces carbon, hydrogen, and oxygen largely into the system. Oleaginous alimentary substances contain carbon with a little oxygen and substances contain carron with a first dayger and hydrogen; this class of substances includes iat, suct, butter, oily seeds, such as nuts, and fatty foods, such as liver, &c. Flesh, blood, and bones, used as food, supply phosphorus to the system; the flesh of fishes is particularly rich in phosphorus; and in the shape is particularly rich in phosphorus; and in the shape is particularly rich in phosphorus; and in the shape of phosphates, it exists in the juices of many edible vegetables. Sulphur is introduced into the system from the fibrine of flesh, from albumen, from the caseine of milk, gluten, &c. Chlorine and sodium exist in nearly every variety of animal food, and, in the shape of common salt, are taken separately with nearly all kinds of food. Potassium is found in various kinds of food both animal and vecetable: in milk: in

# Food and Drink contains sulphate and carbonate of lime in solution

Magnesium is generally found along with calcium, and traces of fluorine have been observed in milk, blood, &c. These simple bodies are, however, not capable of being directly assimilated and converted into tissue; they must be previously in combination; and their assimilation depends upon certain chemical decompositions and physiological processes. The number of elementary substances in combination differs : thus, water contains two elements,—oxygen and hydrogen; sugar, starch, fat, &c., contain three; caseine of milk contains five; and albumen and fibrine contain six. Baron Liebig, who has given much attention to this subject, has divided all kinds of food into two classes, those substances which do contain nitrogen and those which do not. The first class, which is sometimes called nitrogenous or albuminous, is useful in forming blood, flesh, &c.; it is, in fact, nutritious food. The second, or non-nitrogenous class, assists the respiratory organs. Thus, in very cold climates, where more exercise is required in order to sustain the vital heat, more oxygen is consumed, and consequently more carbon is required in the food. Hence, it will be observed, that in such countries as Siberia, Lapland, &c., large quantities of non-nitrogenous substances, such as fat, oil, &c., are used by the inhabitants as food. In the temperate zone a moderate mixture of nitrogenous and non-nitrogenous food is used; while, nitrogenous and non-nitrogenous food is used; while, in the tropics, where the system requires oxygen in particular, fruits and regetables form the principal food. Aithough the theories of Liebig have not remained undisputed, his works on the subject are considered of very high value. (See Liebig's Researches on the Chemistry of Food.) In the preparation of food for eating, much depends upon the way in which it is cooked. As all the nutritious juices of meat are soluble in cold water, it is necessary, when preparing boiled food, to piace the meat in boiling water in the first place. This coagulates the albumen on the surface: thus forming a crust or shell, which prevents first place. This coagulates the albumen on the surface; thus forming a crust or shell, which prevents the secape of the nutritious juices. If, however, the object is to make soup, the meat should be put into cold water, and gradually raised to the boiling-point, In roasting and broiling meat, the first application of heat should be vigorous and rapid, in order to coagulate the albumen and form a crust, and so retain the miner are in boiling. In the research of versions the juices, as in boiling. In the process of roasting, the cellular tissue is converted into soluble gelatine, and the fat is melted out of its component cells. Baked meat is less digestible than either roast or boiled, as it contains more empyreumatic oil. Frying is the most unwholesome form of cooking, as it is mostly performed with the assistance of heated oil or fat, which is decomposed during the operation. Smoking, pickling, and salting meat, not only harden the animal textures, but, in the case of salting, the food is rendered less nutritions, as a large quantity of albumen, soluble phosphates, lactic scid, potash, creatine, and creatinine, are abstracted in the brine. Very few togetables are roasted; they are, as a general rule, boiled. Those which contain saccharine matter, such as carrots, beetroot, parsnips, &c., are best cooked by steam, as boiling water dissolves out a large quantity of their nutritions ingredients. Vegetables, however, which contain much starch, as potstoses, should be boiled. By boiling, the granules of the starch are ruptured and partially dissolved, and any volatile oils which may be present are expelled. All kinds of flesh are not equal with regard to their nutritive value. Veal, for instance, is totally different from beef. It contains a smaller quantity of the alkalies, and there is 15 per cent. more phosphoric acid than is necessary for the formation of salts; it contains, also, little of the fibrine of flesh, and proportionately more of the fibrine of blood, which is less digestible than the former. Veal is rich in gelatine, which is not nutritious, and seldom contains any quantity of fat: it also tity of their nutritions ingredients. Vegetables, how former. Veal is rich in gelatine, which is not nutritions, and seldom contains any quantity of fat: it also contains very little iron. In all these points it is also reverse of beef. Hard-boiled eggs have little or no nutritive power, and the same may be said of boiled fish, the soup of which is generally thrown away. In order to make up the necessary deficiency of nutritive matter in veal, eggs, and fish, vegetables should be taken with them. Celery contains 18 per cent., soft the intervent of cold; but this mode of preserva
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## Food, Preservation of

dry weight of salts, alkalies, and alkaline earths. Vegetable food in general contains a large proportion of iron. In the human body, iron is present in the blood, the bile, and other places. The presence of iron determines the colour of the hair, and persons of a sanguine temperament have more iron in their bodies than those of a lymphatic nature. When the blood is deficient in iron, the physician prescribes either iron, steel, or chalybeate waters. The presence of this metal is therefore necessary in food: Prolonged absence from fruits and aucoulent vegetables brings on scurry. The absence of the acids which they contain produces this effect; thus the actor which they contain produces this circle; thus lime-juice is used by sailors with good effect on long journeys. Amongst the condiments used for flavouring food, are mustard, cay sone pepper, black pepper, and various spices. They owe their action to the presence of a volatile oil. The volatile oils of fennel, thyme, or a volatile oil. The volatile oils of tennes, trying-parsicy, anise, caraway, horseradish, mustard, and water-cress, stimulate the system, but do not incorpo-rate themselves. Condiments and sauces (which are usually fluid mixtures of condiments), in time, generally weaken the organs, which they at first stimulate. The only exceptions are salt and vinegar. Dr. Beaumont, a surgeon in the United States army, about forty years ago, made some interesting experiments upon a Canadian who had been shot in the left side. In the process of healing, an aperture was left, by means of of healing, an aperture was left, by means of which Dr. Beaumont was able to observe everything that took place in the atomach. According to his observations, vinegar and mustard, when used together, bear some analogy to the gastric juice. (See "Experiments and Observations on the Gastric Juice, and the Physiology of Digestion," by Dr. Beaumont.) Drinks for the most part are simply liquid food. They may be divided into the following classes:—1. Mucilsginous, farinaeous, or saccharine drinks; such as barley-water, and sucré, &c. They are a little more nutritive than drinking-water.—2. Aromatic or stringent drinks; such as tea, coffee, chocolate, cocos, &c. They all contain principles which act with a slightly exhibitating action upon the nerrous system: chocolate and coeoa contain oil and starch.—3. Acidulous drinks; such as lemonade, ginger beer, raspberry vinegar, &c. They allay thirst, and form cooling antiscorbutic drinks.—4. Drinks containing calculus. and form cooling antiscoroute drinks.—a. Drinks constaining gelatine and ozmazome, including broths and soups. These, when properly made, ought to contain all the soluble constituents of the substance from which they are prepared.—5. Emulsive or milky drinks; such as animal milk, cocos-nut milk, almond milk, &c. Animal milk contains all the essential ingredients of Aumai mis Courses at the cessessa ingresses food; the others are slightly nutritive.—B. Alcoholic and other intericating drinks, including malt liquor or beer, wines and spirits. (See article on Deinks.)—Ref. Percira's Treatise on Food and Diet.

FOOD, ADULTERATION OF, the act of corrupting food by a foreign mixture, or of endeavouring to make inferior qualities of food pass for more than their intrinsic value, by their resemblance to something better. The adulterations practised differ in king as well as degree. One form of adulteration consists in the addition of substances usually of a greatly inferior value, for the sake of bulk and weight. In this case, the choice of the adulterating substance depends upon its chespness and fitness for the particular adulteration required. This description of adulteration is the one most frequently practised. A second form of adultera-tion consists in the addition of colouring matters, with a view to heighten the colour and improve the appearance of the article, as well as to conceal other forms of adulteration. This form of adulteration is the most objectionable of all, as several substances are employed for giving colour, which are not only nurtful, but in some cases poisonous. Various preparations of lead, copper, mercury, and arsenic, are used for this pur-pose. Another kind of adulteration consists in the mixture of substances, for the purpose of imparting

## Fool, Court

#### **Foraminifera**

tion is necessarily very limited in practice. The second method is by keeping the food in air-tight vessels. This plan, although expensive, is the most efficacious, and the one most generally adopted: several great improvements have been made upon it in late years. The usual method of keeping meat for any length of time is by salting it; but, as has been pointed out in the article upon Food and Drink, the operation of salting deteriorates the nutritious power of the food. (See ANTISEPTICS.)

FOOD, COURT. (See COURT FOOL.)
FOOLS, PRAFT OF, fools (Fr. fol, fou), was the name of a festival regularly celebrated, with the most absurd of a results regularly cerebrated, with the most gostra ceremonies, both by clergy and laity, in several countries of Europe, from the 5th down to the 16th century, It is said to have been introduced in imitation of the Roman Saturnalia, and its celebration took place about the same time, the great day being New Year's day; but the eeremonies were often continued from Christ-mas to the last Sunday of Epiphany. At first only the boys of the choir and young sacristans played the principal part in them; but afterwards all the inferior servants of the church, and even laymen, engaged in them; while the bishop and other clergy formed part of the audience, A Bishop of Unreason was appointed, the forms and coremonies of the Church were travesticd, indecent songs were sung, dancing was carried on, and all manner of fooleries enacted. The ass often played an important part in the profeedings, being sometimes led towards the altar and having hymns sung in its honour. The feast of fools was condemned by several popes and bishops in the 16th century, and the council of Basle, in 1435, expressed its detestation of this and account of the features, but it continued to be observed. several other festivals; but it continued to be observed

in many places down to the time of the Reformation.

FOOLS' PARSLEY. (See ÆTHUSA.)

FOOT, foot (Ger. fues, Lat. pes), in Anat., is that part of the lower extremity below the leg with which we stand and walk. It is composed of three series or groups of bones,—the tarsal, or bindermost; the metatarsal, which occupy the middle portion; and the phalanges, which go to form the toes. The tarsal bones are seven in number. Above, they are connected with the tibia and fibula bones of the leg, and below form the heel and the hinder part of the instep. They are the astragalus, which articulates with the tibia and tibula; the os calcis, or bone of the heel; the os naviculars, or scaphoid bone, on the inner side of the foot, articulating with the astragalus; the os cuboides, on the outer side of the foot, articulating with the os calcis; the three ounciform or wedge-shaped bones (the internal, middle, and external) in front of the scaphoid bone, near the middle of the foot. The metatareal bones are five in number, and belong to the class of long bones. They are connected posteriorly with the tarsal, and anteriorly with the philangeal bones. One is attached anteriorly with the phalangeal bones. One is attaced to each of the coneiform bones, and two to the os cuboides; and they diverge slightly outwards as they proceed forward. Their auterior ends form the bulls of the toes. The first metatarsal bone is the shortest and strongest, while the second is the longest,—the others all decreasing in length according to their distance from it. These bones form the anterior portion of the instep. The phalanges, or bones of the toes, are or one instep. The phalanges, or bones of the foes, are fourteen in number, three to each toe, except the great one, which has only two. The upper ones, which are the longest and largest, are named the metatarsal, the next the middle, and the most anterior the ungual phalanges. The bones of the foot, more particularly those that compose the tarsus and metatarsus, are those that compose the tarsus and metatarus, are firmly connected tegether, so that they are not liable to be displaced; and those parts where they articulate with one another being covered with a tolerably thick layer of highly elastic cartilage, they possess a consi-derable degree of elasticity. They are bound together

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calcis, by which the foot is rolled mwards and outwards; (3) between the first and second range of tarsal bone admitting of a very slight motion, by which the arch of the foot may be somewhat increased or diminished. Besides these there are the less-complicated movements of the metatarsal and phalangeal bones. The foot, natuof the metatarsal and phalangeal bones. The foot, naturally a beautiful structure, is usually so much interfered with in civilized life, as to be deprived of much of its beauty, and even of its utility. Its movements are impeded by its being confined in tight-fitting boots; while, in place of the boots being conformed to the shape of the feet, the feet are made to conform to the shape of the boots. The consequence of which are corns, bunions, cold feet, and a number of other evils, from which so many suffer in the present day. Attenton has lately here called to this subject by Professor trom which so many suffer in the present day. Attention has lately been called to this subject by Professor Meyer, of Zurich, who has published a pamphlet, entitled "Why the Shoe pinches; a contribution to applied Anatomy," which has been translated into English, and is well worth a perusal.

Foot, in Greek and Latin poetry, is a metre, or measure, composed of a certain number of long and short syllables. Some are dissyllabic. consisting of

measure, composed of a certain number of long and short syllables. Some are dissyllabic, consisting of two feet, us the spondee, iambus, trochee; and some trisyllabic, as the dactyl, anapest, tribrach. These are what are called simple feet. There are others, consisting of four, five, or six syllables, which are reckoned double or compound feet, but which are commonly resolved into single feet. A verse is frequently named from the number of feet which it quently named from the number of feet which it contains, or from the foot which prevails in it; as, heramater, containing six feet; pentameter, containing five; dactyllic, from the dactyl being the prevailing foot; ismbic, the ismbus.

FOOT-BALL, an old English out-of-door exercise or game, which used at one time to be a national pasgame, which used at one time to be a national pas-time; now, however, it has nearly fallen into disuse, except in some parts of the country. It is played with a distended ox-bladder, lightly covered with dressed leather, and so sewn up as to retain its elasticity. Two different sets or sides of players are chosen, and there is a goal marked out on the extremity of the space allotted to each side. When all is ready, "play" is called, and the ball thrown up between the two sides. The object then of each is to endeavour to send this ball through the boundary or goal of their adversaries' ground, by means of vigorous kicks. The ball can never be sent forward fairly unless kicked, and this is one of the most stringent rules of the game. On the Scotch border it is still played annually by the men of Scotch forder it is still played annually by the men of different clans; and it is one of the most interesting of sights to see the two parties engaged in that amicable contest. From the fact of kicking being one of its strongest characteristics, this game is generally productive of broken shins and other contusions. It is still a favourite pastime in the large public schools of England.

FORGE, for of (Fr. fourrage), a military term applied to hay, oats, corn, barley, grass, clover, and other means of sustenance for horses brought into

camp by troops with that object.

FORAMEN, for d-men (Lat., a hole), in Anat., is a term applied to certain holes or openings of the human body, more particularly of the skeleton; as the various foramina of the skull. The foramen ocale is a passage or communication between the two auricles of the

heart in the fœtus.

heart in the fætus.

FORMINITERA, fo-rå-me-nif'-e-rå (Lat. foramen, an oriflee; fero, I bear), the name given by d'Orsigny to a group of minute organisms having calcareous shells, which are pierced with numerous holes or foramina. Until recently, the Foraminifera were regarded as microscopic cephalopods, but they are now looked upon as protozos. The pores are for the protrusion of delicate filaments, by the aid of which locomotion and perhaps nutrition are performed. Hecent Foraminifera are beautiful microscopic objects; they are procured by dredging, or sometimes from the sand of the sea-shore. In the fossil state these tiny shells occur in rocks of all derable degree of elasticity. They are bound together in various directions, by a number of ligaments, one of the principal of which is the plantar ligaments, one of great strength, and passes from the under surface of the heel-bone, near its extremity, forward to the lends of the metatarsal bones. The movements of the foot, which are permitted by the connecting ligaments, are effected by a variety of muscles. The principal movements are, (1) that at the arble, formed by the tibia and fibula with the astragalus, by which the foot is bent and straightened; (2) between the astragalus and os

## Forbes Mackenzie Act

ranean regions, and of which the pyramids of Egypt are principally composed, agree in essential struct with those of the Foraminifera.

FORESS MACKETZIE ACT is the name popularly given to act 18 & 17 Vict. c. 67, entitled, "An act for the better regulation of public-houses in Scotland," and which is so called from the late Mr. Forbes Macketzie, M.P., the member by whom the bill was introduced. Some of the enactments of this statute are very stringent; but there can be little doubt that, as a whole, it has been attended with beneficial results. No excisable liquors are sliowed to be sold on Sunday, or after eleven o'clock at night on any other day, except in the case of inn and hotel keepers, to bond fide travellers or persons lodging in their house. Grocers and provisiondealers, who may be licensed to sell excisable liquors, are prohibited from allowing it to be drunk upon the premises; and in the same way all public-house keepers who sell liquors to be consumed on the premises are who sell future to be consumed on the premises are not allowed to sell groceries or other provisions to be consumed elsewhere. In and hotel keepers, and keepers of public-houses, are prohibited from selling or giving out any liquor before eight o'clock in the morning; but grocers and provision-dealers, having a spirit license, are allowed to sell spirits after six o'clock. 1859, a royal commission was appointed to inquire into the working of this act, and after collecting a great amount of evidence, they expressed themselves generally in favour of the act, as having been productive of beneficial results, but suggested a number of alterations, partly with a view to enabling the police to carry out its provisions with greater efficiency, and partly to lighten some of its more stringent enactments.

Ighten some of its more stringent enactments.

FOREIDEN FRUIT. (See CIRUS.)

FORCE, FORCES, fors (Fr.).—In Mech., force is a term applied to any cause which is capable of producing motion in matter, or of stopping or altering its direction when produced. Every visible particle of matter is under the influence of several forces, exerted upon it both by distant and by seincent particles, and upon which it acts in return; for the action of one body on another is always accompanied by a re-action of the latter upon the former, of the same intensity, in an opposite direction. The motions observed in some bodies are owing to these forces, and upon their balance the apparent state of rest in others is de-pendent, According to Sir John Herschel, the origin of the idea of force must be referred to the conpendent. According to Sir John Herschel, the origin of the idea of force must be referred to the consciousness of each individual. He says: "We are conscious of a power to move our own limbs, and by their intervention, other bodies; and this effect is the result of a certain inexplicable process, which we are aware of, by which we exert force; and even when such exertion produces no visible effect (as when we press our two hands violently together, so as just to oppose each other's effort), we still perceive, by the fatigue and exhaustion, and by the impossibility of maintaining the effort lone, that something is going on within us, of effort long, that something is going on within us, of which the mind is the agent, and the will the determining cause." In the case of force exerted by the right ing cause." In the case of force exerted by the right hand, and met by an equal force from the left, the two, acting in opposite directions, exactly neutralize each other, and may be said to be in equilibrio. and the effect is called pressure. As this force is found to have its proximate seat in the muscles of man and other animals, it is called muscular or animal force. This force can be communicated to inanimate matter, as when a stone is projected from the hand. Muscular force may also be concentrated in the same mass by continued action. per concentrated in the same mass by continued action, as when a stone, by means of a sling, is continuously acted upon by the same arm, it will at length be projected with an intensity of action capable of producing very violent effects. Force transferred to moving masses of matter is called mechanical force, and by multiplying the quantity of matter in a body by its by multiplying the quantity of matter in a body by its velocity, we arrive at its momentum, or the quantity of force which it is capable of exerting upon other bodies opposed to it. The investigation of the laws of, motion constitutes the province of Dynamics. In mechanics, the term decomposition of forces significantly and the control of the contro in mechanics, take term decomposition of forces. Any force may be decomposed or resolved into a number of forces, and the original force will be equal to the resultant of those forces. Thus, if the given force be represented by the diagonal of a parallelogram, it can

## Forceps.

be resolved or decomposed into two forces of like intensity and direction, represented by the two sides of the parallelogram. Any one exerting muscular or animal force is soon made conscious that it may be opposed by other forces appertaining to inanimate matter. In lifting a lump of metal, stone, or other heavy substance from the ground, an opposing force is experienced, which is called weight or gravity. On pressing with the arm on a strong spring, another op-posing force is observed, called *elasticity*. Some forces possing force is observed, called tracticly. Some forces cause masses of matter to approach and others to recede from each other, retaining them in their second position against an opposing force: the former are called forces of attraction, and the latter of repulsion; thus, gravity is a force of attraction, and elasticity as force of repulsion. In electricity and magnetism the forces of attraction and repulsion are also shown. Polar forces of attraction and repulsion are also shown. Polar forces are those which are conceived to act in opposite directions at the extremities of the axes of molecules or of masses of matter. The forces mentioned above are usually termed external forces, for they act upon matter at sensible distances; but there are others which act only upon its constituent molecules at insensible distances: these are frequently called internal or molecular forces; they include homogeneous attraction or cohesion, the universal antagonist of which is the repulsive force of heat (which see). Another attrac-tive force is that of heterogeneous affinity, by which a piece of metal or glass is wetted when dipped into water. Heterogeneous attraction is seen in its highest degree in chemical affinity, an inquiry into the laws of which force constitutes the chemist's peculiar province. (See ioree constitutes the chemist's peculiar province. (See AFFINITY.) The correlation of the physical forces is a very important principle in natural philosophy, which has of late years been particularly enunciated by Mr. W. R. Grove, the inventor of the voltaic battery which goes by his name. Many philosophera had previously asserted that all the forces of nature were intimately connected, and dependent upon one common principle; but the correlation, or necessary mutual dependence and commutability of each of the physical forces upon and into any other, or into all, and of all, reciprocally into each other, was, at its original enunciation, the particular theory of Mr. Grove. His doctrine is, "that the various affections of matter which constitute the main objects of experimental physics,—namely, heat, light, electricity, magnetism, chemical affinity, and motion, are all correlative, or have a reciprocal dependence; that neither, taken abstractedly, can be said to be the essential cause of the others, but that either may produce or be convertible into a ible into any of the others: thus, heat may, mediately or immediately, produce electricity; electricity may produce heat; and so of the rest, each merging itself, as the force it produces becomes developed; and that the same must hold good of other forces, it being an irresistible inference from observed phenomena, that a force cannot originate otherwise than by devolution from some pre-existing force or forces."-Ref. Correlation of Physical Forces, by W. R. Grove.

FORCE AND FEAR, in Law, is a term applied to such restraint or interference with the freedom of action of an individual as will render an act performed by him, when in that condition, null and void. It is, therefore, not every kind of restraint that will have this effect in law. In fact, it must be of such a kind as may reasonably be supposed to have influenced his conduct; and hence, in questions of this kind, the age, sex, and other circumstances of the party, have to be taken into account. A contract entered into through force and fear is invalid. "Ff aman," says Blackstone, "through fear of death or mayhem, is prevailed upon to execute a deed, or do maynem, is prevailed upon to execute a deed, or do any other legal act; these, though accompanied with all other the requisite solemnities, may be atterwards avoided." But "a fear of battery, or being heaten, though never so well grounded, is no duress; neither is the fear of having one's house burned, or one's goods taken away and destroyed; because, in these cases, should the threat be performed, a man may have satis-

faction by recovering equivalent damages."

Forcurs, for eps (Lat.), in Surg., is the name given to certain instruments of various shapes, according to the purposes they are intended to serve; but the principle of all is that of a pair of pincers with

#### Forcible Entry

two blades, either with or without handles. They are much used in surgery, especially for taking hold of substances that cannot be conveniently laid hold of with the fingers. Certain kinds are used for tooth-drawing; others for securing the mouths of arteries, in order to their being tied; others are used in dissecting; others in lithotomy; and others in midwifery, for aid-ing delivery in difficult cases.

FORCIBLE ENTRY, or DETAINER, in Law, is an offence against the public peace, which is committed by violently taking or keeping possession of lands and by volefitly taking or keeping possession of lands and tenements with menaces, force, and arms, without the authority of law. This was formerly allowable in certain cases; but being proved very prejudicial to the public peace, it was found necessary, by several statutes, to restrain all persons from the use of such violence methods, even in doing themselves justice, much less if they had no justice in their claim; so that, now the only entry allowed by law is a peaceable one. now, the only entry allowed by law is a peaceable one.

FORCING, for sing (Fr. forcer, to force), a term applied to the system by which the growth and maturity of fruits, vegetables, and flowers are hastened by artificial The processes of forcing chiefly affect the admission of air, and the proper supplies of heat, light, and water. The grand effect is produced by heat; and the great art to be borne in mind is to supply only just so much of this as will harmonize with the light afforded by the sun, and the quantity of moisture which the nature of the plant under consideration requires. All the operations of nature being gradual, it will never do to accelerate the growth of plants to any very great extent, or in a hurry. The processes of forcing must, therefore, be conducted on a graduated scale; and the heat, light, and moisture must be increased by degrees, as the plant is approaching its maturity. It must be likewise considered that excites require a far higher temperature for forcing purposes than plants grown in a more moderate clime; and that, therefore, the latter must not be subjected to as great heat as the former. Forcing is generally carried on in what are termed hothouses, which are heated by stoves and built of glass, with paved floors, in order to allow the heat and light afforded by the sun to enter. The Dutch, who are particularly celebrated for this horti-Dutch, who are particularly celebrated for this horti-cultural art, however, carry on their forcing in pits heated by the fermentation of manure. Some of the best examples of forcing, as carried on in hothouses and other similar contrivances, can be seen at the Royal Horticultural Gardens, and at the gardens attached to the palace at Kew. For further informa-tion on the subject, the reader is referred to Loudon's "Encyclopedia of Gardening," which dilates at large moneths act of forcing. upon the art of forcing.

FORCING-PUMP. (See PUMP.)
FORD, ford (Sax. ford or fyrd), a name applied to that part of a river where the water is sufficiently shallow to admit of any person or persons crossing by means of wading, without having recourse to a bridge, ferry, or any other means of transportation. In military operations, fords are of the greatest service to an army. They are generally found, either in the widest part of a river, where the current is not so strong, or in a diagonal line with the salient angles of any bend of in a diagonal line with the sament angles of any owner of the stream. Fords for infantry, to be really useful, should not be more than three feet in depth, and those for cavalry should not exceed four feet. From the rapidity of some currents, fords of greater depth are generally

Fore, fore (Sax. fore, advanced), a nautical term, which includes all the distinguishing characteristics of that part of a ship's frame and belongings lying near

the stem; as fore-mast, fore-sheet, &c. &c.
FORECASTLE, fore-küs-tl, a short deck placed in front

of a ship above the upper deck. It is generally terminated at each end, in ships of war, by a breastwork, nated at each end, in sulps of war, by a breastwork, the foremost part reaching the beak-head, and the after portion reaching to the fore-chains. This part of a ship used to be very much elevated, in former times, for the accommodation of archers and cross-bowmen:

#### Fore-shortening

time, to call on a mortgagee who has possession of his estate, to deliver it back, and account for the rents and profits received, on payment of his whole debt and interest. But, on the other hand, the mortgagee may, where there is a power of sale in the deed, which is usual, either compel the sale of the estate, or call upon the mortgage to redeem it presently, or, in default thereof, to be for ever foreclosed from redeeming the same. For this purpose, the mortgagee files a bill of foreclosure; and if, on the day fixed for payment, the money be not forthcoming, the equity of redemption is declared to be forfeited, and the mortgagee obtains absolute possession of the estate.

gages obtains absolute possession of the estate.
Foreign Attachment. (See Attachment.)
Foreign Bill of Exchange. (See Bill of Ex-

CHANGE. )

FOREIGN ENLISTMENT ACTS .- By 3 Jac. I. c. 4, it was made felony for any person whatever to go out of the realm to serve any foreign prince, without having first taken the oath of allegiance before his departure; and by 29 Geo. II. c. 17, it was declared, that if any subject of Great Britain enlist himself, or if any person procure him to be enlisted in any foreign service, or detained or embarked him for that purpose, without license under the kings sign-manual, shall be guilty of felony, without benefit of the clergy. But these statutes were repealed by 59 Geo. III. c. 69, which enacts that any British subject thay be punished by fine and imprisonment, who shall enlist in any foreign service, or fit out vessels to be employed in the service of any foreign power, except by heense of the grown. the realm to serve any foreign prince, without having any foreign power, except by license of the crown.

FOREIGNER. (See ALIEN.) FORELAND, fore'-länd (Dan. land), a term which is nearly synonymous with promontory, cape, or head-land, applied to any projecting point of land running into the sea,—as the North and South Foreland at the nouth of the Thames. In Fort., the term is applied to the ground lying between the defences of any place or

fortress and the moat.

FORMOOK, forci-lok (Ang. sax.), the hair that grows from the fore part of the head. In nautical language, it is applied to a small flat-pointed wedge of iron, used at the end of a belt, to retain it in its place. The expression, to take time by the forelock, means to be early or first in setting about any undertaking.

FORE-SHORTERING, fore-short'-en-ing (Ang.-Sax.), an expression in Paint, and Persp. intended to convey the method of drawing, in strict accordance with the rules of perspective, the limbs or body of a human being, or the body of an animal, when we are looking directly against either of them, in a position which shows their breadth while it conceals their length, either entirely or par-tially. Or, in other words, fore-shortening occurs when the latter is either approaching or receding from us, and when the former is extended, either towards us or from us, in a direction varying from a line which is at right angles to the surface of the eye to another that is parallel with it; under the former of which conditions it would be seen fore-shortened to the greatest possible degree, while, under the latter, it would be viewed in its entire length. Great attention must be paid to the treatment of light and shadow in fore-shortening the arm, leg, or body of a human being, or the carcass and legs of an animal, that the effect or the carcass and legs of an animal, that the effect produced may convey a correct idea of the intention of the draughtaman, and that, although the object is shortened in drawing, so that the front or fore-part only is presented to the view of the spectator, it may be clearly seen that it possesses length, and, as in the case of an extended arm, that it is projecting from the trunk to an extent compatible with the position in which it is placed. Practice in fore-shortening may be best obtained by making drawings from plaster-casts heat obtained by making drawings from plaster-casts best obtained by maning drawings from plaster-custs of figures and animals placed in different positions; but the principle may be readily seen by placing a wooden cylinder on a vertical bar and turning it round, first in the norizontal plane passing through the eye of the observer, and then above and below that plane, while its outline assumes all forms between that of a while its outline assumes all forms between that of a summer or the control of th whence the term forecastle.

Whence the term forecastle.

Law, is the process by which a nortgagor is deprived, or foreclosed, of his right of redeeming the extreme, the cylinder will present examples of foremortgaged estate. By what is called the equity of shortening, although the term is more strictly confined to the view an object presents when its length is in a Sid 2 F 2

line perpendicular to the surface of the eye of the observer, or varying but little from it.

FOREST, for set, a large expanse of ground covered with trees. The word is derived from the low Lat. foresta, which is itself originated by the Ger. forst, forests, which is itself originated by the cor. fore, againfying the same thing. Forests are interesting in many ways, as they may be said to mark the track of civilization, besides being of the utmost utility to man, both from local as well as atmospherical influences. The Caledonian and Heroynian forests are the first we The Caledonian and Heroynian forests are the first we read of as celebrated in history; the former being the retreat of the Picts and Scots in North Britain, the latter extending from Switzerland to Transylvania. In the time of Cæsar, a journey through this forest was computed to last over sixty days, or more. Forests were greatly venerated by the Romans and other ancient peoples, temples being often erected and sacrifices ordained in their honour. This may be considered one of the greatest reasons for the Druids living in them, as it was thought much more sacred to dwell under trees than en plein champ—in the open field. Forests supply man with many necessaries. Timber Forests supply man with many necessaries. Timber and fuel, medicinal and nourishing plants, all trace their source to the luxuriant forest, which, moreover, affords shelter to the houseless and a field of occupation to the hunter. (For an account of the forests of England, see FOREST LAWS.) Forests abroad are mostly composed of (in Europe) calt, elm, beech, poplar, ash, alder, plane, willow, lime, and birch; not to speak of the numbers of wild apple, pear, and other furti-traces; besides pine, fir, and cypress in profusion. fruit-trees; besides pine, fir, and cypress in profusion, with all species of bushwood and vines. In Norway, the forest-land extends up to Drontheim, which is in latitude 63° north. Switzerland is well wooded, and oaks and firs are found at a level over 4,000 feet above the sea. France has some fine examples, her variety of climate being favourable to the growth of all species of trees, some of which, indeed, belong to a much warmer climate: the forest of Ardennes and the Bois de Boulogue may be mentioned as instances of the expanses she has covered with trees. In Italy, the plains of Ravenna afford a wide scope for the luxuriance of forest life, and the pine grows there very extensively; most of the oak, too, used in our navy for shipbuilding purposes, comes from Italy. Russia, however, bears away the palm for her abundance of forests, and some of the finest timber in the world comes from her ports of the finest timber in the world comes from her ports in the Baltic. The districts of Twer and Novgorod are regularly covered with wood, and the forest of Volkonsky is thought the largest in Europe. Poland, too, resembles Russia in this matter, and she may be considered the second well-wooded country. For the king of forests, the reader must look to the New World, where, in both the north and south of America, the vegetation appears to possess no limits. In North where, in both the north and south of America, the vegetation appears to possess no limits. In North America, the forests are gradually disappearing, through the immigration into the country and the diffusion of settlers; but in South America, the whole of the valley of the Amazon, which embraces one-third of the entire area of that country, is one vast forest. It would be impossible to give an account of the various descriptions of trees which are to be found there; for they are apparently without limit, and the size, of the individual trees is generally stucendous. It is there; for they are apparently without limit, and the size of the individual trees is generally stupendeus. It is recorded that a church at Chili, although it was sixty feet long, was built of one single tree. According to Humboldt, the direct influence of forests on climate is a diminution of temperature, which is effected either by screening the soil from the heat of the sun's rays; by the evaporation of moisture from the leaves; or, thirdly, by the uneven surface which the leaves offer to the cooling process of radiation. The indirect influence of forests is the due preservation of moisture in the different countries, in the supply of rivers, and in other ways.

FOREST LAWS (Ger. forst), in England, are laws for the regulation of the royal forests. A forest is, for the regulation of the royal forests. A forest is, properly, an extensive surface of country naturally covered with trees and undergrowth, as distinguished from a plantation which has been made by art. In justices in eyre, wardens, verderers, regarders, forescurity times a great part of England, as of most other countries of Europe, was covered with forests, which subsequently, as being waste lands, came to be resubsequently, as being waste lands, came to be regarded as the property of the crown, and, as abounding with game of various kinds, were carefully pro-

#### Forest Laws

tected, all persons being prohibited from hunting in them but the king, or persons authorized by him. After the time of the Conquest, the forests came to be guarded with greater strictness, their number was increased, and their bounds enlarged, and trespassers were punished with greater severity. Finally, a sys-tem of laws and courts for their administration was tem of laws and courts for their administration was established, by which not only all offences touching the royal forests were tried, but all persons living upon these properties governed. The Conqueror is said to have possessed 68 forests, 13 chases, and 781 parks. A chase is a smaller kind of forest, not subject to the forest laws, and which may be in the hands of a subject, whereas a forest can only be held by the crown. A park differs from a forest or chase in being of smaller extent and inclosed. The Conqueror, who is said to have loved the red deer as if he had been is said to have loved the red deer as it he had been their father, enacted very severe penalties against trespassers, and the killing of a stag or boar was visited with loss of sight. His successors were guilty of still greater cruelties, and it is said that to kill any of the beasts of chase within a forest was as penal as to kill a man. Vast tracts of country were depopulated in order to create new forests or to extend the limits of old ones, and under the colour of forest law the most cruel and horrid oppressions were exeraw the most crue and normal oppressions were exercised. At length, however, many of these hardships were removed by the carda de foresta, obtained in the 9th year of Henry III., the immunities of which, says Blackstone, were "as warmly contended for, and extorted from the king with as much difficulty, as those of the Magna Charta itself." It declares that "no man from henceforth shall lose either life or member for killing our deer; but if any man be taken and convict for taking of our venison, he shall make a grievous fine if he have anything whereof; and if he have nothing to lose, he shall be imprisoned a year and a day," and after that time, if he cannot find sufficient surelies, he shall abjure the realm. It also contains the following provision:—"Whatsoever archbishop, bishop, earl, or baron, coming to us at our commandment, passeth by our forest, it shall be lawful for him to take and kill one or two of our deer, by view of our forester, if he be present; or else he shall cause one to blow a horn for present; or else he shall cause one to blow a horn for him, that he seem not to steal our deer; and likewise they shall do returning from us as it is aforesaid." As this law is still unrepealed, any bishop or nobleman may shoot one or two of the deer, if he pass through a royal forest in going to correturning from parliament. By this charter, many parts which had recently been afforested were diseffected and stripped of their operations were united in the procession withingers, and reputations were made in the pressive privileges, and regulations were made in the regimen of such as remained. The forest courts were instituted for the government of the king's forests in different parts of the kingdom, and for the punishment of all injuries done to the king's deer or venison, to the of all injuries done to the king's deer or venison, to the vert or greensward, and to the covert in which such deer are lodged. These were (1) the court of attachment, ecodmote, or forty days' court, held once in every forty days before the verderers, to inquire into all offences against vert and venison; (2) the court of sucinsote, held thrice in the year before the verderers as judges, the swains or freeholders within the forest forming the jury, to receive and try presentments in all matters connected with offences against the forest least and to inquire into conversions and grissin an matters connected with onenees against the forest laws, and to inquire into oppressions and grierances committed by officers of the forest; and (3) the court of justice-seat, or supreme court, held every third year before the chief justice in eyre or his deputy, to hear and determine all treepasses within the forest and all plains of fearnings. forest, and all claims of franchises, liberties, and privi-leges, and all pleas and causes whatsoever therein arising. There was also what was termed a court of leges, and an example a so what was termed a court or regard, held every third year, for the lawing or expeditation of mastiffs, which was done by cutting off the claws and ball of the fore feet, to prevent them from running after the deer,—mastiffs being the only dogs that were permitted to be kept within the precincts of a forest. The principal officers of the forest were the

## Forestalling

many persons for alleged encroachments on the ancient boundaries of the forests, though the lands thus claimed had been in their possession for several centuries. This was one of the first grievances taken up by the Long Parliament; and an act passed by that assembly (16 Car. I. c. 16), which declared that the boundaries of every forest shall be those commonly known or reputed as such; and that no place where a justice-seat or other forest court has been held within sixty years, thall be accounted forest. Since the passing of that sot; the old forest laws have practically ceased. In Coke's time, there were sixty-mine royal forests, all of which, with the exception of the New Forest in Hampshire, erected by William the Conqueror, and Hampshire, erected by William the Conqueror, and Hampton Court Forest, by Henry VIII., were so ancient that no record afforded any information as to their commencement. The principal of these were the New Forest, Sherwood, Dean, Windsor, Epping, Dartmoor, Wichwood in Oxfordshire; Salcey, Whittlebury, and Rockingham, in Northamptonshire; Waltham in Lincolnshire; and Richmond in Yorkshire. During the present reign, several of the royal forests have been disafforested by act of parliament.

FORESTALLING, fore-stand'-ing (Ang.-Sax.), in Law is, by 5 & 8 Edw. VI. c. 14, described to be the buying or contracting for any merchandise or victual coming in the way to market; or dissuading persons from bringing their goods or provisions there; or persuading them to enhance the price when there. It is commonly associated with regrating, which is described by the same statute to be the buying of corn or other dead victual in any market, and selling it again in the same market, or within four miles of the place; and engrossing, or the getting into one's possession, or buying up, large quantities of corn or other dead victuals, with intent to sell them again; any of which practices were supposed to make the market dearer to the fair trader. Various subsequent statutes were pussed at different times against these alleged offences, until they were at length all repealed by 12 Geo. III. c. 71, on the preamble that, "Whereas it had been found by experience that the restraints laid by several statutes upon the dealing in corn, meal, flour, cattle, and other sundry sort of victuals, by preventing a free trade in the said commodities, have a tendency to discourage the growth and enhance the price of the same," &c. Unfortunately, however, they still remained offences at common law; and even as late as the year 1800, a corn-merchant of the name of Rusby was indicted for regrating thirty quarters of oats, at an advance of two shillings a quarter. It was not, therefore, till the passing of 7 & 8 Vict. c. 24, that forestalling, regrating, and engrossing ceased to be indictable at common law. This statute, however, does not affect the offence of spreading false rumours to enhance

able at common law. This statuto, however, does not affect the offence of spreading false rumours to enhance or decrease the price of goods, which is still punishable. FORFEITCHE, for fiture (Lat. forefactura, expulsion or outlawry), in Law, is a punishment by loss of lands, estates, offices, or personal effects, annexed to certain crimes, illegal acts, or negligence. Forefuture is two-fold,—of real and of personal estates. As to real estates, by attainder in high treason, a man forfeits to the king all his lands and tenements of inheritance, whether fee simple or fee tail, which he holds otherwise than as trustee or mortgages, and all his rights of entry on lands and tenements, which he had at the time of the offence committed, or at any time afterwards, to be for ever vested in the crown; and also the profits of all lands and tenements which he had in his own right for life or years, so long as such interest shall subsist. This forfeiture relates backwards to the time of the treason committed, yet it does not take effect unless an attainder be had; and therefore, if a traitor dies, or is killed before judgment is pronounced, it works no forfeiture of his lands. In felony, the offender forfeits all his chattel interests absolutely, and the profits of all estates of freehold during life; and after his death, all his lands and tenements in fee simple (but not those in tail) go to the crown for a year and a day, after which they escheat to the lord of the fee. These are all forfeitures of real estates, created by the common law, as consequential upon attainders by judgment of death or outlawry. The forfeiture of goods and chattels zecrues in every one of the higher kinds of offences,—in hightreson or misprision thereon; felonies

## Forgery

of all sorts, whether clergyable or not; self-murder, and a few others. In all these cases the personal estate of the offender of every description, whether in action or passion, or settled by way of trust, which he has otherwise than as an executor, or trustee, or mortagee, at the time of conviction, is forfeited to the crown. Lands are forfeited upon conviction. The forfeiter of lands has relation to the time of the fact committed, but that of goods and chattels has no relation backwards; but only such as a man has at the time of conviction are forfeited. Yet if goods be parted with collasvely, in order to defraud the crown, the law will reach time; but a bond fide sale of goods made by a felon or traitor between the commission of the offence and his conviction, is valid. Forfeiture in civil cases may take place under many circumstances. It may result from a breach of express conditions between two contracting parties, as between landlord and tenant, or from a neglect or refusal on the part of a tenant to implement the conditions of his tenure. Lands may also be forfeited by alienation contrary to law, as by conveyance to an alien, or by tortious alienation, as where the owner of a limited or particular estate conveys a greater estate than that which he himself possesses, as where a tenant for life assumes to convey the fee simple. Offices are forfeited by the neglect or misbehaviour of the holders, and the right to the next presentation to ecclesiastical benefices is forfeited by lapse.

Fonce, for (Ang. Noc.), the name of the apparatus used by a blacksmith for heating bars of iron and nammering them into the desired form: it is not unfrequently applied to the place in which the avocations of a blacksmith are carried on, being used in the sense of the word "smithy." It consists of a hearth in the

Fores, for (Ang. Nor.), the name of the apparatus used by a blacksmith for heating bars of iron and hammering them into the desired form: it is not unfrequently applied to the place in which the avocations of a blacksmith are carried on, being used in the sense of the word "smithy." It consists of a hearth in the form of a platform about three feet above the level of the ground, on which a fire of small coal is kindled for the purpose of heating the iron; a pair of large bellows, or a blowing apparatus, worked by a lever or treadle, being attached to it, by which the blacksmith is enabled to make the fuel on the hearth throw out an intense heat and glow. A trough filled with cold water is placed in front of the hearth, in which the heated iron may be cooled when it has been hammered into the shape required; and in addition to these, and hammers of various sizes, as well as rasps, drills, punches, and other instruments, the blacksmith is erovided with anvils on which he hammers the iron when it has been made red-hot. The centre of the anvil-head is flat, with pieces projecting from it at either end, one being made in the form of a wedge, on which the metal may be readily divided, and the other shaped like a cone, on which the iron may be bent into a curved or circular form. The forges in which auchors are made are provided with larger and more powerful instruments; but the shanks, arms, and flukes of large anchors, intended for men-of-war and merchant-vessels of considerable tomage, are welded together by means of Nasmyth's hammer, a contrivance that is worked by steam-power. (See Nasmyth's Hammer, by mending the process more rapidly. One of these—Campbell's steam-forge-siz worked by steam-power. (See Nasmyth's steam-forge-siz worked by steam-power. (See Nasmyth's steam-forge-siz worked by steam-power. (See Nasmyth's steam-forge-siz worked by samall engine, as its name implies, which is attached to the faceted by a combination of wheels, shafts, and levers, attached to a blowing apparatus, and various hammers an

general principles of construction and the manner in which the motive power is applied.

Forger, for-je-re (Lat. crimen falsi), is defined to be "the fraudulent making or alteration of a writing to the prejudice of another man's right." By 5 Eliz. c. 14, to forge or make, or knowingly to publish or give in evidence, any forged deed, court-roll, or will, with intent to affect the right of real property, either freehold or copyhold, was punishable by a forfeiture to the party aggrieved of double costs and damages;

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by standing in the pillory, and having both his ears out off, and his nostrils slit add escared; by forfeiture to the crown of the profits of his lands, and by perpetual imprisonment. As commerce increased, and when paper credits were established, various statutes were passed inflicting capital punishment on the forging, altering, or uttering as true when forged, bank-bills, notes, or other securities, bills of credit, &c.; so that in Blackstone's time, as he says, there was "hardly a case possible to be conceived wherein forgery that tends to defraud, whether in the name of a real or fictitious person, is not made a capital offence." But by 11 Geo. IV. & 1. Will. IV. c. 68, the statutes concerning this offence were consolidated, and, after long and reiterated discussions, the punishment of death was also abolished in all cases, except for the forgery of wills and bills of exchange. Finally, by 2 & 3 Will. IV. c. 123, and 1 Vict. c. 84, the punishment of death was abolished for all kinds of forgery, and a punishment varying from transportation for of death was abolished for all kinds of forgery, and a punishment varying from transportation for life (now penul servitude) to imprisonment for one year, according to the nature of the offence, substituted. It is by no means necessary to constitute atorgery, that the name of any person be counterfeited, though this is the most common mode in which it is effected; for any material alteration, however slight,—as the ante-dating of a deed, is as much a forgery as the other. Even if the name subscribed be a fictitious one, but appended for the purpose of deceiving a one, but appended for the purpose of deceiving, a forgery has been committed. The offence is complete by the making the forged instrument with a fraudulent intent, though it be not published or uttered. consists in the fraud or deceit.

consists in the iran or decet.

FORENT-MR-NOT. (See MYSSOTIS.)

FORK, fork (Sex. forc), a common instrument, consisting of a handle and a blade, the latter of which is divided into two or more prongs, used generally for the table. The table-fork did not come into active use the table. The table-fork did not come into active use in England until the reign of James I., and then it was introduced from Italy. Ben Jonson, in "The Divellis an Asse" (act 5, scone 4), makes one of his characters, Mere Craft, speak of his "pains at court," to get a patent for his project for "the landable use of forks, brought into custom here as they are in Italy, to the sparing of naphins;" and also that the forks are to be "of gold and silver for the better personages, and of steel for the common sort." We may therefore date their use in England from the latter end of the 17th, century. The agricultural or dung-fork is used for the century. The agricultural, or dung-fork, is used for the purpose of lifting manure and rubbish.

FORLORN HOPE, for lorn' hope (Sax. forloren, left without resource; hopa, hope), in Mil. tactics, this term signifies a desperate case. A detachment of men, serin signines a desperate case. A detachment of men, generally volunteers, from different regiments, are selected to assault a breach, or other position of danger, without which a town could not be taken; and this is termed taking a forlorn hope. The taking of the Cashmere gate, at the siege of Delhi, in the year 1837, may be mentioned as an inclusion of a few countries. 1857, may be mentioned as an instance of a forlorn

hope successfully redeemed.

FORM, form (Lat. forma, Fr. forme), is the manner and mode in which anything is presented to our ideas of conception. In Phys., the shape and external appearance of a body, the figure of the same as defined by angles or lines, or that manner of presenting itself to the eye peculiar to different bodies, is termed form; as, form of a circle; form of a square; the form of the human body; and other instances. Form is likewise to be of a circle; of one of square; the form of the adman lodg; and other instances. Form is likewise to be distinguished from the real apparent nature of things; and if we take it in this light, the idea of form is used in a practical manner in our daily speech and scientific pursuits.—In Law, form is applied to a rule to be observed in legal proceedings. We also use the terms, form of rhetoric, form of government, beautiful form, come of rhetoric, form of government, beautiful form, come of the form, account of the southern hemisphere, and disposed into columns, &c., locked up in a chase ready to receive an impression. Whoever esteems the form of a thing more than the thing itself, through narrowmindedness, is considered to be a formalist.

FORMA PAUPERIS, forf-mil paw'-pe-ris (Lat., in the form or condition of a poor person), in Law, by statute 11 Henry VII. c. 12, every poor person that is such as will swear that he is not worth five pounds, shall have

original writs or subparas gratis, and counsel and attorney assigned to him without fee; and is excused from paying costs when plaintiff, by the statute 23 Henry VIII. c. 16, if unsuccessful; but, according to Blackstone, it was formerly usual to give such paupers, if nonsuited, their election either to be whipped or pay the costs. A pauper, however, in the event of success, may recover costs, though he pays none; but this only by order of the court or judge; for the counsel and clerks, though bound to give their labour gratis to him, are not bound to do so to his antigonist, tuless he, too be a pauper. To prevent trifling or malicious actions, various extractions are not bound to do so to his antigonist, tuless he, too be a pauper. be a pauper. To prevent trifling or malicious act various restrictions are made regarding the costs.

FORMEDON, for-me-don (a corruption of the two Lat, words formam doni, according to the form of the gift), in Law, was an old form of action, which was in the nature of a writ of right, and was the highest action the tenant in tail could have. As a tenant in tail could not have an absolute writ of right, which was confined not have an absolute writ of right, which was confined to such only as claimed in fee simple, this writ of formedon was granted to him by the statute de Donis. This writ was distinguished into three species,—a formedon in the descender, in the remainder, and in the reverter, according to the estate of the party who sued. This, with many of the other old forms, was abolished by 3 & 4 Will. IV. c. 27.

FORMIO ACTD, for-mik (in Chem.), HO.C. HO., spec. grav. at 329, 12227. This acid derives its name from the circumstance that twas first obtained from distilling the Formica graft, or red ant. which

name from the circumstance instact was first obtained from distilling the Formica rafu, or red ant, which, when irritated, ejects an acid liquor. It is a burning liquid of an irritating odour. It is exceedingly corresive, producing a sore if dropped on the skin. Below 32° it crystallizes in brilliant scales. It boils at 221.5°, 32° it crystallizes in brilliant scales. It boils at 221°, yielding au inflammable vapour burning with a pale blue flame. Formic acid is easily obtained by mixing, in a large retort, one part of starch, four of binoxide of manganese, and four of water. Four parts of sulphuric acid are then added, and when the maxture has ceased frothing, it is distilled, and yields a weak impure acid, which is neutralized with carbonate of load, and re-distilled with an equivalent of sulphuric acid. With acid, which is neutralized with carbonate of load, and re-distilled with an equivalent of sulphuric acid. With the metals, formic acid forms a series of soluble salts, called formiates. Although an organic product, formic acid has been formed by synthesis by Berthelot.

FORMICA, for-mi-ki (Lat.), a gen. of insects belonging to the fam. Formicide, and distinguished by having the footstalks of the abdomen composed of a single joint, the mandibles triangular, and denticulated at the edges.

(See ANT.)

FORMULA, or FORMULARY, for mu-la, for mu-la-re (Lat.), is a rule or model, or certain terms prescribed (Lat.), is a rule or model, or certain terms prescribed or decreed by authority, for the form or manner of an act, instrument, proceeding, or the like. The Roman law was full of formulas. In clurch matters a formula is a profession of faith; in medicine it denotes the constitution of medicines, either with respect to their prescription or convisions. scription or consistence.

scription or consistence.

Termula, in Chom., is an expression of the composition of a substance by means of symbols. The formulæ of bodies may be either empirical or rational. An empirical formulæ is one giving the elements contained in a body, without reference to their arrangement. For instance, the empirical formulæ of crystallized sulphate of copper would be CuO\_SH<sub>3</sub>, but the rational formulæ, showing its composition, would be CuO\_SO\_5mq. Formulæ are the most convenient way of expressing the decompositions taking place when certain substances are mixed, a few lines of symbols serving for pages of explanation.

## Forthcoming

erected on the sea-coast, for the defence of certain positions, and are garrisoned by a small body of troops.
Although they do not inclose a space of any great ex-Attnough they do not induce a space of any great of the tent, yet they are strongly constructed, and, being placed in commanding situations, often form an important line of defence. They are generally quadrilateral, tant the or detence. They are generally quantinaters, with hastions or demi-bastions at the angles; but it depends mainly on the position they occupy, whether they are triangular, equate, polygonal, or in the form of a crow-work or star. They consist for the most part of a rampart, surrounded with a ditch and glacis; but in some cases an outwork is constructed for the but in some cases an outwork is constructed for the defence of any side on which it may be more easily assailed. Paris is completely girdled with a chain of carefully-planned forts, mostly pentagonal, in the shape of the enceinte, and situated at distances varying from a mile to 2½ miles from the inner line of hastions that encircles the city. Cherbourg may also be cited as an example in which a town is effectively protected from attack by sea or land by a chain of detached forts and redoubts, which is doubled on the conthagent side of the town. south-west side of the town.

FORTHCOMING, in Scots law, is a form of action by which the subjects of an arrestment are made available to the arrester. In an action of forthcoming, the arrester cites the party in whose hands the goods or debts are arrested, to appear before the judge, who, on hearing parties, orders the debt to be paid, or the effects to 18 delivered up to the arresting creditor.

FORTIFICATION, for-tif-e-kui-shun (Lat. fortis, strong, and facere, to make), in Mil., the art of constructing works of defence and offence for the protection or reduction of any important town or position. Such works are always planned by the military engueer, and carried out under his direction and superintendence. They are commonly divided into two intendence. They are commonly divided into two classes, respectively known as permanent fortifications and field works. Under the former all works are included that are constructed for the defence of a town, harbour, arsenal, dockyard, &c., being carefully laid out and built with a view to durability and the resistance of an attack, whenever it may be made; while under the latter, all works are classed that are intended to serve a temporary purpose; such as siege-works and batteries for an attack on a fortress, or lines of intronohment hastily thrown up for the protection of an army in the field, or to check the advance of an enemy an important strategical position. These works on an important strategical position. These works differ mainly in the manner in which they are built, the ramparts and parapets of permanent works being faced or revetted with blocks of granite; the terreplein of the rampart on which the guns are worked, the cheeks of the embrasures, casemates, bomb-proof buildings for magazines, &c., being formed of the same material; while field-works consist of mounds of earth formed of that which is thrown up out of the ditch in front, having the ramparts and embrasures revetted with sods of turf, fascines, gabious, and sand-bags, the terre-plein for the support of the guns and their carriages being made of pieces of thick timber strongly bolted together. To glunce briefly at the history of the rise and progress of the science from the enriest ages to the present time. The existing system of fortification doubtless found its origin in early ages, in the formation of a mound and trench round any small collection of dwellings, for the purpose of affording the inmates and their possessions some protection from the attack of a maranding foe; a gate being made in one part of the rampart for the ingress egress of those that dwelt within it, with a mov-bridge for the nassage of the ditch. This method able bridge for the passage of the ditch. This method was pursued by the Gauls and Britons in the time of was pursued by the Gauss and Britons in the time of Cassar; and they added strength to the earthen mound by throwing it up against a stockade of stout stakes or piles, which were driven into the earth in close proximity to each other, and interwoven with boughs and branches of trees. The field-works of the Romans were as effective as the permanent fortifications of the savage tribes of Central and Western Europe, remaining in many parts of England to this day, as a testimony to the skill of the Roman soldiers in fortifying

### **Fortification**

disposed round the camp, in the form of a circle, and strengthened by an abbatis, or barrieude, formed of the branches and trunks of trees. At a very early period stone walls of considerable breadth and great period atone walls of considerable breadth and great strength took the place of the simple rampart of earth, for the defensive works thrown up around "fenced cities;" and these were furnished with battlements and machicolations (see MACHICOLATION) for the protec-tion of the archers that manned the walls, and as a means of aunoying the besiegers who might attempt to undermine the rampart. The spaces between the battlements, and the battlements themselves, were subsequently modified into the parapet-wall and em-bracures, as we now have them, on the introduction of cannon. Examples of early fortifications are to be found in the remains of the Cyclopian walls that once found in the remains of the Cyclopian walls that once surrounded the old Greek cities of Tiryns and Mycense. The Phoenicians are said to have been the first who The Phonicians are said to have been the first who regularly fortified their cities with stone walls; bit, however this may be, it is certain that the cities of Rypt, and the great cities of Asyria,—Babylou and Nineveh, were girdled with fortifications of marvellous strength and size, on which several chariots could be driven abreast of each other. Until the year 1500, the characteristics of the defensive works of a town were nearly the same in all countries: first, they consisted of a lotty and massive polygonal wall of great thickness, with a fawse-braye, or bank of earth, thrown up in a sloping form against the exterior, to protect it from the attacks of the battering-ram. Then towers were added, in the form of large square or semicircular buttresses, projecting from the angles, and also from the face of the wall in various parts, which enabled the defenders to enfilade that portion of the wall which lay between any two of them, and so defend it in a more effectual manner from the attacks of assailants who sought to make a breach at its base with their engines of war. These flanking towers were the origin of the modern bastions. Cutworks were then constructed beyond the ditch, opposite to the different entrances to the town, for the better protection of the gates, connected with the main works by drawbridges. While this disposition of the wall, and its various parts, may be traced in all the fortifications of ancient cities, and those of the towns and castles of the middle ages, and those of the towns and castles of the middle ages, so it may be seen more fully developed in the curtains, bastions, crown-works, and bridge-heads of the fortifications of modern times. The old method of construction was efficient enough as long as battering-rams, scaling-ladders, and similar engines, formed the chief means of attack, and javelins and arrows the most formidable projectiles that could be showered on the assailants by those who manned the walls; and although the introduction of the inextinguishable Greek fire, in the 7th century, as a missile that although the introduction of the inextinguishable Greek fire, in the 7th century, as a missile that brought death, terror, and destruction in its train, blazing flercely even under water, and injuring everything wherever it fell, with the exception of stone walls, yet no modifications of the principles of construction were found absolutely necessary until the invention of cannon, which followed closely on that of gunpowder, in the 14th century, directed the thoughts of the soldier-architects of the succeeding cycle to seek means whereby the new weapon might be made as means whereby the new weapon might be made as efficient for the protection of the walls, by a proper disposition of the faces of the works with reference to each other, as it was effective in causing breaches in the ramparts, that rapidly crumbled under the crushing shock of the heavy balls of stone and iron that were hurled point blank against them. The result was the hurled point blank against them. The result was the introduction of bastions of the present form, instead of the old flanking towers, projecting from the corners of the work in salient angles, the rampert forming four sides of an irregular pentagon, the fifth, or gorge, being left open as a communication between the bastion and the interior of the fortress. But the chief fault of the old flanking towers was equally perceptible in the new bastions: they were still too small, and too far apart, to defend each other in an efficient manner; and the mlatforms or terre-pleins of the majority were not platforms or terre-pleins of the majority were not calculated for the reception of artillery of any size. Towards the end of the 16th century, an attempt to remedy this defect was made by Errard de Bar le Duc, even temporary camps, and the great strength of their even temporary camps, and the great strength of their works. But the field-works of the Gaule and Britons a French engineer, who introduced considerable improvements into the received methods of constructing

fortifications. He made the faces of his bastions much longer, and the curtains connecting them much shorter, than they had hitherto been; but the faces of the bastions terminated at the shoulders in orillors, or pieces of the rampart in continuation of the face, which we have the shoulders in the face, and the shoulders in the sho pieces of the rampart in continuation of the face, which were in the form of an are, and entered towards the interior of the bastion; and his flanks, which were bereft of their due proportions by the orillons, were disposed at an angle of 80° to the curtain, which would inevitably bring a fire of muskerry, directed from the flank at right angles to its face, on the defenders occupying the opposite extremity of the curtain. De Ville, an engineer who flourished about 1630, lengthened the

> FORTIFICATION. REGULAR ő SECTION VERTICAL

flanks, and constructed them at right angles to the curtain; but a still further advance to the present sys-tem was made about fifteen years later, by Count Pagan, who constructed the faces of his flanks in lines perwho constructed the races of his hanks in lines per-pendicular to the faces of the collateral bastions pro-duced, which caused them to splay outwards from the curtain in such a direction, that a fire directed per-pendicularly from the faces along their entire length would enfilade the faces of the collateral bastions, and

flanks to his bastions, which were parapets parallel to the faces of the outer flanks, rising above one another in tiers towards the interior of the bastion. It remained for Vanbas to give a systematic method of constructing regular fortifications, which he effected by taking fractional parts of the length of the side of the polygon within which the exheinte was formed, and which was bounded by lines drawn to join the salient angles of the hastions, which indeed, were coincident angles of the bastions (which, indeed, were coincident with the angles of the polygon, as far as their vertices were concerned), to furnish the dimensions of various pages of the work. As this is the foundation on which all other systems are based which have been introduced since Vauban's time, and as a knowledge of it is required from all candidates for commissions in the army, a detailed account of the method of constructing a regular front of fortification, in accordance with that engineer's first system, will be presently given. All modern systems of fortification, though they differ in many noints of detail yet arree in the essential angles of the bastions (which, indeed, were coincident All modern systems of fortineation, though they duter in many points of detail, yet agree in the essential parts. "In order to explain these systems, it will be convenient to consider them first without reference to their form, or the position of the ground-lines in respect to each other, but merely as defences against an army with artillery advancing directly in front. In the accompanying figure we show a vertical section of a regular fortification on the ground-line XY, the a regular fortification on the ground-line XY, the place to be defended being supposed to be between X and A. The mass of earth A:BCDEFGH forms the rampart with its parapet. AB is the interior slope of the rampart; BC is the terre-plain of the rampart, having a breadth of about 40 feet, on which the troops and cannon are placed; DE is called the banquette, or slip, on which the soldiers mount to fire over the parapet. EFG is the parapet of a height over the parapet; EFG is the parapet, of a height (about seven feet) sufficient to protect the men and game on the terre-plein, and sloped in the direction FG towards M, the opposite side of the direction FG towards M, the opposite side of the dick, so that a man approaching there may be seen and fired at; GH is the exterior slope of the parapet; and I is the recetment, or wall of masonry supporting the rampart, and strengthened by buttresses placed at small intervals behind it. This must be of sufficient height to prevent its being easily scaled, but yet must not rise higher than the edge of the exterior work at Q, in order that it may not be seen and breached by distant batteries. The exterior front of the rampart. distant batteries. The exterior front of the rampari, covered by the revetment (HK), is called the escary; IK LM is the ditch, the dimensions of which will be determined by the nature of the ground, but must be such in general that its excavation, or debtai, must produce sufficient earth, or remblai, to form the rampart; the opposite side of the ditch (LM) is the counterscarp, also supported by a revetment of masonry; MN is the consered way, a space of about ten yards in breadth, having a banquette (NOP), and protected by a parapet (PQ), the superior slope of which (QR) is called the glacis. The use of the covered way is to allow troops to be drawn up unseen by the besiegers for the purpose of making sorties; by the besisgers for the purpose of making sorties; it also enables the garrison to keep a closer fire upon the approaches of the enemy, and its parapet forms a strong protection to the revetment of the rampart." —(Brande's Dictionary, from which we also borrow the accompanying woodcut.) Colonel Bruce Hamley, in his admirable work entitled "The Operations of the War explained and illustrated," thus expresses his views relative to fortresses:—"At the period when the system of making war was so far organized as to render armies extremely dependent on their bases, but while they were still unwieldy machines not only easily divided and slow of movement, the establishment of great fortresses on frontiers liable to invasion, and on main roads leading from those frontiers to the capital, was an obvious expedient; for these slow-moving bodies could not venture to penetrate within a line of strong places, exposing to the sallies of powerful garrisons the long communications and cumbrous convoys which they did not possess sufficient mobility to defend by pendicular to the faces of the collectal nations pro-duced, which caused them to splay outwards from the curtain in such a direction, that a fire directed per-pendicularly from the faces along their entire length would enfilled the faces of the collateral bastions, and prevent an attacking party from effecting a lodgement in the ditch. He also constructed double and triple

country. They are expensive to construct and expensive to maintain. A few of them will swallow up for their necessary garrisons armies that might turn the scale in the open field. Hence it was only necessary to show that invading armies could pass them, and, after victories in the field, could make of them an easy and certain prey, to render it apparent that a continuance of such a system of defence must be a costly blunder. Forhaps the rudeness of vehicles and the backness of all but great roads, may have combined with the cumbrous organization of the armies of the last century, to render them little capable of passing such fortresses as lay in or near their path. But when such fortresses as lay in or near their path. But when roads and transport improved, and armies underwent roads and transport improved, and armies underwent a change, these mobilized machines, avoiding by a slight detour the fortified places in their way, leaving corps complete in their separate organization to observe or blockade them, and rendering themselves to some extent, independent of convoys by contributions raised within the enemy's frontier, marched upon those points of the theatre that were of greatest strategical importance, seized them, defeated and ruined the hostile armies, and then at their leisure reduced or demanded from the prostrate power the cession of the stronghold in which it had so vainly confided." Thus it was that the single victory of Marengo gave to Napoleon the fortresses of Genoa, confided." Thus it was that the single victory of Marengo gave to Napoleon the fortresses of Genoa, Coni, Alessandria, Cottona, Arona, Piacenza, Cera, Savona, and the citadel of Milan; thus it was that during the memorable seven weeks war, during which the Prussians broke the power of her Austrian rival, she pushed on regardless of the strong places held by her enemy; these fortified positions being rendered almost powerless to inflict mischief, after the defeat of the Austrian forces in the open field. At Plate LVII., fig. 1, we give a drawing of a fortified place. The names of the works are as follows:—a, glacis or declivity; b, covered way; c, counterscarp; d, single tensille; c, double tensille; c, tensille in the ditch; f, horn-work; g, places of arms; h, the most or ditch; f, horn-work; g, places of arms; h, the most or ditch; ravelins; k, half-moons; l, crown-work; m, bonnet 7, norn-work; 3, places of arms; 3, the hotat of ditch; 2, ravelins; 4, half-moons; 6, crown-work; 3, honnet or priest's cap; 3, counterguard; 5, bastions; 5, bastions with circular fluths; 9, curtain; 7, rampart or wall; 8, bridge. The names of the approaches are: 1. trenches of approach; 2. lines of communication; 3. batteries; 4. forts for defence of the trenches; 5. a sap; 6. a mine. At Plate LVIII. we exhibit the whole plan of a place besieged: A, H are the bastions; C, the ravelin; D, line of communication of the attacks; E, first parallel; F, second parallel; G, third parallel; H, the approaches; I, places of arms; K, square redoubts to prevent sallies; L, traverses in the third parallel; M, batteries (a, cannon, b, mortare); N, glace; O, places of arms in the covered way; P, the ditch; Q, bridge of communication; R, a river; S, rising ground. Figs. 2, 3, 4, Plate LVII., display the various ways of mounting guns in the works of a fortified place. Vauban also improved the construction of the ravelin, and was the first engineer who introduced ricochet firing on attacking a fortress. who introduced ricochet firing on attacking a fortress. He also formed traverses in the covered way, to protect the besieged from this kind of firing, and the places the besieged from this kind of fring, and the piaces of arms at the salient and re-entering angles of the covered way. It will be understood, in the construction of works one in advance of another, that the reliefs of the different ramparts, on their heights one above another, must be sufficient to allow of a fire of musketry being kept up from the crest of the parapet of a lower work, while a cannonade is being directed example the army to their size-works from the rem. against the enemy on their siege-works from the ram-parts of the works above, without injuring the men in the work below. Thus the soles of the embrasures in the faces of the ravelin should be in a horizontal line that is, at least, four feet above the crest of the glacis, and the tenaille should be low enough to allow a muskerry fire from the flanks of the bastion, glacis, and the tensille should be low enough to allow a musketry fire from the flanks of the bastion, and the intervening curtain to pass over the heads of its defenders. The Dutch engineer Coehean was contemporary with Vanban, and constructed the fortifications of most of the principal towns of Holland and Belgium. His system is very similar to those of Vauban; but it is distinguished by the introduction of large orillons, formations. He also constructed works of great strength in the immediate vicinity of important harbours distinguished by the interduction of large orillons, formations. He also constructed works of great strength in the immediate vicinity of important harbours the interior of the bastions, as well as in front of them;

and redoubts in the interior of the ravelins, which pro-tected his curtains. About 1740, Cormontaigne, a Frenchman, introduced a system founded on Vanban's, in which he extended the faces of the ravelin in front of in which he extended the faces of the ravelin in front of the curtain, diminishing the extent of the salient angle formed by them. He also formed retrenchments in his bastions, and made the re-entering places of arms in the covered way large enough to admit of the construction of redoubts, having the main ditch immediately in their rear. These were useful in adding to the means of defending the covered way, and they also protected the openings that appear between the extremities of the tensile and the flanks of the bastions, on either side of it. Various additions and modifications of these systems have been introduced from time tions of these systems have been introduced from time to time, by English, French, and German engineers, since 1750. In the present century, however, the most remarkable is the new system, introduced by the Frussians, of surrounding the place with a polygonial execute without beations, and protecting them by flank fires from works resembling caponnières, projecting at right angles from the main walls at the centra of each side of the polygon, so that the guns of the caponnière flank the caponnières, while those of the caponnière flank the execute. The head of the projecting work is protected we require the faces of the projecting work is protected. tions of these systems have been introduced from time enceinte flank the caponneres, while mose of the caponnière flank the enceinte. The head of the projecting work is protected by a ravelin, the faces of which can also be enflished from the enceinte by guns placed in casemates cut in the proper direction. In the stege of Sebastopol, the Russian general Todleben, one of the most skilful engineers of modern times, employed large earthworks with singular success for employed large earthworks with singular success for the protection of the town. (See EARTHWORKS.) The idea of substituting earthworks for stone fortifications has also been warmly supported by Mr. Fergusson. It is not improbable that the great improvements that have been lately effected by Sir William Armstrong and Mr. Whitworth in the construction of guns of heavy calibre, will lead to an inquiry into the form of structure and kind of materials best calculated to resist the shock of the heavy weight of metal that the breaching guns of the present day can launch against the walls of a fortess. With regard to the general plan of constructess. the present day can launch against the wans of a construc-tress. With regard to the general plan of constructrees. With regard to the general plan of construc-tion, whatever may be the new theoretical principles for works of defence that may be broached by modern engineers, it seems necessary, when we consider the great superiority of the guns that would now be used great superiority of the guns that would now be used in a siege over the Lancaster guns and other heavy ordance that were brought into position before Sebas-topol, as lately as 1854-5, that all existing fortifications based on Yauban's systems should be strengthened by a judicious combination of exterior works, in order to a judicious combination of exterior works, in order to enable their defenders to prolong their resistance to the utmost, if not with complete success. That the English government are fully alive to the necessity of doing this, is manifest from the additional fortifications that are being constructed about Plymouth, Portsmouth, Pembroke, Chattam, Sheerness, Portland. Dover, Cork, and other places, for which an expenditure amounting to nearly ten millions sterling has been sanotioned by parliament.—Ref. Straith's Treatise on Fortification; Macauley's Field Fortification; Adde Mémoirs to the Military Sciences; Brande's Dictionary of Arts and Sciences; art. "Portification," in Encyclopadia Metropolitana.

FORTITUES, for-t-stude (Lat.), is one of the virtues termed cardinal. It may distinguish itself actively by resolution or constancy in adhering to duty in the face of difficulty and danger which cannot be avoided, or

resolution or containty in antering to duty in the lace of difficulty and danger which cannot be avoided, or by courage or intrepidity in maintaining firmness and presence of mind in the midst of perils from which there may be escape. Fortitude displays itself passively in enduring with patience, submission, and resignation whatever misfortunes one may be called upon to suffer.

#### **Portunatus**

tresses on the south coast; considerable additions having been made to the fortifications that surround these, as well as other places of importance, since the completion of the works at Cherbourg. There is no inland fortress in Great Britain; but when the subject of the coast defences was brought before parliament in 1859, the formation of a strong fortress at Cannock Chase, in Paffordshire, was auggested, in connection with large government works for casting artillery and the manufacture of firearms.

Fortunatus, for the manufacture of firearms.
Fortunatus, for the mail that, is the title of one of the best German Volksbücher (people's books) ever written, and which has been translated into perhaps every language of Europe. It originated in the 15th century, though many of the tales included in it are of much older date. The oldest printed edition of the book now extant was published at Fraukfort in 1509. The story is, that Fortunatus and his sons are the possessors of an inexhaustible purse of gold and a wishing. sory is, tast rectificates and his sons are the possessors of an inexhaustible purse of gold and a wishing-cap, which, however, in the end, prove their ruin. Thomas Decker made it the subject of his "Pleasant Comodie of Old Fortunatus" (1600); and Tieck gives the story in his "Phantasus" (3 vols., Berlin, 1816).— Ref. Ersch und Gruber's Encyklopadic, 1 sect., vol. 46.

Mef. Ersch und Gruber's Encyklopadic, 1 sect., vol. 46. Forum, fore'um (Lat. forum, a market), the nape given to an open space in Roman citics, generally surrounded by a covered colonnade, that formed an ambulatory, and buildings of various kinds, such as temples, courts of law, prisons, granaries, &c. In the later period of the empire, when Rome had attained the summit of its glory, there were nineteen forw within its limits, which were divided into two classes, some being especially set, apart for public meetings. within its limits, which were divided into two classes, some being especially set apart for public meetings and the proceedings of the law couris, while others were devoted to business purposes and the requirements of trade. The Forum Romanum, the first that was creeded in Rome, served equally for the purposes of trade and all public meetings, as well as for the administration of justice by the consuls, decemvirs, and other magistrates of Rome. This forum was subsequently distinguished for its magnificence; the short were removed and meant remove of the bother. shops were removed, and many temples of the heathen gods, the senate-house, and the comitium, were erected in its immediate vicinity, and in communication with it. It was also adorned with arches, statues, and pulpits, from which public meetings were addressed, and which were called rostra, from being surrounded, with the brazen beals (rostra,) or ornaments of the prows of the ships of war that had been captured by the Roman triemes. Exhibitions of gladiators were often shown in the forum. The Roman forum corresponded to the agora of the Greeks, and no Roman city or colour was without this important centre for shops were removed, and many temples of the heathen sponded to the agora of the Greeks, and no Roman city or colony was without this important centre for the transaction of business and public affairs. Plans of the forum at Pompeii and the principal forum of Rome are given in "Pompeii," a work published by the Society for the Diffusion of Useful Knowledge.

Fossz, or Foss, fos (Fr. fosse, a ditch; from Lat. fodio, fosses, I dig), a term in Fort. applied to a ditch, generally filled with water, encircling the rampart of a fort, lying between the scarp and the counterscarp.—In Aunt., the term is applied to a large cavity in the bone, with no exit or perforation.

Fosszi, fww-sil (Lat. fossus, dug up), in Geol., the body, or any portion of the body, of an animal or plant buried in the earth by natural causes, or any recognizable impression or trace of such a body or part of a

nizable impression or trace of such a body or part of a body. Such is the definition given by Mr. Jukes, one of the most philosophical geologists of the present day. The old geologists used to include minerals, or any other distinct bodies that were found in rocks, under the term of fossils. According to modern views, foseils are simply organic remains, allowing the word "remains" to apply even to foot-prints and other transient impressions. A fossil is not necessarily a petrifaction. Some fossil shells found in comparatively petriaction. Some lossification of nonparticely old rocks, such as the soft compact clays of the colitic series, are less altered from their living state than many shells included in recent coral reefs. Wood, again, may be found in such rocks still soft and but little altered; while in much more recent formations

## Foundation

of a small mine. It is made by sinking a pit about ten or twelve feet below the surface of the ground, and putting a wooden case at the bottom, containing several pounds of powder, and occasionally some shells. It was formerly fired by means of a saucisson, a long narrow beg of lines filled with powder, which was pro-tected from injury likely to arise from the dampness of the ground by inclusing it in a casing of word. The of the ground, by inclosing it in a casing of wood. saucisson communicated with the fougass at one end, while the other was brought in a shallow trench under the earth to any point from which the train might be conveniently fired. Fougasses are generally made in the glacis of a work, to throw the attacking party into confusion when an attempt is made to take the work by storm. A very destructive kind of fougass is made by filling the hole that has been excavated to receive the powder with rough stones as well as earth. In modern warfure, fougasses are exploded by means of the electric spark and by detonating powder, with which wires communicate that are laid in the path by which the assailants advance to the attack. Fougasses that were contrived to be exploded by wires attached to them were found in the Russian works before Sebastopol at the termination of the siege and the occupa-

tion of the town by the allied forces.

FOUNDATION, foun-dai'-shun (Lat. fundatio), the name applied to the surface of the mass on which any superstructure is reared. Foundations are of two kinds.—natural and artificial: but of whichever class the foundations may be on which a building is to be raised, care must be taken by the architect, or builder, to ascertain that there are no existing causes which would render them liable to lateral displacement, whatever may be the weight of the materials that are piled upon them. Rocks, gravel, loamy soil, and clay, are equally available for natural foundations, provided that there be no causes, arising from the position of the strate or from the presence of water underneath, that may tend to produce natural displacement; but the thickness of the lower part of the walls of the building must be in accordance with the nature of the foundations on which the building is erected,—a greater breadth being required for walls on foundations of loam or clay, than for those which are raised on rock or gravel, as the former soils are more susceptible of compression than the latter, and require the footing of the walls that are built on them to be spread out to a the walls that are built on them to be spread out to a greater extent, that n larger area of bearing-surface may be secured. Artificial foundations, on soft, compressible soils of great depth, such as the alluvial deposits at the mouths of tidal rivers, loose shifting sand, and peaty togs, are formed in various ways. One method is to drive in a number of large piles vertically that are of sufficient laurable to a traver and become One method is to drive in a number of large place vertically, that are of sufficient length to enter and become fixed in a substratum of a harder and less-yielding nature. These piles, in some cases, support the entire weight of a building, as columns support a roof; in others, they render the soil into which they are driven more solid, by pressing the earth that is between them more tightly together, and therefore more capable of bearing the heavy weight of any superstructure raised upon it. After the piles have been driven in, bulks of timber are laid transversely across the heads, like sleepers, and the whole is firmly bedded in a mass of concrete, which affords a hard and level platform for the masonry that is to be placed upon it. Sometimes iron tubes are forced into the soil, which are afterwards iron tubes are forced into the soil, which are afterwards filled with concrete; or, when it is practicable, piles of swood or iron are driven in closely together, so as to inclose a space with a close shecting, and the soil in the interior is removed, and replaced by a mass of concrete and rubble. In forming foundations in sand for the piers of bridges, &c., tubes of brick-work, like the linings of wells, are formed and sunk in the same way (see WRIL-SIMING), and the interior is afterwards filled with concrete. In securing foundations for some of the bridges and railway-bridges in various parts of England and France, among which may be named the Royal Albert Vinduot at Salkash, iron tubes of great size were such through the loose soil until the solid rock at the bottom was reached. In peat bogs, large square little attered; while in much more recent formations is the bottom was reached. In peat hogs, large square it is entirely mineralized, and converted either into entirely mineralized.

#### **Foundations**

Laucashire. In all artificial foundations, when timber piles and concrete are used, the engineer has to look carefully to the nature of the materials at his command, and to consider if any change is likely to take place in the normal condition of the soil in which his foundation is made, by subsequent drainage or other causes. For a constant state of moisture, beech and elm afford the best timber for piles; but when the substructure is likely to be drier at some periods than at others, or, in other words, to be exposed to alternations of dryness and moisture, then pine is better that

other words, to be exposed to alternations of dryness and moisture, then pine is better than either of the kinds of timber that have been already named.

FOUNDATIONS, in Pol. Eco., are institutions established and endowed, usually by private individuals, for the promotion of some useful or benevolent purpose. During the middle ages, it was very common to bequeath property for various religious or scholastic purposes. The two great universities of England,—Oxford and Cambridge, owe their existence mainly to this source, as do also the greater number of the gray. this source, as do also the greater number of the grammar and free schools throughout the country. Numerous hospitals have also been established in this way, and various other institutions for the relief and assist-

ance of the poor.

FOUNDING, found'-ing (Fr. fondre, to cast metals, &c.), the term generally applied to the process of producing any article by causing moltan metal or plaster of Paris to ren in a liquid state into a mould of the requisite form, which is made in various ways, and of substances best suited for the reception of the liquid material that is to be poured into it. The process is applied to the manufacture of articles in iron, bronze, bell-metal, lead, steel, copper, porcelain, plaater, and cement of various kinds. The method of founding or casting cannons in iron and bronze will be found elsewhere (see Cannon), and as the process adopted in casting statues in plaster, and making ornamental pottery and busts in Parian ware, differs so materially from that which is used in forming metal castings, each will be described in the notice of that branch of art to which they respectively belong (see PORCHAIN, Por-TERY, SCULTTURE), and the present article devoted to a brief account of the method adopted in founding iron custings of great size, and bells and statues in bell-metal and bronze. An account of type-founding will also be given under its proper heading (see Type-FOUNDING). After iron ore has been reasted, to drive off the arsenic, sulphur, and water that may exist in it, it is thrown in an enormous furnace (see Blast-Furnace, Iron Manufacture), with a quantity of coke and limestone, the latter of which acts as a flux to the and immestone, the latter of which acts as a liux to the ore, and promotes the melting of the iron. The following proportion is generally observed; namely, a ton and a half of coke and 8 cwt. of limestone, broken in very small pieces, to every ton of ore; but if pig iron be used, or iron that has been extracted from the ore, the addition of limestone is not necessary. When this mixture tion of limestone is not necessary. When this mixture is in the furnace, a strong current of air is directed against the glowing mass, and the metal sinks to the bottom of the furnace, leaving a quantity of scorie, technically called "slag," behind it, when the vent at the bottom has been opened, and the molten fluid allowed to escape. The model of the article to be cast is generally made in wood, and from these models moulds are constructed, being made of a peculiar kind of yellow sand, which has been well mixed and kneaded with a little water. If the article is to be made in a solid piece, there is not much difficulty in making the mould, which is generally fashioned in two pieces if the casting be cylindrical in shape, or in more than two if it be irregular in form; but when it is to be east hollow, a core is formed, to occupy the greater two if it be irregular in form; but when it is to be cast hollow, a core is formed, to occupy the greater part of the interior of the mould, leaving a certain thickness everywhere between the inner surface of the mould and the exterior of the core; the former of which gives the external form to the casting, and the latter the internal form. To make the core, a quantity of wax or clay is pressed into the mould, or parts of the mould if it be made in pieces, of the thickness required for the metal. The mould having been thus lined, is then built together, and the internal cavity tilled with sand, or a composition made for the purpose. The exterior mould is then that off, and the wax or clay, which represented the metal, is removed, leaving filled with sand, or a composition made for the purpose.

The exterior mould is then taken off, and the way or law to be the slaves or absolute property of those who clay, which represented the metal, is removed, leaving the gore around which the mould is subsequently built seems also to have prevailed among the Germania for the control of the slaves or absolute property of those who clay, which represented the mould is subsequently built seems also to have prevailed among the Germania for the carbon of children. Abandoned children were declared by law to be the slaves or absolute property of those who clay, which represented the mould is subsequently built seems also to have prevailed among the Germania for the carbon of children.

# Foundling Hospitals

up, being prevented from touching it by stops that are arranged to preserve the negessary space between the mould and the core. They are then thoroughly dried by being exposed to the action of heat, in a drying-stove. Great care is taken to insure perfect freedom from moisture, which would generate steam, and cause an explosion at the entrance of the metal. As soon as all parts of the mould are dry, they are built together and surrounded by sand, which is carefully banked up around and over the mould, to assist in resisting the weight of the metal when it enters; but if the casting be of considerable size, it is generally buried in a pit weight of the metal when it enters; out it the caseing be of considerable size, it is generally buried in a pit below the level of the furnace, which is filled with sand as soon as the mould has been built up in it, and in such cases the mould and core are strengthened by bars and hoops of iron, which have been introduced during the process of making them. Sometimes the moulds are packed with sand into frames of iron or casting-boxes. When all is ready, the furnace is opened, and the metal is allowed to run into the mould along channels made for the purpose, or if the mould be at some distance for the purpose, or if the mould be at some distance from the furnace, and the easting be of small size, it is carried from the furnace by men in large iron pots or crucibles. Sufficient time is then given to allow the casting to cool, after which the mould is broken off, and the iron, if necessary, is cleaned, and the external roughness removed by filing, &c. The above is an outline of the process used in making castings in iron, and it is pretty nearly the same for castings in all kinds of metal, with some slight difference, that is required either by the form of the article (see SERLL), or the peculiar metal of which it is made. In casting large bells for churches, eatherlas, and clock-towers, and groups of figures, or drais, and clock-towers, and groups of figures, or statues of great size, very large furnaces are required, as the whole of the metal used in the casting must be melted and run into the mould at one time. The pit in which the bell is cast is made near the furnace. The core consists of a mass of brickwork covered with a composition of loam and horse-dung, which is carefully fashioned to the shape of the interior of the bell. Another coating of composition is then added. after sprinkling the core with tan-dust to prevent one cost from adhering to the other, and this is carefully moulded to the form of the exterior of the bell, forming what is called the model. More tan-dust is then applied, and on the model a third coating is laid, called the shell, which eventually gives the form to the exterior of the bell. This shell is then carefully taken off and the model removed, after which the shell is built up round the core, and the pit illied with sand or loam. The bell-metal, formed of tin with sand or loam. The bell-metal, formed of tin and copper (see BELL-METAL), which has been melted in a furnace heated with wood, instead of coal or coke, is then allowed to run into the mould. After casting, the tone of the bell is duly regulated. (See BELL) The method used in casting bronze statues is similar to that adopted for castings in iron and bell-metal; but the composition of which the mould and core are made is different, consisting chiefly of a mixture of plaster of Paris and brick-dust. It is unnecessary to make large bronze castings in one piece as they oan be made in parts, which are afterwards soldered together. The composition of bronze is given under its proper heading. (See BRONZE.)—Ref. Wyat's Treuties on Metal-work. to make large bronze castings in one piece, as they

FOUNDLING HOSPITALS, found'-ling (Ang.-Sax.), are charitable institutions established for the care and upbringing of foundlings, or children that have been abandoned by their parents. The object of such institutions is to prevent the destruction of children, either tutions is to prevent the destruction of children, either by actual violence, or through exposure in the streets or highways; and their establishment dates from the middle ages. In ancient Greece and Rome the exposure of children was a frequent practice, as it is among the Chinese at the present day. Neither Plato nor Aristotle condemns it; they content themselves with laying down general rules for the preservation of the healther and stronger at the exposure of the more weakly. Thebes was the only state of ancient Greece that is known to have forbidden by law the exposure of children. Abandoned children were declared by

#### Fountain

nations before the introduction of Christianity. With the spread of Christianity, different feelings began to prevail on this subject; and the exposing of infants was forbidden by the emperors Valentinian and Gratian. At the same time, the stricter laws that came in force concerning marriage and against concubinage, rendered women more auxious than before to conceal their shame; so that, in fact, the danger to infants of being exposed or put to death was rather increased than diminished; and hence Gibbon has some research being exposed or put to death was rather increased than diminished; and hence Gibbon has some reason to speak of child-exposure as one of the most stubborn remnants of heathendom. So early as the 6th century a species of foundling hospital is said to have existed at Trèves; the then bishop of that place permitting children to be deposited in a marble basin which stood before the cathedral, and giving them in charge to the members of the church. The first well-authenticated instance, however, is that established at Milan in 787, but he archyeselvita Duthous. Subscannity found. by the archpresbyter Datheus. Subsequently, found by the archyresbyter Datheus. Subsequently, foundling hospitals were established at Montpellier in 1070,
at Eimbeck in 1200, at Florence in 1317, at Nürnberg
in 1331, at Paris in 1382, and at Venice in 1380. In
1198, Innocent III., when rebuilding the great hospital
of Santo Spirito at Rome, allotted a portion of it for
the reception of foundilings. This system prevails in
France, Spain, and Italy, and in general in all the
Roman Catholic countries in Europe; whereas in Protestant countries it is not looked upon with favour.
The principal chiection that has been reised presing The principal objection that has been raised against foundling hospitals is, that they tend to encourage founding nospitals is, that they tend to encourage illegitimacy; and the great argument in favour of them is, that they have the effect of preventing child-murder. The question is one of very great difficulty; but the prevailing opinion in this country has always been opposed to these institutions, as being, on the whole, more permisions than beneficial. Founding hospitals, too, are more necessary in those countries where there is no legal provision made for the poor, than where, as in our own, the mothers of illegitimate children, if unable to support them, may have recourse to the parish poor-house. The mortality in foundling hospitals has always been very great, though the evil has in some measure been mitigated in more recent times by means of improved management and the practice of means of improved management and the practice of giving out children to be nursed. The usual mode of depositing children in the hospital is by means of a turning-hox fixed in the wall, in which the child is laid, and, on a bell being ruug, it is taken in by one of the watchers. The proportion of illegitimate children in watchers. The proportion of illegitimate conuren me Paris is about one in every three births; and of the total number of illegitimate children, about 58 out of the foundling hospital. total number of illegitimate children, about 58 out of every 100 become inmates of the foundling hospital, where more than one-half of them die before they are a year old. The Foundling Hospital in London was established in 1739, by Captain Thomas Coram, a benevolent sailor, as "an hospital for exposed and deserted children." So great, however, was the influx of inmates, that the funds of the institution were inadequate to its support; and as the system did not meet with much favour in this country, the character of the hospital was, in 1760, changed from a founding to what it now is, an hospital for poor illegitimate children whose mothers are known. The committee requires to be satisfied of the previous good character canaren whose mothers are known. The committee requires to be satisfied of the previous good churacter and present necessity of the mother of every child proposed for admission. The qualification of a governor is a donation of £50. Among the principal benefactors to the hospital was the great Handel, who used to perform his oratorio of "The Messiah"

in the chapel. in the chapel.

Foundam, found-tim (Lat. fons, Fr. fontaine), a spring or source of water rising above the earth in a jet or jets, forced up by either natural or artificial means. Artificial fountains flow from vases, statues, or other picturesque pieces of sculpture. Among the ancients, fountains were generally esteemed Among the ancients, fountains were generally estaemed sacred, and sacrifices and libations were made in their honour. Horace, in his odes, gives a tribute of praise to one at Rome, distinguished by the appellation of Fons Blandssize. Many of the Greek cities were adorned with these beautiful and necessary objects of art, Corinth especially. In the ruins of Fompiliand Herculaneum, fountains were seen in nearly every situation; and, from the number of leaden pipes also found, it seems that every house was provided with 878

## Fourth

one. In modern Rome this practice of having fountains one. In modern Rome time presence of awaying obstants distributed through the city is kept up in the present day; and those of Trevi and the Pauline, at San Pietro in Montorio, are splendid piles of architecture, adorned with imposing pieces of sculpture. In Paris, the fountains of Versailles and St. Cloud used to be continued to the continued fountains of Versailles and St. Cloud used to be considered the finest in the world; but since the erection in England of the system of fountains at Sydenham Palace, they cannot be compared with the latter. Within the last year or so, much attention has been given to the necessity of public drinking-fountains in the streets and thoroughfares of London, and now many of them are supplied with some really artistic jets at each, through the liberality of some of the chief citizens. They are a necessity to a large city, and citizens. citizens. They are a necessity to a large city, and there is no doubt that ere long London will be as well or better supplied than Rome was in this respect.

or better supplied than Rome was in this respect.

FOURIERIEM, foot-re-er-izm, is the name given to a system of socialism promulgated by Charles Fourier (1772—1837), and which differs materially from the systems of communism strictly so called. It professes to be based upon natural laws, and to be founded on calculations which he maintained to be the counterpart. of Newton's physical system. This system, unlike communism, does not, in theory at least, withdraw any This system, unlike of the motives to exertion which exist at present, nor does it contemplate the abolition of private property. According to the Fourierists, there is scarcely any kind of useful labour which is naturally and necessarily disagreeable, unless it be either regarded as dishonourable, or is immoderate in degree, or destitute of the stimulus of sympathy and emulation. They therefore endeavour to strengthen and foster those motives for exertion that are naturally inherent in man. Society was to be formed into associations, or phalansteries, was to be formed into associations, or punantieries, each comprising 400 families, or 1,800 persons, numbers brought out by very careful calculations. The phalanstery was to include everything in structure and character which could gratify the highest taste and sense of enjoyment. The pursuits and functions of the members were to be infallibly adjusted through a distribution by which each person was to be set pre-cisely to that occupation in life to which his passions and propensities directed him. Life was thus to be a perpetual enjoyment, and labour, instead of being a task, was to be as much a source of enjoyment as the pursuits of the honter or the angler. The property of the association was to be held in 1,128 shares, and the whole products were to be divided into twelve parts; of which five were to go to labour, four to capital, and three to skill or talent. The capital of the community may be owned in unequal shares by different members, who would receive proportional dividends; and the claim of each person to the share of the produce appropriated to talent is estimated by the grade or rank which the individual occupies in the several groups of labourers to which he or she belongs. The remuneration, when received, would not of necessity be expended or enjoyed in common. The system, however, as a whole, is so complex, that Fourier himself never admitted that even the most ardent of himsel never admitted that even the most artent or his disciples understood it; and to the last he would sanction nothing as an announcement of his views that he had not himself written. An attempt was made to carry out Fourier's views practically in the neighbour-hood of the small town of Rambouillet, easily accessible from Paris. About £20,000 is said to have been expended in the attempt, which proved a failure. According to J. S. Mill, Fourierism is "the most skilfully combined, J. S. Mill, Fourierism is "the most skilfully combined, and with the greatest foresight of objections, of all the forms of socialism." It "does no violence to any of the general laws by which human action, even in the present imperfect state of moral and intellectual cultivation, is influenced; and it would be extremely rish to prouounce it incapable of success, or unfitted to realize a great part of the hopes founded on it by its partisans."—Ref. Encyclopædia Britannica, art. Communism; Principles of Potitical Economy, by J. S. Mill. Fourn, foarth (Ang.-Sax.), a distance comprising three diatonic intervals. There are three kinds of fourths; viz., the diminished fourth, composed of a whole tone and two semitones; the perfect fourth, consisting of two whole toges and a semitone; and the correme sharp, or superfluous fourth, consisting of three

extreme sharp, or superfluous fourth, consisting of three

whole tones.

## Fousil Oil

Fousic Oil, fou'-sii, in Chem. (C<sub>10</sub>H<sub>11</sub>OHO), a substance foundein brandies distilled from fermented potatoes, rye, barley, and the mare of grapes. Its chemical name is amylic alcohol, under which heading its properties are described.

FOVILLA, fo-vil-li (Lat. fo-vo), in Bot., the matter contained within the membranes of the pollen-grains. It is a semi-fluid granular protoplasm, in which are

this a semi-fluid granular protoplasm, in which are suspended very minute starch granules, and what appear to be oil globules. It is, without doubt, the essential part of the pollen-grain. (See POLLER.)

Fowl. (Sax. fuget).—In its general sense, this term is nearly synonymous with birds; but in a more restricted sense it means those domestic birds brought up in a farmyard for the table. Fowls originally came from Persia and India, and they are valuable to the breeder in many ways, yielding profit as they do in eggs, in broods, and in feathers. The different kinds of this useful domestic creature are the Cochin-Chins, the Hambro', the Spangled, the Spanish, the Bantam, the Malay, the Poland, the Brahmapootra, and the Dorking. Besides these there are several other scarce specimens; as the Japanese Bantam or Silky Fowl, the Enu or Silky Cochin, the Andalusian, the Rangoon, and the Ancona fowls, all of which are bred more for exhibition than for real utility. The Cochin-China is one of the largest of the different The Cochin-China is one of the largest of the different kinds, and the colours of its plumage are buff, lemon, kinds, and the colours of its plumage are buff, lemon, cinnamon, grouse, partridge, white, and black. They are capital layers, and in a short time a pair will stock a yard. The Hambro' fowl is one of the prettiest varieties, and has gold and silver plumage; they are also prodigious layers, but rarely have patience to bring up a brood. The Spanish fowl and the Dorking are the more commonly seen than the other varieties, and are certainly of more use to the breeder, being good sitters as well as layers. The Bantams are the createst favourities, being ramagliable amall birds and good sitters as well as layers. The Bantams are the greatest favourites, being remarkably small birds, and having delicate plumage. It would be impossible to give a description of all the different varieties here; but the reader is referred to "A Plain and Familiar Treatise on the principal Breeds of Fowls," by Mr. John Baily. The Guinea-fowl, or Pintado, is sometimes classed among the common order of fowls; they are very wild and restless in their nature, and, unlike the ordinary fowls, they give no notice to any one of their laying or and restless in their nature, and, unlike the ordinary fowls, they give no notice to any one of their laying or sitting; they have consequently to be closely watched. The Guinea-fowl is very delicate eating, and is in season about Lent. Their eggs are something like those of turkeys, but not so gross. As the Guinea-fowl rarely watches over her nest and rears a brood, its eggs are generally put under a common hen, which performs in a satisfactory manner the duties of foster-mother.

Fox, foks (Ang.-Sax.).—Until very recently, the foxes were placed, by the most eminent naturalists, together with the wolf and dog; but, according to the classification of the mammalia in the British Museum, which system is now generally adopted by zoologists,

classification of the mammalis in the British Museum, which system is now generally adopted by zoologists, it is separated from these animals, and placed in the genus Vulpes. In many particulars, it is true, the fox greatly resembles the rest of the genus Canis; but the shape of the pupil of the eye (which is elongated), the bullet head, the bushy tail, the long body, supported on short limbs,—all these characteristics fully establish the soundness and correctness of the restricts to the second. the soundness and correctness of the position to which the for is assigned in the collections of the great national repository of science. The common for (Vulpes vulgaris) is the only species found in this country. Of so well-known an animal, any minute description would be superfluous. Its colour is reddish-fawn, intermixed with black and white hairs; its tail, or "brush," is of the same colour, except at the tip, which is white. It measures about two feet and a half in longth, and twelve inches in height. Its coat is much heavier and thicker during the winter months. the soundness and correctness of the position to which much heavier and thicker during the winter months, much heavier and thicker during the winter months, when its fur is of greater value than in warmer weather. Linnaus restricts its geographical range to Europe, Asia, and Africa; Cuvier says it is found from Sweden to Egypt inclusively. In eighteen months, the fox attains maturity; and its life varies from twelve to fourteen years. As this, however, can only be said of those animals which have been captured young, or born in confinement, it is probable that, in a wild state, the fox lives to a much greater age. The fox emits a most unpleasant scent, which proceeds from certain glands

#### Fractions

situated at the root of the tail. This powerful odour is rendered more disagreeable from the remarkable tenacity with which it clings to any object which it has once touched. The common for lives on rabbits, hares, partridges; and when occasion offers it a chance of obtaining entrance into the farmyard, it often commits great have among the poultry. This food failing, it will resort to worms and insects for a means of subsistence; and, when dwelling near the sea-coast, sometimes makes a meal of the molluscs and orustaces it can manage to pick up on the shore. It burrows in the ground like the rabbit; and, indeed, often turns out that animal from its domicile to take up its own abode there. Besides the abeve species, there are several others:—the Persian for (V. flavesthere are several others:—the Persian fox (V. flaves-cens), the Arctic fox (V. lagopus), the American fox (V. calmus), the South-African fox, or Casma (V. Casma), the Senegal fox (V. dorsalis), the Kit fox (V. cenerco-aryentatus), the Kokree (V. bengalensis), the Salora (V. niloticus); and one or two others, which are doubtful members of this family.

FORGIOTH. (See DIGITALIS.)
FOX. GRAFES. (See VITIS.)
FOX. GRAFES. (See VITIS.)
FOX. GRAFES. (See VITIS.), a species of dog used in the sport of fox-hunting. An extraordinary amount of care and attention has been given to dinary amount of care and attention has been given to the proper breeding of this animal; and no pack can be justly considered perfect without each particular animal composing it being especially picked out as adhering to the rules laid down for the guidance of dog-fanciers. In the true foxhound, nearly all the individual good qualities which distinguish other varieties of dogs are combined; and, for fleetness, strength, fine scent, spirit, perseverance, and subordination, they have no equals. The foxhound is not a very large



FOXHOUND.

animal, his height averaging from twenty to twenty-two inches. The colour of the foxhound is generally pled; such as yellow, black, dun, fallow, and brown intermixed. In order to be perfect, an old authority on the classe observes, that the animal should be of the following properties. lowing proportions: his legs straight as arrows; his feet round, and of medium size; his shoulders black; his breast wide; his chest deep; his back broad; his head small; his neck thin; and his tail busby, thick, and well-carried. A celebrated forhound bitch, belonging to Colonel Thornton, named Merkin, has been known to run four miles in seven minutes and half a second,—a pace which nearly equals that of the fastest race-horse.

FOL-BUNTING. (See HUNTING.)
FRACTIONS, frük'-shuns (from Lat. frango, I break), a term applied in Arith. and Alg. to designate a part of any magnitude, integer (whole number), or unit. For example, "two and a fraction" means two units and that part of a unit which can be distinguished as one-half, two-fifths, and so on. In the fraction in arithmetic, or  $\frac{a}{1}$  in algebra, the figure 1 or a is the numerator, and 3 or b is the denominator; and they represent that, if a whole number is divided into three

#### Fracture

or b parts, only one or a parts are taken. In the addition of fractions, the fractions must be brought down to the same denominator, and their numerators (as expressed in the value of their new denominator) must then be added, when we have one whole fraction. Thus, if we want to add \( \frac{1}{2} \) we must find the least common multiple of 3 and 5, which is found to be 15; then, as 3 goes 5 times into 16, and 5 goes 3 times into the same number, we multiply the numerators of the different fractions by these respective quotients, and then add the two quantities together. Thus, \( \frac{1}{2} \) added to \( \frac{2}{3} \) will be 5 added to 6 fifteenths. The true definition of a fraction may be thus summed up:—It is the division of its numerator by its denominator; as seven-eighths are equivalent to the whole number 7 divided by 8,—whence a fraction is obtained. Decimal fractions simplify calculations greatly, as they are constructed on the principle of having one common denominator,—a multiple of ten; and thus fractions can be added, subtracted, and divided without repeating over and over the tedious process of bringing them down to a common denominator. (See ARITHMETIO and DECIMALS.)

and DECIMALS.)
Fractures, frak' ishur (Lat., from frange, I break), in Surg., is the term applied to broken bones. This is one of the commonest accidents to which one is liable, especially in very cold weather, when the bones are very brittle, and in certain conditions of the bones themselves. Fractures are divided into simple, compound, comminuted, and complicated. Simple fractures are divided to the simple fractures are divided to the simple compound. tures are those in which the fracture does not commutures are those in which the tracture does not communicate with the external air. These are by far the most common, and usually affect the shaft of long bones, this part being the most subject to injuries of this description. Compound fractures are those in which one or more bones are broken, and the fracture communicates with the external air by means of a wound in the soft parts. Comminuted fractures are those in which the bones are broken into several porthose in which the bones are broken into several por-tions; while complicated fractures are such as are complicated with some other injury; as a wound of the principal artery of the limb. Fractures are also dis-tinguished as transverse, oblique, or longitudinal, according to their direction. A transverse fracture is usually much more easily treated than an oblique; is usually made more easily treated than an obnde; for the parts, when placed in opposition, may be kept there without much difficulty; whereas, in the latter case, they are liable to be displaced by the movements of the muscles or parts; also, in the latter case, the of the muscles or parts; also, in the latter case, the contiguous soft parts are much more liable to be lacerated by broken edges of the bone than in the former. In treating the oblique fracture, the limb should, if possible, be placed in such a position as will relax the principal muscles connected with the bone; in the transverse fracture, the straight position is often the best. The general symptoms of a fracture are deformity of the limb, caused either by the overlapping of the bones, or effusion of blood, lymph, or serum into the cellular tissue, shortening of the limb, and crenitus, or a grating sound when the ends of the and crepitus, or a grating sound when the ends of the fractured bone are moved upon each other. The treatment of fractures consists in restoring the broken fragments, as nearly as possible, to their former positions, and securing them in that state. Where displacement has taken place, it is first of all necessary to soothe the mas taken place, it is first of all necessary to scotch the muscular irritation by means of gentle friction or warm fomentations, after which, by a gentle application of force, the bone is to be restored, as nearly as possible, to its proper position. When the limb has been retuneed, or set, it is to be placed in splitate, which are thin pieces of wood, or other material of the requisite firmness and length, shaped and hollowed out, so as off tevenly without making undue pressure upon any part. The skin is to be protected by folds of linen, or thin soft pads, a little wider than the splitats, which are also useful to prevent them from slipping. These of pressure, and they ought to be removed and readily supply and the production of the surface of the slip in order to detect and rectify any deviation that may be observable. The mode of healing, in simple fractures, differs little from the manner in which bone is originally formed. Immediately after the fracture has taken place, a quantity of blood is poured out into the surrounding cellular tissue by the vessels of the adjoining structures. Inflamma muscular irritation by means of gentle friction or warm by the vessels of the adjoining structures. Inflamma-

## Frame Bridge

tion sets in, and the periosteum becomes thickened; lymph is poured out, by which the ends of the bone are united, and in which bony matter is formed, until a complete union is effected. The period taken for the accomplishment of this varies according to the bone broken, the age, constitution, &c. of the patient. It is quicker in children than in adults, and in adults it is slowest in old age. Taking all ages, however, the time occupied is from two to eight or ten weeks. The treatment of compound fracture consists in placing the broken bones in opposition, and healing the external wound, so as to convert the compound into a simple fracture. This is best done, where it can be effected, by bringing the edges of the wound together with adhesive plaster, or with sutures if necessary. But the modes of treatment in this, and the other complicated cases of fracture, are so varied, and depend in so great a measure upon the circumstances of each particular case, that our limits do not admit of our entering upon them; which is the less to be regretted, as they can only be properly treated at the hands of a skilful surgeon.

Fractal at the hands of a skillul surgeon.

Fractalla, friga-ir-e-a (from Lat. fragrans, fragrant), in Bot., the Strawberry plant, a gen. of the nat. ord. Rosuceæ. Two species are natives of Britain; namely, F. vesca, the wood strawberry, and F. elatior, the hautboy strawberry. The latter is vory rarely met with in a wild state. From these and several foreign species, a great number of varieties have been developed. The fruit is remarkably-wholesome, and is regarded by most people as the choicest of our native fruits. In cultivating the strawberry, an open situation and a rich loamy soil are required. The planta, until the fruit is formed, demand copious supplies of water. The row-culture is most convenient, and frequent re-

The row-culture is most convenient, and frequent renewal insures vigorous plants and large fruit. FramBoRSIA, or YAWS, frünboe-'s-c-ü (Fr., from framboise, a raspberry), a disease of the skin, indigenous to the Antilles as well as Africa. It consists of imperfectly suppurating tumours, which gradually increase in size until they become as large as, and somewhat resemble, a raspberry. The period during which the disease is in progress varies from a few weeks to several months. When it has reached its height, it usually continues for some time without undergoing much change, and then passes away. It seldom proves dangerous, except from the mischievous interference of ill-directed art. The "master yaw," however, or one of the pustules that attains a much larger size to be treated with gentic escharotics. The framboasia is propagated solely by the contagion of the matter discharged from the cruption when applied to the broken skin of another person who has not previously had the disease; for it only affects the same person once.

Frame Bridge, frain-bridj(Ang.-Sax.), abridge built of beams of timber, and framed together, as it is technically called, in such a manner that any weight which may be placed on the structure exerts a crushing or pulling strain on the timbers in the direction of the grain of the wood, any disposition of the pieces that may cause a strain to be exerted on them transversely to the direction of the fibres of the material, being carefully avoided. In making frame bridges of considerable span, the timbers are often put together to present the form of an arch, in the same manner in which centrings are formed on which arches of brickwork or masonry are constructed (see Centerne); but, in the majority of bridges of this class, the weight is either thrown on a horizontal tie-beam by oblique timbers which support a pathway above, and are framed into the tie-beam abutting fitmly against it, and transmitting the weight in the direction of its length, as in the bridge of Schaffhausen, on the Rhine, in which no outward thrust is exerted against the piers on which the tie-beam which supports the structure is laid; or, on the contrary, in some, a great part of the weight is thrown on the abutments of the bridge by diagonal struts through which a considerable outward thrust is conveyed against them. Frame bridges are common in Switzerland, where a roof is frequently constructed over them, to shelter the main timbers of the bridge from the action of the weather. In erecting bridges of this description, care should be taken to prevent

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their decay, from exposure to the weather, as far as possible, by guarding against the settlement of water in the joints of the timbers, and to promote a free circulation of the air about the ends of the beams that rest on or are imbedded in the masonry of the abutmente.

FRANING, frailming (Ang. Sar.), the name applied to the process of jointing and fitting together any kind of work composed of a number of different parts, whether in wood or metal. In carpentry, however this is generally called "joining," and the carpenter who is employed on such work is termed a "joiner."

who is employed on such work is termed a "joiner."

Franc, frink (Fr.), a French silver coin of the value of nearly tenpence sterling. The equivalent in our coinage is, that twenty-five francs go to make one sovereign. The franc, or frank, which was used in ancient times, was a gold piece nearly equal to a crown in value; and the old silver franc was in value equal to a third of the gold one.

Franchise, fran-tshiz (Fr., a privilege or freedom from any onerous duty), in Law, is defined to be "a royal privilege or branch of the king's prerogative subsisting in the hands of a subject." It thus must necessarily arise from a king's grant, or it may be held by prescription, which supposes a grant. The different by prescription, which supposes a grant. The different ginds of franchise are almost infinite; but among them may be mentioned the privileges of bodies corporate, the right to hold courts leet, fairs, markets, ferries, forests, chases, parks, swarrens, and fisheries. They may be lost or forfeited by the parties who enjoy them; and the remedy for the disturbance or interference with a franchise is an action on the case. The right of voting at an election for a member of parliament is also termed a franchise.

FEANCISCANS (GREY), or MINOR FEIARS, frün-siekäns, in Eccl. Hist., constituted one of the four orders käns, in Eccl. Hist., constituted one of the four orders of mendicant friars, and were termed Franciscans, after their founder, St. Francis; Grey, from their grey clothing; and Minor, or Minorites, in token of their humility. The order was established by St. Francis at Assisi, in Naples, in 1208. It was distinguished by vows of absolute poverty and a renunciation of all the pleasures of the world, the members being strictly prohibited from having any property whatever. The rule of the order, sanctioned by the pope in 1210 and 1223, destined them to beg and preach. The popes granted them many extensive privileges, which excited the envy and opposition of the secular clergy, upon whose rights they often made great encroachments; whose rights they often made great encroschments; and they refused to acknowledge any authority whatever but that of the pope. They spread with great rapidity, and at length comprised many thousand monasteries, all established by alms and contributions. monsteries, all established by alms and contributions. The rule of poverty, so strictly enjoined by their founder, came in time to be somewhat relaxed, and the monasteries were permitted to hold property. Learning, too, which was at first despised, came to be cultivated within their monasteries, and many of their members became distinguished as scholars; as Bonaventura, Duns Scotus, Roger Bacon, and others. Several of them have also rison to the highest offices of the Church: poses Nigholas IV. Alexander V. of the Church; popes Nicholas IV., Alexander V., Sixtus IV. and V., and Clement XIV. being of this order. Many of their early austerities were greatly mitigated; and this and other differences led to nu-merous divisions and subdivisions among them. Among the minor orders of the Franciscans thus formed, are the Casarinians, Celestines, Spirituals, Soccolanti (or sandal-wearers), Observantes, Capuchins, Cordeliers, Alcantarines, &c. In the middle of the last century, there were above 7,000 houses of this order, having in them above 115,000 monks, besides about 900 convents, having 28,000 nuns. The Franciscans are not now very popular in Europe, and have been suppressed in more than one kingdom; but they are still one of the most numerous bodies of the Roman Catholic church, and have missions established in almost every part of the world. They are very numerous in the United States of America. The Franciscans are said to have come over into England in 1224, and to have had their first house at Canterbury and their second in London. They subsequently became very numerous in this country.

FRANCOACEE, fran-ko-ai'-g-e, in Bot., the Francoa fam., a nat. ord. of Discolyledones, sub-class Calyciflore,

consisting of stemless herbs with exstipulate leaves and regular flowers, the symmetry of which is quaternary. There are but two genera,—Frances and Tetilla, and regular howers, the symmetry of which is quater-nary. There are but two genera.—Francha and Tetilla, and five species, all natives of Chili. The Francas are reputed to be cooling and sedative; Tetilla is astringent, and is employed as a remedy for dysentery. Frank, frank, is a name given by the Greeks, Turks, Arabs, and other eastern nations, to a Christian. It probably originated at the time of the Crusades, in

which the French particularly distinguished themselves. This was also the name of a powerful German tribe that about the 3rd century of the Christian era were found inhabiting the lower Rhine, and which afterwards overthrew the Roman empire in the north-east of Gaul; overturew the nomine mighten the norm-east of Gauli, whence, in German, that country is termed Frankreich, i.e. the kingdom of the Franks. About the middle of the 4th century they became divided into two groups, the Salic and the Ripunric Franks, the former inhabiting the Low Countries, the latter extending themselves up the Rhine as far as the Main. Each group had its own laws, which, however, did not differ much from each other, and are known as the Lex Salica and the Lex Ripuariorum. The Franks form at the present day Les Rippariorum. The Franks form at the present day the ground (grundlage) of the people of western Ger-many as far as the Neckar, Main, Murg, and the Lower Alsace, as well as the chief Germanic element of the people of northern France. - Ref. Brockhaus' Convereations Lexikon.

FRANK, or FRANKING LETTERS, was the privilege en-FRAME, OF FLAMEING LETTERS, was the privilege enjoyed by the members of both houses of parliament, and many official persons, of sending or receiving a certain number of letters, free of postage, which was abolished on the introduction of the penny postage system in 1840. Before that time each member of either house of parliament was allowed to send daily ten letters, not exceeding an ounce in weight each, to our place in the United Windows and to receive affects any place in the United Kingdom, and to receive tifteen

any place in the United Anguom, and o receive inten-free of charge; a privilege which was greatly abused. Frankalmoigne, freach!-moin (Ang.-Nor.), (Lat. libera eleemosyna, free alms), in Law, is that kind of tenure whereby a religious corporation, aggregate or sole, holdeth lands of the donor to them and their suc-cessors for ever. This is the tenure by which almost all the ancient monasteries and religious houses held their lands. The service which they were bound to render for them was not certainly defined; but only in general to pray for the soul of the donor and his heirs, dead or alive; and therefore they did not fealty (which is incident to all other services), because this divine service was of a higher and more exalted nature. This form of tenure still continues, though the nature of the service was changed at the time of the Reformation, and made conformable to the purer doctrines of the Church of England. If those who hold their tenements in frankalmoigne fail or refuse to perform the enjoined service, the law gives no remedy by distress or otherwise to the lord of whom the lands are holden; he can only complain to the ordinary or visitor, praying him to correct and punish the omission, and provide that such negligence be no more done. The statute of 12 auch negligence be no more done. The statute of 12 Car. II. c. 24, which abolished the old tenures, specially reserved tenure in frankalmoigne.

reserved tenure in frankalmoigne. FRANKENIAGER, franke-n-e-ui-se-e (after John Frankenius, professor of botany at Upsai), in Bot., the Frankeniu fam., a nat. ord. of Dicotyledones, subclass Thalamifora, consisting of herbs and undershrubs much branched, with opposite exstipulate leaves and sessile flowers; calyx tubular, furrowed, persistent; petals unguiculate, 4 or 5, hypogynous; stamens hypogynous, distinct; ovary superior, 1-celled, with parietal placentas; fruit capsular, 1-celled, inclosed in the calyx and dehiscing in a septicidal manclosed in the calyx and dehiscing in a septicidal manner; seeds aumerous; embryo straight, erect, in the middle of albumen. The plants of the order chiefly occur in the south of Europe and north of Africa, but are found in other parts. They are mucilaginous and slightly aromatic. The leaves of a species of Beatsonia are used at St. Helens as a substitute for tea.

Frankingurss, frink-in'-sens (Ang.-Nor.), a name given to a species of gum-resin derived from the Boswellia serrota, and imported from the Levant. By melting it in water, and straining it through coarse cloths, it is cleaned from a good deal of the oil which is one of its component parts,—the oil which is extracted being termed Burgundy pitch, or white resin. If

frankincense is sprinkled on coals, it emits a peculiar

frankincense is aprinkled on coals, it emits a peculiar aromatic odour; whence its name.

Frankelin, frink'-lin (Ang.-Nor.), was the ancient name for a freeholder of considerable property in England. In Chaucer's time, a franklin was a man of substance, enjoying abundance of good cheer, a chief man at the sessions, had been a sheriff, and frequently hight of the shire. The franklin of that day was evidently a person of importance; but, in Skakespeare's time, he stands much lower, being only a yeoman, a man above a wassal or villain. There appears, however, to be no foundation for Dr. Johnson's definition of a franklin as "a gentleman servant, steward, or bailiff."

Frank-marriagium), in Law, was a species of estate tail now gone out of use, and which is defined to be "Where tenements are given by one man to another, together with a wife, who is the daughter or course of

"Where tenements are given by one man to another, together with a wife, who is the daughter or cousin of the donor, to hold in frank-marriage." This implied that the donees should have the tenements to them and the heirs of their two bodies begotten; that is,

they were tenants in special tail.

FRANK-PLEDGE, frank-pledj (Ang.-Nor.), (Lat. franci plegium), in the early customs of England, denotes a pledge, or surety, for the behaviour of a freeman, called also friburgh. Before the Norman conquest, a called also fribirith. Before the Norman conquest, a law prevailed in this country, of the members of each district or circuit being made responsible for the good conduct of each other. Every free-born man, at the age of fourteen (religious persons, clerks, knights, and their eldest sons excepted), was bound to find surety for his truth towards the king and his subjects, or else to be kept in prison. Hence it became customary for a certain number of neighbours to become bound for one another, to see each man of their pledge forthcoming at all times, or to answer for the offence of any new absention binned. This was called frame-pledge one absenting himself. This was called frank-pledge, and the circuit thereof was called decenna, because it usually consisted of ten households. The sheriffs at every county court did, from time to time, take the onths of young persons as they grew up to fourteen years of age, and to see that they were settled in one decennary or another; whereby this branch of the sheriff's authority was called visus franci plegii, or view of frank-pledge. Whenever any one offended, it was forthwith inquired in what pledge he was, and then those of that pledge either produced the offender within thirty-one days, or satisfied for his offence.

TRABERA, frie-ze'-rū (named after John Fraser, a collector of North-American plants), in Bot., a gen. of herbs belonging to the nat. ord. Gentianaceæ. The root of the species F. carolineasis, or Walteri, has properties similar to gentian-root, but is less powerful. It is known as American columba, and is officinal in the Pharmacoponia of the United States.

FRATERNITY, fratter-ne-te (Lat. frater, a brother), signifies literally a body of men united together in one brotherhood, and in Roman Catholic countries denotes societies originated for purposes of devotion. These are of several sorts, the more remarkable of them being.—1. of the Rosary, founded by St. Dominic, and divided into two branches, called the Common rosary and the Perpetual rosary, the latter being under rosary and the Perpetual rosary, the latter being under very strict engagements, and enjoined to repeat the rosary continually; 2. of the Scapulary, whom, according to the Sabbatine bull of John XXII., the Virgin has promised to deliver out of hell the first Sunday after their death; 3. of St. Francis's girdle, who are clothed with a sack of groy colour, which they tie with a cord, and in processions walk barefooted, carrying in their hands a wooden cross; 4. of St. Augustine's leathern girdle, which comprehends a great number of devotees. Italy, Spain, and Portugal are the countries where the greatest number of these fraternities are to be seen, some of which assume the name of arch-fraternities. Pope Clement VII. instituted the arch-fraternity of Charity, which distributes bread every Sunday among the poor; and the fraterbread every Sunday among the poor; and the frater-nity of Death buries such dead as are abandoned by their relations, and causes masses to be celebrated for

FRAUD, fraud (Lat. fraus), in Law, includes all deceitful practices, in defrauding, or endeavouring to defraud, another of his known right, by means of some artful device, contrary to the plain rule of common

honesty. It is condemned by the common law, and punishable according to the beinousness of the offence. All frauds and deceits for which there is no remedy by the ordinary course of law are properly cognizable in equity, and, indeed, constituted one of the chief branches of cases to which the jurisdiction of chancery was originally confined. There are few cases of fraud that are not cognizable by equity, though in most cases the courts of law have a concurrent jurisdiction. Where a fraud can be clearly established, courts of law exercise a concurrent jurisdiction with courts of law exercise a concurrent jumps of the depth of the concept of the detection. A fraudulent conveyance of lands or goods to deceive creditors is, as to creditors, void in law; and a fraudulent conveyance to deceive purchasers is also to such purchasers void. Where a person is party to a fraud, all that follows by reason of that fraud to a fraud, all that follows by reason of that fraud shall be said to be done by him. A party prejudiced by a fraud may file a bill in equity for a discovery of all its circumstances. Mere inadequacy of price alone is not a ground for a court of equity to annul an agreement; but if there be such inadequacy as to show that the person did not understand the bargain he made, or was so oppressed that he was glad to make it, knowing its inadequacy, it will show a command over him which may amount to a fraud. If a person be fraudulently prevented from doing an act, equity over him which may amount to a trade. It a person be fraudulently prevented from doing an act, equity will consider the act as done; and equity also relieves against bargains made under misconception of rights. In treaties, concealment of a material fact by one of the parties, in order to keep the other in ignorance, whereby to profit, is a gross fraud, and the contract will be set aside in equity. Suppressio veri (suppression of truth), suggestio falsi (suggestion of falsehood), in solemn conveyances, releases, or agreements, will afford a sufficient ground for setting them aside. Constructive fraud is applied to such acts or contracts as, though not originating in any actual evil design or contrivance to perpetuate a positive fraud or injury upon other persons, yet, by their tendency to deceive or mislead other persons, or to violate public or private confidence, or to impair or injure the public interests, are deemed equally reprehensible with positive fraud, and are prohibited by law, as within the same reason and mischief as acts and contracts done malo animo. Gross criminal frauds are punishable by way of indictment or information; such as playing with false dice, causing an ill-terate person to execute a deed to his causing an illiterate person to execute a deed to his prejudice, &c. For these and such-like offences, the party may be punished with fine and imprisonment. Fraude are not indictable at common law unless they be such as affect the public; as vending unwholesome provisions, or using false weights or measures; or by way of conspiracy; or unless they affect the crown or the administration of justice.

the administration of justice.

FRAUNIOFER'S LINES. (See SPECTRUM.)

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I break, in allusion to its brittleness), in Bot, the Ash, a gen. of the nat. ord. Oleaceæ. consisting of about fifty species, mostly natives of Europe and North America. The leaves are deciduous, and are pinnste, with a terminal leaflet. The flowers are very imperfect, the calyx being obsolete, and the corolla either wanting or —4-partite. The fruit is a samara (which see). F. excelsior, the common ash, a native of Britain, is a beautiful and umbrageous tree, rising to the height of 100 to 160 feet. The wood is white, tough, hard, and light, much valued by wheelwrights, coachmakers, and turners. It is peculiarly adapted for agricultural implements, handles for tools, and ladders. Some interesting varieties have been developed by cultivation: the weeping ash, with branches drooping to the the weeping ash, with branches drooping to the ground; the curled leaved ash, with dark-green wrinkled or curled leaves; and the entire-leaved ash, with many or all the leaves simple. F. americana, the American or white ash, is a very fine tree, common in Canada and New Brunswick, with wood similar to that of F. excelsior. The sweet concrete exudation known as manna is procured by making incisions in the stems

of certain species of Frazinus, chiefly F. Ornus and rotundifolia, natives of Calabris, Apulia, and Sicily. Manna is a mild agreeable laxative. It owes its properties to a peculiar resin called mannite. The insect which produces the white wax of China feeds upon the species F. chinansie.

which produces was a species of chisensis.

FRECKLES, frek'-Is (Lat. lentigines), are small yellow or brownish spots which appear on the face, especially of fair persons much exposed to the weather. Various applications have been proposed for their removal; and perhaps the best is a limiment composed of limewater and oil, with the addition of a little ammonia.

FREE BENCH, Free bench (Sax. frig. fresh, benc, bench; Lat. sedes libera, or francus bancus), in Law, is that share in copyhold lands which a widow hath on the death of her husband, and which is regulated, as to its quantity, quality, and duration, according to the custom of the particular manor. It is generally a third for life, as at common law; but it is sometimes a fourth part only, and sometimes but a portion of the rent. Frequently the customary right is during widowhood only, and in some manors, if this widow be found guilty of incontinency, she loses her free bench, unless she comes into court riding backwards upon a black ram, and repeating certain ridiculous words. Free bench differs from dower at the common law, in that the former does not attach, even in right, till the actual decease of the husband; whereas the right to dower attaches immediately on marriage.—Ref. Wharton's Low Lexicon.

FREEBOOTER, free'-boot-er (Ger. freiheuter, Fr. flibustier), is a name given to a class of adventurers who have existed at different times and in different countries, but more particularly in the New Continent, and who were usually remarkable for their daring and intrepidity. (See Buccaneers, Filieusters.)

Fire Church, free takurish, is the name assumed by the largest and most influential religious body in

Scotland who differ from the principles of the established church, and who separated themselves from it at the disruption of 1843. They refuse to be called dissenters, because they contend that their principles are those of the Church of Scotland, and that it is the established church, and not they, that have departed from the principles of the Church, as set forth in the Confession of Faith and the other staudards. They are also known as Non-intrusionists, from the great principle against which they contended being the intrusion, or establishing, of a minister in a church by the patron, contrary to the wish of the people. It is a characteristic feature of Presbyterianism, especially in Scotland, that the people have a considerable voice in the affairs of the Church, and that a certain amount in the affairs of the Church, and that a certain amount of deference is to be paid to the popular mind. They have, also, always been opposed to any interference of the civil powers in ecclesiastical matters. By an act of the Scottish parliament in 1567, "anent the admission of them who shall be presented to benefices," it is ordained "that the examination and admission of ministers shall be only in the power of the kirk;" and while reserving the presentation of laic patronages to the ancient patrons, it provides that if the presentee of a patron should be refused to be admitted, it shall be lawful for the patron "to appeal to the General Assembly of the whole realm, by whom the cause being decided, shall take end as they decern and declare." After the union of the two crowns, an act was passed in 1711, as shall take end as they decern and declare." After the union of the two crowns, an act was passed in 1711, as Bishop Burnet says, "merely to spite the Presbyterians, who, from the beginning, had set it up as a principle that parishes had, from warrants in Scripture, a right to choose their ministers." This act declared, that, from and after the 1st day of May, 1712, it shall and may be lawful for her Majesty, her hairs and successors and every other person or her heirs and successors, and every other person or persons who have any right to patronage or patronages, of any church or churches whatever, in that part of Great Britain called Scotland, to present a qualified minister or ministers to any church or churches whereof they are putrons." Attempts were made by the Assembly, from time to time, to obtain a repeal of this measure, but without success; but it is said to have been so unpopular, that, for some years, the patrons were afraid to use the power invested in them, and for fifty years after the passing of that act the Church frequently enforced the non-intrusion prin-

ciple, pronouncing judgments is her courts which show that she either refused to recognize the act, or else regarded it as not interfering with her prerogative. By degrees, however, the right of patrons became more absolute, and the courts of law decided that the ecclesiastical powers might settle the minister in a parish, but that they could not secure him the stipend. About the middle of the last century, also, a large party sprang up in the Church, known as the Moderates, where adouted the views of the nature segment the records. d the views of the patrons against the people; and after many a fight, in which sometimes the assistance of the military had to be called in to settle a minister in his church, the right of the patrons had become absolute. The question of patronage had slumbered for about half a century, when it was again brought into life in 1833, by Dr. Chalmers, who brought his veto measure before the General Assembly, to the effect that the dissent of a majority of the male heads of families resident within the parish, being members of the congregation, and in communion with the church for a period of at least two years, ought to set aside the patron's nominee. The measure was at first rejected; but it was carried the and after many a fight, in which sometimes the as ought to set aside the patron's nominee. The measure was at first rejected; but it was carried the following year, and became law. Nothing occurred to disturb this law till 1837, when the earl of Kinnoul, having as patron presented Mr. Young to the vacant living of Auchterarder, the congregation were so dissatisfied with him, that a protest against his settlement was signed by 287 out of 330 persons on the communion roll. Against the decision of the church courts, Mr. Young appealed to the Court of Session. The highest legal talent was employed on both sides, and after lengthened pleadings the indees decided by The highest legal talent was employed on both sides, and after lengthened pleadings, the judges decided, by a majority of eight to five, in favour of Young. The discussion turned mainly upon the question whether it was competent for the General Assembly to pass such an enactment as the Veto act. The civil court having decided that the Veto act was illegal, the struggle now took a new form,—resistance to civil encroachment on the spiritual jurisdiction of the Church, as well as the maintenance of popular rights. Resolutions in support of the independence of the Church were passed in the Assembly to 1838 and it was agreed to apueal from the Assembly of 1838, and it was agreed to appeal from the Assembly of 1005, and it was agreed to appear it of decision of the Court of Session to the House of Lords, which was accordingly done. The House of Lords confirmed the decision of the inferior court, holding connimed the decision of the interior court, nothing that the Church, in the matter of the fitness of a presentee, "must strictly limit herself to judge of his personal qualifications; that is, his life, literature, and manners." The decision gave great offence to the nonintrusionists. In another case, that of Lethendy, the presbytery ordained a clergyman to the parish church, in the face of an interdict from the Court of Session, and the members of the presbytery were brought before the bar of the court, and subjected to a severe censure. In the Marnoch case, on the other hand, seven clergy-men, forming a majority of the presbytery, complied with the order of the Court of Session, and were sus-pended from their ministerial office by the commission of the General Assombly. The seven presbyters appealed to the civil court, and their opponents were interdicted from preaching in the churches, churchyards, or school-rooms, of the seven deposed presbyters. In 1849, Lord Aberdeen introduced a bill into parliament, with theyiew of composing these differences parliament, with theview of composing these differences and putting the points in dispute on a proper basis; but it was regarded as unsatisfactory by the General Assembly, and was consequently akandoned. Another attempt to heal the breach by act of parliament was made in 1841 by the duke of Argyle, who brought a bill into parliament which was substantially a repetition of the Assembly's Veto act; but parliament having been suddenly dissolved, the measure fell to the ground, In 1842 the General Assembly drew up a claim of right. or "a claim, declaration, and protest anent the en-croachments of the Court of Session," asserting the croachments of the Court of Scssion." asserting the sole headship of Christ over the Church; citing the various statutes by which the independence of the Church and its ovil rights and privileges had been secured; and claiming, in the name of the Church and on behalf of the nation and people of Scotland, as of right, freely to posses her liberties, and to be protected against the encroachments of the Court of Session. This claim was laid before the Queen, and in reply, Sig James Graham addressed a letter to the General

## Freemasonry

sembly, in which the chain of right was pronounced to sembly, in which the chain of right was pronounced to be unreasonable, and the intimation conveyed that the government could not advise her Majesty to acquiesce in these demands.—The disruption took place on the 18th of May, 1843, "the greatest event," says Lord Cookburn, "that has occurred in Scotland since the rebellion in 1745, if not since the union." The General Assembly met on that day, and, after prayer, the mo-derator, Dr. Welsh, read a lengthened and solemn protest against the repeated encroachments of the civil protest against the repeated enconcennents of the divi-power upon the Church, and concluded with a declara-tion that since they could no longer with a clear con-science remain within the Church, it was lawful for them, and others who might concur with them, to sepa-rate themselves from the establishment, and to adopt such measures as might seem proper for the advance suon measures as might seem proper for the avance-ment of God's glory and the proper administration of the affairs of His Church. Having read the protest, he turned towards the commissioner, and bowing respect-fully, slowly retired, followed by Drs. Chalmers, Gor-don, Macfarlane, and all who adhered to them.—The scene was deeply solemn and affecting. Whatever difference of opinion might exist as to the matters in dispute, no one could help admiring the nobleness of the men who had sacrificed all their worldly interests for what they believed to be right and true. The im-mense crowd of spectators looked on with feelings of the intensest interest, many of them being melted to tears.
"There was no hurry, no rush, no confusion—bench after bench was vacant—man after man the protesters atter bench was vacant—man atter man the protesters withdrew in silence, till one entire side of the Assembly, lately so crowded, was left with scarcely an occupant." It had been confidently represented by their opponents, and it is said that the government was influenced by the representation, that except a few of the leaders, the representation, that except a new of the leaders, who might be prevented by shame or wounded pride from retracing their steps, few, or perhaps none, would actually secede. That any large secession would take place, they never for a moment calculated upon. More than 400 ministers, however, left the church of their fathers, and, in that act, abandoned for ever their homes and their means of support, and now cast themselves without reserve upon the sympathies of the people and the good providence of God. They passed through streets crowded by an onthusiastic throng, who wel-comed them with shouts of admiration and gratitude, and proceeded to Canon Mills, where a large hall, capable of accommodating 3,000 persons, had been previously prepared for them. Dr. Chalmers was chosen moderator of the first General Assembly of the Free Church, which continued its sittings to the end of May. On the 23rd of May, an "Act of Separation and Deed of Demission" was adopted, and signed not and Deed of Demission" was adopted, and signed not only by those olergymen who were members of assembly, but by all the others who participated in their views, the number being 474; and, in almost every case, the great majority of their congregations went along with them. The Disruption ministers met with much sympathy throughout the country, and before the new General Assembly rose, Dr. Chalmers anounced that an aggregate sum of £232,347 had been contributed for the support of the Free Church; and during the first veer of its existence its income during the first year of its existence, its income amounted to £366,720. But while it was thus meeting with so much popular sympathy, the moderate purty and their adherents were doing everything in their power against them. The majority of the nobility and and their adherents were doing everything in their power against them. The majority of the nobility and great landed proprietors went with the established church, and some of them were guilty of very crucl and oppressive acts towards the non-intrusionists. Some of them, for a long time, refused to grant any sites on their lands for churches or other buildings, though nearly all have now conceded this favour. Yndeed, people at a distance could scarcely conceive how high party feeling ran, and what bitterness existed between the two parties; and scarcely less remarkable is the degree to which it has passed away in so short a time. Indeed, there are not wanting persons on both sides who entertain lopes that a union may yet be effected; for the Free Church has always kept tenaciously to the principle of an established church, and this has been the only thing that has prevented a union between them and other bodies who have seceeded from the established church, and who are opposed to the principle of state endowments. There can be little

hope of a union, however, unless the State very considerably modifies the laws with regard to patronage. The progress of the Free Church since 1843 has been very remarkable. A sum of upwards of £3,000,000 sterling has been contributed to its various schemes down to the present time. It has upwards of 800 ministerial charges, present time. It has upwarted to contaminate in the greatest besides numerous preaching-stations; it supports missionaries in all parts of the world; has established schools in almost every parish; built churches, manses, schoolhouses, &c.; and has colleges or theological hell for the education of its ministers in Edinburgh, Classical Advances. gow, and Aberdeen. A new source of annoyance has recently arisen, and brought them into collision with the civil power. In 1858, the Free Church minister of Cardress was charged with immorality, and was suspended by the General Assembly. From this decision he appealed to the Court of Session, for which proceeding the General Assembly at once deposed him. After much discussion, the case was at length thrown out on technical grounds, though the fact of the Court of Session entertaining the case was a recognition of the principle sgainst which the Church connition of the principle sgainst which the tended; namely, the right of the civil courts to review their ecclesiastical decisions. The General Assembly opposed the civil jurisdiction on the ground that the minister was subjected to a declaration that he would conform to the regulations of the General Assembly, conform to the regulations of the General Assembly, which preclude all appeal to the civil powers. The court, however, held that this could only apply to the ecclesiastical duties, and not to his civil rights, which had been affected by the decision of the General Assembly. The pursuer, Macmillan, again in 1863 commenced his action sgainst the Assembly, in a revised form, and the issue of it was undecisive. The tenets and government of the Free Church are identical, except in the points already indicated, with those of the Church of Sootland. (See Scotland, Church of Diplets of the Church of Sootland; Marsder's History of Christian Churches and Sects.

FREE CITIES, free sittless, is the name given to

FEEE CITIES, free sit'-ecz, is the name given to cortain German cities which form of themselves independent states. They are Hamburg, Bremen, Lubec, and Frankfort-on-the-Maine, and are all members of the Germanic Confederation.

FREEDOM AND NECESSITY. (See FREE WILL.)

FREEDOM AND NECUSSITY. (See PRES, LIBERTY OF.)
FREEDOM OF THE PRESS. (See PRESS, LIBERTY OF.)
FREEHOLD, free'-hold (Ang.-Sax.), (Lat. liberum tenemently, frank tenement), in Law, is an estate in lands or other real property, held either in fee, in tail, or for life, independently of the will of the foudal lord, and is used in opposition to copyhold lands, held during the will of the superior, or for a term of years. By the feudal law, none but a freeholder was regarded as having possession of the land, and no person who had an estate for less than a lifetime, either his own or some other person's, as his wife's, was regarded as a freeholder. Freehold also extends to offices which a man holds either in fee or during life.

TREEMAN, or FREEDMAN, free'-man, freed'-man, is a term used in contradistinction to a slave, and denotes one that is born or made free, and who enjoys certain privileges which are denied to the other. The title is also given to one admitted to the freedom of a corporate

town, or of any other corporate body.

FREEMAN'S ROLL, free'-manz role.—By the Municipal
Corporations Act, 6 & 7 Vict. c. 78, it is enacted that
the town clerk of every borough shall make out a list (to be called the freeman's roll) of all persons admitted burgesses or freemen, who were entitled to a share or benefit of the lands and public stock of the borough before the passing of such act, for the pur-pose of reserving such rights, and as distinguishing them from the burgesses newly created by the act, and entitled to the rights which it newly confers; these last to be entered on another roll, called the burgess roll.

FREEMASONRY, free-mai'-son-re (Fr. maçon; mason), is a term applied to a secret and wide-spread association, who term themselves Free and Accepted Masons. tion, who term themselves free and Accepted Masons. Societies of Freemasons exist in all parts of the civilized world, and their members are of every religion and condition of life. Every candidate, before his initiation, comes under a solemn engagement never to divulge the mysteries of the order, nor to communicate to the uninitiated the secrets with which he may be intrusted.

and the proceedings and plans in which the fraternity may be engaged. After the candidate has undergone the necessary ceremonies, and received the usual in-structions, appropriate words and significant signs are imparted to him, that he may be enabled to distinguish his brethren of the order from the uninitiated, and to convince others that he is entitled to the privileges of a brother, should he be visited by distress or by want in a distant land. After a due interval of probation, if the newly-admitted member be found qualified for a higher degree, he is promoted, till he has received that hasonic knowledge which enables him to hold the highest offices of trust to which the fraternity can raise agness omces of trust to which the traterinty can raise its members. At regular and appointed seasons, convivial meetings of the fraternity are held in lodges, constructed for the purpose; and all distinctions of rank are laid aside, all differences in religious and political matters forgotten, and peace and harmony generally prevail. Every one strives to give happiness to his brother, and men seem to recollect for once that they are arount from the content that they are arount from the content that they are around from the content that they are a content to the content that they are a content to the content that they are a content to the content once that they are sprung from one common origin, and are possessed of the same nature. According to its own peculiar language, Masonry is founded on "the practice of social and moral virtue." Its character is practice of social and moral virtue." Its character is charity in the most extended sense, and "brotherly love, relief, and truth" are inculcated in it. Like every other society of any duration, it has been subject to the influences of human frailties; and while it has been the means of effecting mach good, it has doubtless at times also been productive of much evil. Recently much has been written both for and against Freemasonry, its ritual, benefits, and tendency; while books have even appeared professing to reveal all the secrets of the order; but most Masons maintain that the true secret of Masonry has never yet been divulged, and there are many even Masonic writers, defenders of the society, who yet call its secret signs and rites accidental and unimportant. No one, we believe, even among intelligent Masons themselves, credits the great antiquity which some of their suthors claim for it. According to some, it is as old as the creation, while others only carry it back to the building of the tower of Babel, and some are content with tracing it no farther back than the building of Solomon's temple. It is asserted that the institution has been continued down, in uninterrupted succession, has been continued down, in uninterrupped succession, from that very remote period to the present day, through all the changes of governments, religion, civilization, and knowledge. It is indeed not improbable, that, after building rose to be a separate art, and to demand a certain amount of skill and training, those who were members of the order should seek to impart a mystery to their profession, and adopt certheir knowledge to others. The later Eleusinian, or other mysteries, to which others trace its origin, may have also imparted to it something of their character; but there is nothing in history, or in the character of Masonry, to warrant us in giving it so high an origin. Missorry, to warrant us in giving it so high an origin. Without, therefore, attempting to unravel its early history, we may state, generally, that the desire for magnificent churches and monasteries by the Roman Catholic priests led to great encouragement being given to the artificers of such works. The pontifis of Rome, and the other potentates of Europe, conferred the factoristic forms. on the fratornity of masons the most important privi-leges, and allowed them to be governed by laws, cus-toms, and ceremonies peculiar to themselves. Such encouragement must have been productive of the most benevolent fund for sged Masons, established in 1842; beneficial results to the fraternity. The association was composed of men of all nations; of Italian, Grewl, french, German, and Klemish artists, who were denominated Freensons, and who, ranging from one country to another, creeted those elegant churches and cathedrals which still excite admiration. Their government was remarkably regular, and the members government was remarkably regular, and the members government was remarkably regular, and the members of Roslin, and founder of the chapel of Roslin, and swidows fund, established in 1842. In miniated to the office of grand master. In mointain James Lin m encouragement must have been productive of the most

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history of Musonry from the earliest times, beginning with Adam, and comprising quotations from some rabbinical tales, respecting the building of the tower of Babel and the temple of Solomon, limited, however, to the information contained in the Bible. It then passes over to the Greeks and Romans, mentioning particularly Pythagoras, Euclid, and Vitruvius. Then we are told that St. Albanus, an honourable Roman knight, patronized the art about A.D. 300, settled the fundamental institutions of the Masons, procured them employment, wages, and a charter from the emperor Carausius, according to which they might form a society in Britain under the government of architects. The devastation of the country, and the destruction of the edifices by the northern tribes, and destruction of the edifices by the northern tribes, and the Angles and Savons, is related; and how the pious athelstan had resolved to restore the ancient and venerable society. By virtue of this charter, all the Masons in the kingdom were assembled, and they established a general, or grand lodge, for their future government. Under the patronage and jurisdiction of this ledge, the fraternity very considerably increased. Freemasonry was first introduced into Scotland by those architects who built the abbey of Kilwinning; and the Kilwinning lodge is the most ancient in that country. After the establishment of the York and Kilwinning lodges, the principles of Freemasonry were rapidly diffused throughout beth kingdoms, and other lodges were erected in different parts of the island, lodges were erected in different parts of the island, which remained under the jurisdiction and control of which remained under the jurisdiction and control of the two mother-lodges. In this way, Masonry con-tinued to flourish in this country for several centuries after it had ceased on the continent; for the Church had come to regard them with suspicion, as being possessed of a power and influence which might, in time, be turned against itself. In this country, an act was passed against them in the third year of Henry III., at the instigation of the bishop of Winchester, which, however was naver enforced; and the king himself be use ausugation of the bishop of Winchester, which, bowever, was never enforced; and the king himself afterwards countenanced them with his presence. James I. of Scotland was also a great patron of the craft. Long before this time, however, the order had ceased to be confined to architects or builders; and noblemen, gentlemen, kings, and princes wards careful. ceased to be confined to architects or numbers; and noblemen, gentlemen, kings, and princes, were enrolled among its members as "accepted Masons." Among those who have held the office of grand master, may be mentioned Henry VII., Cardinal Wolsey, Inigo Jones, and Sir Christopher Wren. After a time, the society of Masons decreased, and sank more and more. In 1717, an entire change was effected in the constitution, and while retaining the name and customs of the tion, and while retaining the name and customs of the ancient fraternity, the society ceased to be connected with building: but for brotherly love and mutual aid. with building; but for botherly love and mutual and. The same year, the first regular grand lodge was formed in London, with power to grant charters for the holding of other lodges. The "Book of Constitutions," drawn up by James Anderson, and based upon the "Gothic Constitutions" of 926, for the use of upon the "Ground Constitutions of 220, 107 and use of the lodges, was published in 1723; and averal editions have since been published. Since that time, Masonry has continued to flourish, and at present the grand lodge of England has upwards of 1,000 lodges under its jurisdiction. It is possessed of great wealth, and distributes several thousand pounds annually for philanthropic purposes; contributing, among other things, to the support of a Masonic girls' school, established in 1788; a Masonic boys' school, established in 1798; a benevolent fund for aged Masons, established in 1842; and a widows' fund, established in 1850. In Scotland,

## Free Spirit

without payment of any duty, and afterwards either re-exported on payment of mere transit duty, or ad-mitted for consumption on paying the usual customs dues.

FERE SPIRIT, BRETHERN OF THE. (See BRETHREN OF THE FREE SPIRIT.)

FREESTONE, free'score (Sax. stan, stone), in Build., the name generally given to any soft atone that can be readily sawn and worked with the mallet and chieel. The various kinds of stone that come from the quarries near Bath, and those near Portland and in the Isle of Purbeck, are freestones; and some kinds of lime-stone are also included under this term, as well as soft sandstones and colites, smong which may be named the magnesian limestone used in building the new palace at Westminster and the houses of parliament.

FREETHINKER, free-think'-er (Sax. thincan, to think), is a term applied to one who exercises freedom of thought, and is generally used in a bad sense to denote one who is sceptical on matters of religion.

DRISM, ATREMEN.)

FREE TRADE, free traid (Sp.-Port. trate, trade), in Pol. Boo., denotes the freedom of buying and selling without any interference by way of improving or otherwise influencing trade. It is only lately that our government has come to see the importance of this manifolds and that all attempts to enougage contains principle, and that all attempts to encourage certain branches of trade and discourage others are detrimental and injurious. (See Corn Laws, Customs Duties, Bounty, Balance of Trade, Political

BOTTIS, BOUNTY, BALANCE OF TRADE, POLITICAL ECONOMY.

FREE WILL, FREEDOM AND NECESSITY, LIEFETY AND NECESSITY, free will, free-dom, ne-sed-c-te, liberts, liberts, liberts, liberts, liberts, liberts, liberts, in Phil., are terms employed to denote one of the most difficult questions in the whole field of mental science,—the power of a man over the determination of his own will. "If," says Reid, "in any action he had power to will what he did or not to will it, in that action he is free. But if in every voluntary action the determination of his will be the necessary consequence of something involuntary in the state of his mind, or of something in his ext circumstances, he is not free; he has not what I call the liberty of a moral agent, but is subject to neces-Freedom has commonly been distinguished into freedom from coercion and freedom from necessity. Freedom from coercion implies, on the one hand, the Areadom from coernon impaces, on the one name, the absence of all impediment or restraint, and on the other hand, the absence of all compulsion or violence. Thus, if we are prevented from doing what is in our power when we desire or will to do it, or if we are compelled to do it when we desire and will not to do it. we are not free from coercion. Freedom from neces sity, called also liberty of election, implies freedom from anything invincibly determining a moral agent. This freedom from necessity, however, does not mean that the agent has no motive or no more inclination towards one course of action than another; for he may have motives prompting him more urgently to act in one direction rather than in another, and still have liberty of election, if he has the power of determining in favour of another course of action. The universal language and practice of mankind is founded upon a belief in a kind of free will. To choose, to deliberate, to determine, are expressions in every man's mouth; and the whole of our penal code is founded upon the conviction that men have the power of doing or abstaining from certain acts. But if we examine the matter more closely, and look at the particular acts of one's life, we will find that this freedom of choice does not actually exist to the extent that we might at first sight be inclined to suppose. We find that if we know the "corcumstances and character of an individual, we can calculate pretty correctly how he will act in a given case. A man's habits, his education, his character, all go in some measure to determine his acting in a given case in a particular way. Hence, therefore, every sot of the will, in some degree at least, depends upon something going before, or in the circumstances of the individual; and in so far it is not absolutely free. "What," says Coleridge, "determines the man to a "What," says Coleridge, "determines the man to a good and worthy act, we will say, or a virtuous course of conduct? The intelligent will or the self-determining power? True, in part, it is; and the will is pre-

## Freezing Apparatus

eminently the spiritual constituent in our being. But will any man admit that his own will is the only and sufficient determinant of all he is and all he does? Is nothing to be attributed to the harmony of the system to which it belongs, and to the pre-established fitness of the objects and agents, known and unknown, that surround him, as acting on the will, though doubt-less with it likewise?" The whole question, howsurround him, as acting on the will, though doubt-less with it likewise?" The whole question, how-ever, is involved in difficulties which defy our limited faculties to solve. "How the will can possibly be free," says Hamilton, "must remain to us, under the present limitation of our faculties, wholly incompre-hensible." "The assertion of absolute necessity is virtually the negation of a moral universe, conse-quently, of the Moral Governor of a moral universe, in a word, atheism." "It would have been better," he said, in speaking of the view of the question as taken by the Scottish school of philosophers, "to show articulately that liberty and necessity are both incomtaken by the Scottish school of philosophers, "to show articulately that liberty and necessity are both incomprehensible, as both beyond the limits of legitimate thought; but that, though the free agency of man cannot be speculatively proved, so neither can it be speculatively disproved; while we may claim for it as a fact of real actuality, though of inconceivable possibility, the testimony of consciousness,—that we are morally free, as we are morally accountable for our actions."—Lectures on Metuphysics.

FINEZULO, FRONT, freezi-jun, front (App. Sax.), the

FREEZING, FROST, freez'-ing, frost (Ang.-Sax.), the solidification or congelation of water or atmospheric vapour by cold. Water begins to freeze when the temperature of the atmosphere is 32° Fahr., at which point ice begins to appear, and continues to be formed, point ice begins to appear, and continues to be formed, unless some circumstance, such as the disturbance of the water, interferes. As the cold increases, other liquids, which are able to resist the temperature at which water congeals, begin to freeze, and pass into the solid form. During spring and the early months of summer, much harm is done to vegetation by frost; and during severe frosts almost all vegetables fall into a state of decay, and even a moderate frost is able to destroy tender plants. When there has been much rain, and when the plants are saturated with moisture, the occurrence of a frost is very disastrous; for as the water contained in the leaves begins to freeze, it exwater contained in the leaves begins to freeze, it expands, rupturing the vegetable fibres and destroying the plant. Fruits are destroyed by frost in a similar manner. When the morning dew freezes, it is called nanner. When the morning dew ireczes, it is caused hoar-frost, or white-frost, and appears generally in spring and autumn. As the air begins to be warmed by the rising sun, the evaporation from the leaves of grass, plants, and shuubs, is accelerated, and the cold increased; hence the moisture which was only dew before the dawn, is often converted into hoar-frost shortly after sunrise. The disastrous effects of frost upon vegetation can only be averted in a very limited manner. That which will protect a plant from dew will protect it from frost; hence a covering of network or thin gauze will protect tender plants or the blossom of wall-fruit. The most efficient mode, however, is to shield the plant from the clear sky, and thus prevent the radiation which must otherwise take place

place.
FREEZING APPARATTS, a contrivance by which liquids are frozen artificially. The first apparatus of the kind was one invented by Sir John Leelic, by means of which liquids were frozen in racue. When the pressure of the atmosphere is removed, liquids evaporate much more rapidly than under ordinary circumstances, the heat producing the evaporation existing in the liquids themselves. When, therefore, accounting submires other in placed in a reseal under existing in the liquids themselves. When, therefore, a quantity of sulphuric ether is placed in a vessel under the receiver of an air-pump, and in it is placed a vessel containing a small quantity of water, on exhausting the receiver, the ether eraporates rapidly, and, in so doing, abstracts the latent heat of the water, which is soon converted into ice. Leslie introduced into the receiver a shallow vessel containing highly concentrated receiver a snation vessel containing highly concentrated sulphuric acid, abore which was placed another vessel containing water; when the air was abstracted, the water evaporated rapidly, and its vapour, on account of the strong attraction which sulphuric acid has for it, was immediately absorbed. In two or three minutes congelation began. Sulphuric acid is not the only substance which is capable of producing this result; any substance which has a strong attraction for water

Fahr.

## Freezing Mixtures

will do as well. Dry potash, muriate of lime, or powder of basalt, are sill used for the purpose. A number of machines of this kind, varying in many ways, have since been constructed. One of the most encessful produced large blocks of ice by the evaporation of ether, and another welded slabs of ice as fust as tion of ether, and another weided since of the sa risk is they were formed. A detailed account of the former, which was patented by Mr. Harrison, is to be found in the "Pharmaceutical Journal," xvi. 477. Its principle generally, is the production of cold by evaporating volatile liquids in vacuo, the condensation of their vapours by pressure, and the continued re-evaporation and reactions of the same material. and re-condensation of the same material.

FREEZING MIXTURES (in Chem.). - Many salts, while undergoing solution, produce a very considerable reduction in the temperature. By mixing 4 oz. of nitre and 4 oz. of sal-ammoniac, and throwing them into water, the temperature is reduced from 60° to 10°; and a mixture of equal parts of water, nitrate of ammonia, and carbonate of soda, the two latter in the crystallized condition, is capable of effecting a reduction from 50° to 7°. Equal parts of snow and salt will maintain a steady temperature of -4° for many hours; amanusan a sceany temperature of -6" for many hours; and if a mixture of three parts of crystallized chloride of calcium and two of snow be made, in a vessel cooled down to 32°, a cold of -50° will be the result. The following are a few freezing-points that may be found useful:—

Mercury	-39°
Mercury	-30°
Bromium	4°
Saturated solution of chloride	
of sodium	40
Sea water	28°
Pure water	320

FEREZING-POINT. (See THERMOMETER.)
FREIGHT, frait (Du. vragt, Ger. fracht), in Com., is the money paid for the carriage of goods by sea, or the price paid by a merchant for the use of a ship to transport goods: the word freight is also sometimes used as synonymous with cargo. When an entire vessel is engaged for the transport of goods, there is usually an instrument executed known as a charterusually an instrument executed known as a charter-party, in which the terms of the agreement and amount of freight are set forth. If, however, merely a part of the ship is engaged, or a certain amount of goods to be conveyed, there is usually a bill of lading made out. Where no formal agreement is entered into, the amount of freight is regulated by the custom or usage of trade. The freight is most commonly determined for the whole waver without respect to time, but for the whole voyage, without respect to time; but sometimes it is made to depend upon time. In the former case it is either fixed at a certain sum for the whole cargo, or at so much per ton, barrel, bulk, or other weight or measure; or so much per cent. on the value of the cargo. The time and manner of paying the freight are frequently regulated by express stipu-lations in the charter-party or other written contract. The master is entitled to detain the goods until the freight has been paid; but the master cannot retain the cargo on board till such payment, as the merchant would in that case have no opportunity of examining the condition of the goods. No right of lien for freight exists unless the freight be earned; but if the freighter or a stranger prevent the freight from befreighter or a stranger prevent the freight from be-coming due, the owner or master has a remedy by ac-tion of damages. When goods are deteriorated during a voyage by fault of the master or mariners, the owner is entitled to compensation; but if from natural causes or perils of the sea, the owner must bear the loss and pay the freight. The merchant, however, cannot set off his claim for damage against the amount of the freight, which must first be paid, and the merchant may then substantiate his claim to compensation for the dewage If a vertion of the search by the the damage. If a portion of the cargo be thrown the damage. If a portion of the cargo be thrown overboard for the necessary preservation of the ship, and the rest reach its destination, the owner is bound to answer to the merchant, by way of general average, for the value of that which was lost, as the freight is to be paid to the owner. Legally, no freight is due until the voyage is completed, which, however, may be overraled by express stippistion. If a merchant covenant to freight a whole or a certain portion of a ship, he is bound to pay the sum stipulated for, though

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his goods do not occupy the entire space. Where the freight is to be paid for the voyage, the owner takes upon himself the risk of its being long or short; where upon himself the risk of its being long or short; where by the time, the risk falls upon the merchant. As regards living animals, if the ship be freighted for transporting them at so much a head, freight is only due for such as are delivered alive; but if for Lading them, it is due for all that were put on board. Where there is no express agreement, the law holds that freight is due for the dead as well as the living.—Ref. Abbott's Law of Shipping; McCulloch's Commercial Dictionary. FRENCH BERIES. (See RHAMNUS.)
FRUNCH CHALK. Freight hishauk, a kind of soap-stone

FRENCH CHALE, frentsh tshawk, a kind of soap-stone of a soft and greasy nature, known by that name, and sometimes called Briançon chalk, because it is obtained of france. It forms a white pigment when properly prepared, and is much used by tailors in marking the pattern of garments on cloth, before cutting them out, as the marks made can be easily obliterated, and cause

no injury to the material.

FRENCH Honn, frontsh horn, a wind instrument, consisting of a long tube twisted into several circular folds, gradually increasing in size from the mouth-piece to the bell, or end at which the sound issues. As it is not provided with holes, like the flute, its sounds are varied by the lips of the player, the greater or lesser pressure of his breath, and the insertion of the hand into the bell, or end from which the sound issues; it may also be tuned to a variety of keys, by means of crocks and shanks, or movable pieces added to, or removed from, the top of the tube, as required. The introduction of the horn, in common with that of the trumpet, dates less than a hundred years ago. Since then it has undergone many changes, and within the last fifty years the whole of this class of instruments have been greatly improved by the addition of keys, valves, crooks, &c. gradually increasing in size from the mouth-piece to

by the addition of keys, valves, crooks, &c.
FRENCH LANGUAGE AND LITERATURE.—The origin of the French language is to be traced to three distinct sources,—the Celtic, the Latin, and the German. Of the Celtic, or earliest of these, the language of the country prior to the Roman invasion, comparatively few traces are to be found in that of the present day. When the prior to the Roman invasion, comparatively few traces are to be found in that of the present day. When the country came under the dominion of the Romans, the Latin being the language of the conquerors, came, by degrees, to be that of the people generally. Not, however, the classic form of that language, which is met with in authors, but a corrupt dialect of it, known as the lingua Romana rustica. On the overthrow of the Western Roman empire, this language became corrupted by the admixture of words and expressions from the Rusquadien Visicathic Emphasis and other large rupted by the admixture of words and expressions from the Burgundian, Visigothic, Frankish, and other barbaric tongues. In the 7th century, two forms of speech prevailed in the country—a corrupt dialect of the lingua Francisca or Theotisca, or the Tudesque. The latter prevailed in the north and east parts of the country, and the former was spoken south of the Loire. The council of Tours (813) recommended the use of both the Rustic and Tudesque versions of the homilies. In course of time these two became in some measure blended, the Latin element remaining the more promished the Latin element remaining the more promished. blended, the Latin element remaining the more prominent; and this corrupt language was called the Romance. It was divided into two branches, which took their names from their respective modes of expressing the word yes. The Visigoths and Burgundians south of the Loire said oc (Latin ac, German auch, also) for y while the Franks and Normans to the north said oil; and hence the dialect of the former was called la langue d'oc, and of the latter la langue d'oil; the former of these, which came to receive the name of Provençal, from the kindgom of Provence, which at one time included the whole of the south of France, was characterized rather by a modification of Latin words, than by the admixture of foreign words and idioms. Though much changed, it is still the dialect of the common people in Provence, Languedoc, Catalonia, Valentia, people in Provence, Languedoc, Catalonia, Valentia, Majorca, Minorca, and Sardinia. Less troubled by wars, and of a more gay and sprightly turn of mind, the language of the southerns speedily became pollshed, and its glory was spread over Europe by the labours of the Troubadours. The dialect of northern France had a much greater admixture of the Germanic element than the south, which was still farther augmented by the establishmest of the Normans in that part, in the

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beginning of the 10th century. The Trouvères of the North, at a later period, in their ruder tongue, followed the example of the Troubadours;—but while the latter sang the soft strains of love, the former celebrated deeds of war and chivalry. After the commencement sang the soit strains of love, the former celebrated deeds of war and chivalry. After the commencement of the Crusades, both languages approached towards a fusion. The cruel persecution of the Abigenses checked the development of the Provencal language; and the extending of the political rule of the north southwards, brought with it the language of that people. The real French language began to be developed about the time of the conquest of Constantinople by the French Crusaders, at the beginning of the 13th century, is the earliest work in genuine French,—French which is quite intelligible to the student of the present day. Francis I. greatly encouraged the development of the French, and substituted that language for Latin in public transactions. Rabelais greatly enriched it; Ronsard and Du Bellay, Amyot and Montaigne, and others, developed it still further. The religious reform, political troubles, the influence of the Italian wars and queens, modified it greatly. The introduction of Arabic words is chiefly due to the Crusades; and of Greek and Latin words, and of scientific terms, to the study of these languages and to the outtivation of the transactions of the lating the strains of the study of these languages and to the outtivation of the transactions. Greek and Latin words, and of scientific terms, to the study of these languages and to the cultivation of the natural sciences. The Académie Françoise, established by Richelieu for the regulation of the national language (1635), the influence of the court, the labours of the Port Royalists, especially Pascal (1666), and a galaxy of great writers, purified, augmented, and diffused it more and more. It was first used as a diplomatic language at the conferences of Nimeguen (1678). The French is the most generally known of all languages among civilized actions. and many illustrations foreign. among civilized nations; and many illustrious foreign-ers, as Leibnitz, Humboldt, Gibbon, and Sir William-Jones, have written some of their works in it. It is a very clear tongue, on account of the strictly logical order of its syntax, but very monotonous, and incapable of the composition of words already fixed, as well as of bold poetic turns. The French language, in short, is, like every other, the exponent of the nationality, like every other, the exponent of the nationality, vicissitudes, intelligence, culture, and taste of the people that speak it. The earliest literature of France is that of the Troubadours and Trouvères. The former flourished most during the 11th and 12th centuries. Their productions were chiefly short lyrical effusions on love or matters of trifling import; and they exhibit little play of the imagination, little depth of emotion, and very slight traces of learning. The Trouveres, on the other hand, in their narrative poems known as Chansons de geste, and written in the energetic langue d'oil, treated of great national subjects, and celebrated the heroic deeds of illustrious kings and knights. Some of their corrections are subjects. of their compositions, especially the earlier, have a striking character of grandeur, which may sometimes be not unfavourably compared with that of the ancient epic poems. These chansons de geste, also called ramances, are very numerous, and have been classified into three cycles, bearing respectively the names of Char-lemagne, King Arthur, and Alexander,—the first cele-brating the deeds of the great Frankish emperor, his descendants and vassals; the second comprising traditionary legends regarding the achievements of King Arthur of Britain and the Norman warriors; the third consisting of poems in which events in the history of Greece and Rome are strangely mixed up with chival-ric notions and legends of fairy-land. These were succeeded by satirical and allegorical poems of equally ric notions and legends of fairy-land. These were succeeded by satirical and allegorical poems of equally rast proportions, some of which enjoyed unparallelong popularity; such as the "Roman de Renard," and the "Roman de Renard," and the "Roman de la Rose." The former is the well-known story of "Reynard the Fox," the "Reinecke der buchs" of the Germans; the latter is a poem of 22,000 verses, 4,150 of which were written by Guillaumed the work was completed fifty years later, by Jean de Mean. This is, perhaps, the most celebrated French man from the most of the 13th century; and the work was completed fifty years later, by Jean de Mean. This is, perhaps, the most celebrated French prose. Such was the opening of the splenderd, of the middle ages. It is a kind of didactic louis XIV., and which is generally styled the Age of production of the middle ages. It is a kind of didactic louis XIV., and which is distinguished by a galaxy of sulegorical poem, which professes to teach the art of the middle ages. It is a kind of didactic louis XIV., and which is distinguished by a galaxy of superior intellects, who, under the royal patronage, love, and embraces the most varied subjects. It contains a great deal of learned lore, scholastic subtleties, and embraces the most varied subjects. It contains a great deal of learned lore, scholastic subtleties, and embraces the most varied subjects. It contains a great deal of learned lore, scholastic subtleties, the did iterary epoch which is generally styled the Age of the most varied subjects. It contains a great deal of learned lore, scholastic subtleties, and embraces the most varied subjects. It contains a great deal of learned lore, scholastic subtleties, who, under the horges in the improvement of its language. Fierre Cornellies tragety to a degree of grandeur which has nought to every because, "Le Cid," "Chorce," "Cinna," and "Pledred, and 886

of oriental origin, and were introduced by the Cruanders into Europe. They are usually written in verse, but sometimes in prose and verse alternately; and are generally based upon some well-known proverb, anecdote, or adventure, often containing a great deal of wit or fun, being generally satirical in their character; they are, however, frequently distigured by a coarse licentiousness. Songs were not neglected; and those of the illustrious Abelard, in the 12th century, enjoyed a wide popularity. The progress of prose was slower than that of poetry; but the 13th century presents two specimens, showing that it had already acquired a degree of power and polish. These are the "Chronicle of the Conquest of Constantinople," by Villehardonin (1207), and the interesting and simple Life of St. character; they are, however, frequently distigured by ple," by Villehardouin (1207), and the interesting and simple Life of St. Louis, written by Joinville, who tells us of the heroic deeds and private virtues of the good thing, whom he had accompanied to the Holy Land.
In the latter half of the 18th century we also find some tolerably good specimens of the drams in the Mysteries and Moralities of that period. The whole of the teries and Moralities of that period. The whole of the literature of the 14th century culminates in Froissart's "Chronicles," which present the liveliest pictures of society and manners during that period of war and gallant enterprise. The greatest writer of the 15th century, also a chronicler like Froissart, is Philippe de Comines, who in his "Mémoires" presents a striking delineation of the characters of Louis XI. and his contemporaries. To the same period belong two of Franco's distinguished noets, who, strange to say, pre-France's distinguished poets, who, strange to say, pre-sent a striking contrast to each other in their outward circumstances, the one the princely Duke Charles of Orleans, the other the low-bred and lawless Villon, a strange compound of villainy and inspiration. A new epoch in the history of French literature begins with the reign of Francis I. (1515). The study of Greek and Roman authors now began to prevail in France; and writers, dazzled by the hitherto unknown beautics of the classical writers, despised the works of their forefathers, and attached themselves to the imitation forefathers, and attached themselves to the imitation of the ancients. Thus arose the so-called modern classical school; while that which, instead of imitating the ancients, derived its materials from national elements, has been designated by the appellation of Romantic. Tolerably free from the classic element are the works of Clement Marot, the greatest French poet of the reign of Francis I; while the leader of the new or classical school was Ronsard, an author long extolled far above his merits. A host of other writers characterize this century, chief among whom are Rabelais and Montaigne. In the 17th century Malherbe anneared as the reformer, or rather the regulator, of appeared as the reformer, or rather the regulator, of poetry, a man of fastidious taste but meagre imaginawho despised the artistic luxuriance of Ronsard, tion, who despised the artistic luturiance of Monard, introducing in its stead a style of grammatical correctness and dry elegance, which sometimes reached pomposity. Balzac devoted his attention to the improvement of proce, and his semi-philosophical works, especially his Epistles, were valuable at the time as models of careful and harmonious style. Such were also the frivolous but witty letters of his friend Voiture. In 1634 the French Academy was instituted, under the auspices of Cardinal Richelieu, "to establish certain rules for the French language, and to make it not only elegant but capable of treating all matters of art and acience." Three writers of this period enriched French literature with important works, and did much towards the improvement of its language. Pierre Corneille

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remind one of the productions of ancient Greece; while comedy reached its highest pitch with Molière, whose masterpieces, "Le Misanthrope," "L'Avare," and "Les Fernmes Savantes." are very humorous creations. In his Fables, La Fontaine showed himself the greatest master of that kind of composition in modern times. Didactic poetry was represented by Boileau, whose works are remarkable for symmetry and good same but are articly deficient. represented by Bolleau, whose worse are remarable for symmetry and good sense, but are entirely deficient in poetical enthusiasm. Moral philosophy was cultivated by Malebranche, the disciple of Descartes, and author of "La Recherche de la Vérité;" by Bossnet, who wrote "Conneissance de Dieu et de soirmème;" by Fonclou, as in his treatise "De l'Existence de Dieu; and by Pascal, in the fragments which have been col-lected under the title of "Penaces;" while La Roche-foucauld, in his "Sentences et Maximes," wrote a libel upon maukind, and La Bruyère, in his "Caractères," drew vivid and amusing sketches of human characters and manuers. In the field of history, we also meet with Bossuet, as the author of "Discours sur l'His-toire universelle," and "Histoire des Variations des with Bossuet, as the author of "Discours our Littles toire universelle," and "Histoire des Variations des Eglises Protestantes." Here, too, we have Mézeray, author of the "Histoire de France," and Fleury, author of "Histoire de l'Eglise." In memoirs and letters, there are the personal "Mémoires" of Cardinal De Retz ; Hamilton's "Mémoires du Comte de Grammoot; and the interesting letters of Madame de Sé-vigné to her daughter and friends. The 17th century had been, on the whole, a religious one; but the 18th was eminently an ago of scepticism and infidelity. Literature now became a means of conveying bold opinions, or assaulting time-honoured creeds and institu-The persons who exercised the chief sway during this period, and who exerted a powerful influence upon their contemporaries, were Montesquieu, Voltaire, J. J. Rousseau, and Buffon. Montesquieu, a writer of great force and brilliancy, and of unusual scope of great force and brilliancy, and of unusual scope of mind, commenced his literary career by publishing "Les Lettres Persanes," attacking French manners, institutions, and even religion. His principal works, however, are his "Considerations sur la Grandeur et la Décadence des Romains," and his "Esprit des Lois," an able and profound disquisition upon general legislation. Voltaire, the true personation of his age in disposition, as well as in talents, was, for half a century, the leader of public opinion in France. His wonderful versatility enabled him to treat successfully almost all branches of literature,—tragody, satire, romance, poetry, history, and philosophy. The passionate eloquence of Rousseau made him be listened to and believed in, even when he was declaring war ate eloquence of Rousseau made him be listened to and believed in, even when he was declaring war against civilization, and attacking the social order of things. Buffou occupied a less-sigitated sphere, devot-ing himself to the study and description of nature; and, by his "Histoire Naturelle," he introduced a new era in the study of natural history. Diderot and D'Alembert founded the "Encyclopidie," a vast re-view of human knowledge, but always bestie to assis. D'Alembert founded the "Encyclopédie," a vast review of human knowledge, but always hostile to religion. Helvetius, in his treatise "De l'Esprit;" D'Holbach, in his "Système de la Nature;" and Lametterie, by his "L'Homme Machine" and "La Vie heureuse de Sôncauc," far exceeded the encyclopedists in the destructive tendency of their destructive tendency of their destructive. destructive tendency of their doctrines. Among the few defenders of revealed religion during the period was J. Vernet. Among the metaphysical writers, the first place is due to Condillac, followed by Van the first piace is due to commen, amount of Geneva, all of whom remained on the side of moderation, and save little support to the tendencies of the age. One of whom remained on the side of moderation, and gave little support to the tendencies of the age. One of the most learned historians of that period was Mably. Charles de Brosses, Goguet, Barthélemy, Raynal, De Mehegan, Velley, are also names of note in this department. The mathematical and physical in this department. The mathematical and physical sciences made great progress in France during the sciences made great progress in France during the 18th century; as witness the names of D'Alembert, Lagrange, Lalande, Lacaille, Maupertuis, Clairaut, Lemonnier, Condamine, and others. In natural history, we have Butfon and Charles Bonnet, Brisson, Viog d'Azyr, Jussieu in botany, and Saussure in geology. In poetry, the drama, and general literature, we may mention the names of Crebillon and Ducis, both tragic poets; Le Sage, author of "Fill Blas" and of "Turacaret," perhaps the best comedy after those of Molère; Beaumarchais, author of the "Barbier de Se-

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ville;" Bernardin de St. Pierre, author of "Paul et Virginie;" St. Simon, whose "Mémoires," have gained: a deserved celebrity; Marmontel, the author of "Bélisaire," and Lebrun, the lyric peet. The period of the Revolution was by no means favourable to literature, and little more so was that of the Empire which succeeded. Madame de Stael and Châteaubriand were the forerunners of a revival, which was, perhaps, less owing to their works than to the influence upon public tasts of the master-pieces of English and German literature, which found more and more admirers in France. A new romantic school new sprung up; and, through the exertions of many young and original writers, new life was infused into nearly every branch of literature, poetry, history, philosophy, and the drama. An animated controversy was maintained between the supporters of reform and the adherents of the classical sc hool; and the contest reached its utmost the classical school; and the contest reached its utmost fury when Frédéric Soulié, Alexandre Dumas, Victor Hugo, Alfred de Vigny, and others, produced on the stage dramas framed according to their ideas of the Shakespearean style. It was only after several years that the younger body of combatants came out victo-rious. Novels which, during the excitement of this-counter had been analyzatived beaumath. rious. Novels which, during the excitement of thiscontest, had been scarcely noticed, became the rage soon after it was settled. George Saud (Madame Dudevant), one of the most elegant writers of her country, established her character by her "Indiana," which appeared in 1832; and has since published many popular works. Alexander Dumae, the inexhaustible story-teller, has won immense popularity by his works, "Trois Mousquetaires," "Le Comte de Monte Christo," and numerous other works. Eugène Suc (Christo," and numerous other works. Eugène Suc also obtained great popularity from his works "Les also obtained great popularity from his works "Les also obtained great popularity from his works as "Heich depict in glaring colours the miseries and depravities of society. Among other distinguished writers, we may mention Honoré de Balzac, Frédérie Soulié, Almay mention Honoré de Balzac, Frédérie Soulié, Alphonse Karr, Alfred de Musset, Prosper Mérimée, Madame Emile de Girardin, Théophile Gautier, Jules Sandeau, and Emile Souvestre. A new generation of storytellers has been rising within the last few years, who, though their powers are scarcely to be compared who, though their powers are scarcely to be compared with those of their predecessors, are nevertheless not devoid of talent. Some of them belong to what they themselves call the "realist school;" they are Henri. Murger, !Alexandre Dumas fils, Champfleury, Ernest Paydeau, Gustave, Faubert, Octave Feuillet, and Edmond About. Poetry is far from being as popular in France as the novel, and the country has produced few great poets during the present century. The four greatest poets are Béranger, Victor Hugo, Lamartine, and Alfred de Musset; besides whom, Casimir Delavigne, Auguste Barbier, and Victor de la Prade, over the only names requiring to be mentioned. History is, tigne, Anguste Darbier, and victor de la France, brethe only names requiring to be mentioned. History is, undoubtedly, the most successful branch of modern French literature. A larger number of valuable historical works has been published within the last thirty-five years than during any other equal period of its history; and the taste for such performances is still on the increase. M. Guizot, the great philosophical expounder of social institutions, and Augustin Thierry, the artistic historian of the middle ages, stand foremost among the promoters of this movement. Sismondi, Michelet, and Henri Martin, have each devoted their efforts to a full recital of the general history of France; while De Barants, after giving, in his "Histoire des Duce de Bourgogne" (1824), an attractive specimen of purely marrative history, has recently published histories of the Convention and the Directory, in which his monarchical tendencies are strongly apparent. The revolutionary period has engaged the attention of many historians; among whom the most prominent are Thiers, Mignet, Michelet. engaged the attention of many historians; among whom the most prominent are Thiers, Mignete, Minchete, and Louis Blano. Lemartine also figures among the historians, having produced several works of that class, which, however, are more remarkable for their showy language than for their accuracy or research. The elegant and accomplished Villemain, although better known in the field of literature, has also preduced several bistorical works as his Wistorians. also produced several historical works; as his "Histoire-de Cromwell," and his "Sourenirs Contemporains."

As a lecturer and a critic, no man has contributed more to the diffusion of enlarged literary doctrines, healthy principles, and good taste. Archaeology has

not heen neglected; as is evinced by the works of Letrone, Racul Rochette, and Beulé. Champollion, Sylvestre de Sacy, Ernest Renan, and Abel de Rémusat have thrown great light upon Egyptian and oriental languages and literature. In philosophy, Victor Cousin and his disciples have, under the name of Eelectism, brought back the materialism of the preceding age to spiritualist principles. Jouffroy, Damiron, and Jules Simon are among those who have contributed to this Simon are among those who have contributed to this result. As writers on politics and political economy, are Joseph de Maistre, Bonald, Ballanche, Lamennais, Miobel Chevalier, De Tocqueville, and Laferrière; while as socialists, figure the names of St. Simon, Fourrier, and Pierre Leroux. Auguste Comte, in his "Cours de Philosophie positive," offers a connected system of philosophy, embodying ideas derived from Hegel and various of the French socialists. The various branches of natural philosophy bases of matural philosophy bases of matural philosophy bases of matural philosophy bases of matural philosophy. of natural philosophy boast of many original and powerful writers. In natural history, are Cuvier, Geoffroy St. Hilaire, Isidore St. Hilaire, and others; mineralogy boasts of Elic de Beaumont, Bendant, and Dufrenoy; bossts of Elie de Beaumont, Bendant, and Dulrenoy; and chemistry and physics, of Thénard and Dumas, Gay-Lussac and Despretz. In medical literature, are the names of Bichat, Broussais Corvisart, Magendie, Trousseau, and many others. The mathematical sciences have distinguished representatives in Lagrange, Laplace, Ampère, Biot, and Arago. The French essayists and literary critics are legion, and some of they here attained each still content of the conte essayists and interary critics are legion, and some or them have attained great eminence; among whom we may mention Sylvestre de Sacy, St. Marc Girardin, Philarète Chasles, Ernest Renau, Hippolyte Rigaud, Gustave Planche, Ste. Beuve, Charles de Kémusat, Albert de Broglie, Edmond About, Théophile Gautier, Léon Delaborde, and Jules Janin, the dramatic feuilletonist. For the last few years, however, French literature has been on the decline. The literary move-ment, which commenced with the Restoration, seems to be now nearly exhausted; and although there has been little falling off in intellectual activity, the rising generation of writers are not on the whole equal to their predecessors.—Ref. Histoire littéraire de la France, by Dom Rinet, and other Benedictine monks, continued by members of the Institute, 22 vols. (1733-1858); Histoire littéraire de la France avant 1133-1646; † Motore merdere de la Trance acant 1-12 Siccle, by Ampère; Tableau de la Littérature au Moyen Age, by Villemain (1857); Essais sur l'Histoire littératre du 16me Siècle, by Girardin and Chaeles; Histoire de la Littéraire Française, by Demogest

FRENCH-POLISHING, a method of polishing flat surfaces with a solution of gum or gum-resin in spirit. For this purpose the polish is made more fluid than the hard-wood lacker used in polishing turned surfaces, in order that it may spread easily and dry less rapidly. As the friction is derived entirely from the motion of the hand in French-polishing, more time is required the nand in Frence-poissing, more time is required than in polishing turned works. There are a great many recipes for making French polish, which vary greatly, as some prefer it very thin and others tolerably thick. One of the simplest methods is to dissolve 14 lb. of shell-lac in: I gallon of spirits of wine without heat. Copal, sandrac, mastic, and gum Arabic are sometimes employed. It is usual to make

without near. Copas, sandrac, mastle, and gum Arabic are sometimes employed. It is usual to make the varnish thicker than is required for use, and to thin it down with spirit when being used.

Fernch Purple is the name applied to a beautiful colour, cliedly manufactured by MM. Guinen, Marras, and Bonnet, of Lyous. It is prepared as follows:—The lecanoric, crythic, evernic scids, &c., of the lichens, are extracted by digestion with ammonia; the mass is pressed, the solution precipitated by a mineral soid, and the precipitate collected, washed, and re-dissolved in ammonia by the sid of heat, whereby a solution is obtained, which, on exposure to the air at a temperature of 19° or 20°, generally assumes a very bright-red colour. As soon as the tint has acquired sufficient intensity, the liquid is introduced into shallow basius, and very slowly evaporate to the attach into the contact with the sir, the liquid, after a few days, acquires a very deep violet colour, which undergoes

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and rick garnet-colour, which, when collected on a filter and washed to remove the shine mother liquid, constitutes French purple. . Bo far as regards fastness and resistance to the influence of light, French purple is certainly superior to amiline purple.—
Ref. Ure's Dict. of Arte, Manufactures, and Mines, 6th edition.

FRENZY, fren'se (Fr. frénésie, Gr. phrenitis, from phren, mind), denotes madness, distraction, rage, or any violent agitation of the mind approaching to distraction.

traction.

FREQUENTATIVE, fre-kwen'-tid-tiv (Lat.), in Gram., is a term applied to certain verbs, which denote the frequent repetition of an action.

FRESCO PAINTING, fres'-ko (Ital. freeco, fresh), the art of painting in water-colours on the surface of a wall that has just been plastered, while the plaster is still in a wait condition. Freeco painting as a wall had a wall that has just been plastered, while the plaster is still in a moist condition. Fresco painting can only be managed with success by those who are proficients in the art, as it does not admit of any degree of finish, as paintings which are executed in oil, or water-colours, on canvas or paper; and no corrections can be made, if any part of the work presents an unsatisfactory appearance when the entire painting is completed. The Romans were in the habit of colouring their walls The Romans were in the habit of colouring their walls while the plaster was still wet, to produce a ground of one uniform tint; and they added decorating in distemper colours when the surface was perfectly dry. But, although it was to new thing to cover walls when wet with colouring matter which would preserve its original brilliancy of tint unimpaired for a considerable lapse of time, yet freese painting, properly so called, cannot be considered to have been introduced earlier than the large of the lath century when the practice. cannot be considered to nave been introduced earlier than the close of the 14th century, when the practice of painting designs on the damp surface of freshly-plastered walls was adopted for the decoration of cathedrals and churches at Florence, Orvieto, Piss, and other towns in Northern Italy. Freeco painting plastered walls was adopted for the decoration of cathedrals and churches at Florence, Orvieto, Pisa, and other towns in Northern Italy. Freeco painting was subsequently practised by all the Italian painters of celebrity,—Michael Angelo, Raffaelle, and others, having left exquisite specimens of their work in this branch of art in the palace of the Vatican and many of the churches of Rome. Freeco painting seems to have taken the place of encaustic painting in the 15th century for the interior decoration of large buildings (see ENCAUSTIC PAINTING), the introduction of the former art having caused the decline of the latter. It fell into disuse about the end of the 16th century, and remained in absyance until some German painters revived the art in the decoration of a villa at Rome about 1816; and Louis of Bavaria subsequently caused many of the magnificent buildings that were exected at Munich during his reign to be adorned in this manner. Freeco painting has been used for the decoration of many of the apartments and corridors in the new palace of Westminster; and a good example may be seen in the hall of Lincoln's Inn, which covers an area at the overs the reverse that the overse and of the halling of 1700 annay feet. the hall of Lincoln's Inn, which covers an area at the north end of the building, of 1,700 square feet. It nerin end of the building, of 1,700 square feet. It may be executed on any walls covered with a coat-ing of plaster. Stone walls are, however, considered to be the worst of all kinds, as they are upt to condense the damp on their surface; while walls of brick or lath-and-plaster are the best. Frescoes should never be painted on walls built with mortar mixed with sand from the sea-shore; and every precaution should be from the sea-snore; and every precaution should be taken to prevent damp rising in walls from the ground below, by placing sheet lead, coated with pitch, between any two of the lower courses of the material of which they are composed. The frescoes at West-minster are executed on lath-and-plaster, the walls behind being covered with slate, against which battens behind being covered with slate, against which battens are fixed, to which the laths are nailed. The lime need for making the plaster, especially that of which the intonaco, or ground on which the painting is executed, is composed, should be as pure as possible, approaching as nearly as may be a pure carbonate of lime, without any admixture of iron or other mineral substances. The best limestone for the purpose found in Englandis that which is quarried on Durdham Down, near Bristol. When the stone has been calcined, the lime should be kent for some time before it tion in contact with the sir, the signal, steers lew days, blown, near littled). When the stone has been calculated as very deep violet colour, which undergoes cined, the lime should be kept for some time before it no further change, even by the action of saids. The colour solution, supersaturated by a strong soid yields a copious flocculent precipitate of a very fine from the air. If the lime is used too soon, the plaster

#### Frets

is apt to rise and break away from the surface in some places, and the toke of the colours will be injured. As freeco paintings cover 'a large superficial area, it is necessary to execute them at different times in several necessary to execute them at different times in everely allows, as much of the intonece or surface being spread at one time as the painter can donveniently colour before it begins to harden; and it is contrived, if possible, to let the joint between the work of one day and that of another correspond with the outline of a figure, or with that of the drapery that is thrown around it. It is necessary that the walls on which frasco paintings are to be executed should have the first and accord coals of plaster put on at least two or, three years before the ground is applied for the reception of the painting. Before painting, the wall must be thoroughly soaked with water, and two very thin coats of the intonece spread over it, both consisting of prepared lime and very fine river-sand, but the sand preponderating in the mixture used for the first coat. The design, of which the painter has a finished sketch already prepared, is then traced with a hard blunt tool on the intonece, from carcious laid on it, as soon as it; is hard enough to withstand the action of the brush and receive the colour. The outline having been thus produced, the colouring is applied in washes, half as hout, or rather less, being allowed to elapse between the application of the successive washes, when two or three are necessary to produce a proper depth of tint. Roundness is given to figures, and the proper effect of light and shade is produced by cross-hatching; and the whole is toned down by washes and glazes, all of which must be done while the plaster is the plaster is the most or must be careful to abstain from adding more colouring matter when he finds that the plaster is the roundness of the successive washes, when two or three are held to the done while the plaster is the most of the most of the successive when he finds that the plaster is the most of the most of the successive when he finds that the plaster is the most of the successive when he finds that the plaster is the most of the successive when he finds that the plaster is the mos pieces, as much of the intenses or surface being spread from adding more colouring matter when he finds that from adding more concurring matter when he industrial the plaster is throughly charged with moisture and unable to receive any more. The colours used are prepared from coloured earths and a few minerals, such as the oxides of iron and cobalt. Vegetable colours, or those made from animal matter, such as colours, or those made from animal matter, such as gamboge and Prussian blue, cannot be used, as lime has an injurious effect upon them. There is another kind of freeco painting, called freeco secco, or dry freeco, in which the whole of the ground is spread on the wall before the painting is commenced, the surface being moistened with lime-water before beginning to paint, and kept damp during the operation. Freecoes may be cleaned with bread or sponged with
water when the surface appears dirty; and there is a
process by which they may be detached from the wall
on which they are painted, and transferred to canvas.

—Ref. Taylor's Manual of Freeco and Encaustic
Painting; Eastlake's Materials for a History of Painting in Oil; English Cyclopadia—Arts and Sciences.
FERTS, frats (Ang.-Sax.), in Mus., are short pieces
of wire placed across the finger-boards of stringed
instruments under the strings, to mark those portions
of them which are to be pressed on the finger-board
with the fingers of the left hand, for the purpose of
producing certain sounds. to paint, and kept damp during the operation.

with the fingers of the left hand, for the purpose of producing certain sounds.

Falls, fri'ar (Fr. frère, brother), is a common term applied to monks of all orders, founded on the supposition that there is a kind of brotherhood existing between the religious persons of the same monastery. More particularly, it was applied to those of the mendicant orders, of which the principal were the four following:—Pranciscans, Minors, or Grey Friars; Augustines; Dominicans, or Black Friars; and Carmelites, or White Friars. In a more poculiar sense, friar is restricted to such monks as are not priests; the latter being usually dignified with the appellation of father.

of father.
FRIARS OBSERVANT (Lat. Fraires observantes), were FRIARS OBSERVANT (Lat. fratres observantes), were a branch of the Franciscane, who separated themselves from their brethren of that order, on the ground of a laxity of discipline, and lived apart in places of their own choosing. They were so called because, although not living together in any convent or corporation, they agreed among themselves to observe the rules of their order more strictly than the conventuals did.

Friction, frik-shan (Lat. frictio), in Mech., the resistance which a moving body meets with from the surface of the body on which it moves. As no surfaces are perfectly smooth, the imperceptible asperities, which may be supposed to exist ongil surface, however highly polished, become to some extent inter-

## Friendly Societies

locked, and a certain amount of force is requisite to oversome the mutual resistance to motion of the two surfaces, and to maintain the sliding motion even when it has been effected. By increasing the pressure, the resisting power of friction is increased; while, on the other hand, by rendering the surfaces more smooth, and by lubrication, the resistance to motion is diminand by lubrication, the resistance to motion is diminished, although it cannot be entirely avoided. Strictly, friction should not be called a force, except in a negative sense. In a general sense, the tendency of force is to produce motion, or, if it does oppose motion, it is only in virtue of a tendency to produce motion in the opposite direction. The peculiarity, however, of triction is, that it tends to destroy motion in every direction. Friction is essentially a passive resistance, a negative force, produced by pressure, to which it bears such relation that its amount may be measured by the same unit, and he cannot the same terms. The such relation that its amount may be measured by the same unit, and be enunciated in the same terms. The principal laws with regard to friction are as follows. Law I.—The friction bears to the pressure upon the surfaces in contact a ratio which is constant for the same materials with the same condition of surfaces. Thus if the surface of one body be pressed upon that Interest the surface of one body be pressed upon that of another with a certain force, and if that force be doubled, the friction will be doubled; if the pressure be tripled, the friction will be tripled, &c. Law 2.—The measure of friction is independent of the extent of surface, the pressure and the condition and characters of the pressure and the condition and characters of the pressure and the condition and characters. ter of the surfaces remaining the same. Law 3.—The friction is entirely independent of the velocity of con-tinuous motion. These laws, although stated in reference to the movement of two smooth surfaces, are equally true with regard to the rubbing parts of every machine. It is always found that the friction is greater

machine. It is always found that the friction is greater between substances composed of the same material than between the surfaces of heterogeneous bodies. Fairnnix Societies, of Bankeri Societies, frend-le (Sar. frend, friend), are voluntary associations of persons, whichy of the humbler classes, for the purpose of forming a fund, by mutual contribution, for the assistance of members in the case of sickness or other distress. It is acquely possible to overwate the imassistance of members in the case of sickness or other distress. It is scarcely possible to overrate the im-portance of such institutions, if founded on correct principles, either to their members or the community at large. Sickness, death, and other misfortunes, which are so uncertain in their occurrence to any one, may, when applied to a number, be made the subject of pretty accurate calculation, and thus be provided against. The poor mun, then, by contributing a small sum periodically to such a society, will have the astisfaction of knowing that he will thus have the means of meeting and high-times. raction of knowing that he will thus have the means of meeting such misfortunes, whether they come soon or late; while in this way, provident habits and a spirit of independence are fostered, and the commu-nity are saved from what might have otherwise fallen to be a burden upon them. In other words, friendly to be a burden upon them. In other words, friendly societies are mutual assurance associations. Each member contributes a certain sum weekly, monthly, or annually, while he is in health, and receives a ceror minusity, while he is in heating, and receives certain allowance or pension when incapnoitated by sickness or old age. It is to be regretted, however, that many of these excellent insultutions are founded upon erroneous principles, and have seculted in disappoint. The contingencies which require to I vided for ought to be carefully calculated, otherwise they may soon find that their funds are by no means adequate to meet the various claims that are brought against them. (See INSURANCE.) The origin of friendly societies has been traced to the guilds which existed societies has been traced to the guids which existed in the middle ages. Mr. Turner, in his "History of the Anglo-Saxons," says "The guids, or social corporations of the Anglo-Saxons, seem on the whole to have been friendly associations, made for mutual aid and contribution to meet the pecuniary exigencies which were perpetually arising from burials, legal exactions, penal mulcts, and other payments or compensations." The beneficial results that attend such associations have lest the government, from time to time, to pass statutory enactments in their favour. In 1793, an act was passed authorizing such societies to be formed, and to draw up regulations for their government, which, on being examined by the justices at quarter sessions, and found not to be repugnant to the laws of the realm, were to be confirmed and made binding upon the subscribers. They were also releved

from the payment of certain stamp duties, and ampowered, in the recovery of moneys and certain other, and powered, in the recovery of moneys and certain other, asses, to proceed by summary necess. Several acts were subsequently passed, northering still further benefits upon them, and in 1820 and 1820 which sometimes of the Rouse of Commons were supported to consider the laws on friendly-necestics. In consequence of their reports, an act was passed in 1826 (19 Geo. IV. c. 58), which reported all previous acts on this subject. This, with two subsequent acts (5 Will. IV. c. 37, and 4 £. 5 Will. IV. c. 39, established these contains on any forting, and obliged them to submit a statement of their pulses and resultaine for the approval of an officer heigs entitled to claim the benefits of those acts. It is, however, unaccessary to mention these, as the whole of the previous enauments on the subject were repealed and consolidated by 18 £ 18 Vict. c. 63. This act applies to all societies established for any of the following purposes:—"1. For issuring a sum of money to be paid on the birth of a member's child, or on the death of a member, or for the funeral expenses of the wife or while of a member, or for the funeral expenses of the wife or while of a member, or for the funeral expenses the following way.

money to be paid on the birth of a member's come,
on the death of a member, or for the funeral expenses
of the wife or child of a member. —2. For the relief,
or maintenance, of the members, their husbands,
or maintenance, or the members, their husbands,
and the members or nicoes, or maintenance, of the members, their husbands, wives, children, brothers or sisters, nephews or nicoes, in old age, sickness, or widowhood; or the endowment of members, or nominess of members, at any age.—3 of members, or nominees of members, at any age.—3. For any purpose which shall be authorised by one of her Mijasty's principal socretaries of state; or, in Scotland, by the Lord Advocate, as a purpose to which the powers and facilities of this act ought to be extended; provided that no member shall subscribe or contract for an annuity exceeding thirty pounds per annuar; for some payable on death, or any other contingency, exceeding two hundred pounds." Under this act three registrars are appointed; one for England, one for Ireland, and one for Scotland. Any persons wishing to establish a society of this description may make rules for that purpose, two copies of which must be made out and transmitted to the registrar; and when perfified by him, as conformable to law and to the said act, one of them is to be returned to the conjety, and the other is to be kept by the registrar. Upon being so certified, the rules take imto he society, and the other is so be kept by the register. Upon heing so certified, the rules take immediate effect, and are binding, in point of law, on all parties governed. "The trustee, or trustees, of such societies are required, from time to time (with the consent of the society), to invest the fund, either an action that or in the orbits. savings banks or in the public funds, or in such other manner as in the sot set forth; and all real and per-sonal situate helonging to the society shall be vested in sound state belonging to the society shall be vested in the trustee or trustees, and their successors, without any conveyance or assignation whatever, except in the case of stock in the public funds, which shall be transferred into the name of any new trustee or trustees; and in the swent of the death, bankruptcy, or insolvency of, or process issued against, any officer of the society, having its money in his hands, a priority of payment is secured to the institution. It is also provided, that if any officer of the society, or other person, shall, by false representation or imposition, obtain shall, by false representation or imposition, obtain possession of any pasperty of the society, or, having the asme in his possession, shall withhold or misapply the same in his possession, shall withhold or misapply the same in his possession, shall withhold or misapply the same; the money may be recovered, and the oftender subjected to a penalty by a summary proceeding before quotienes of the peace; and that applications for the resolution, or for the settlement of disputes (where there is no other prescribed method), shall be made to the county court of the district within which the usual or principal place of business of the society shall be estimate, and that the declation of such court shall not be simulate, and that the declation of such court shall not he subject to he made a written explication in made by at least the appeal. —(Stephen's Commentaries on the subject to he made a written explication is made by at least the sprincipal place of the areas; and it he finds the registers is to investigate the same; and it he finds the mount of the final and constitution of the final sed constitution is believed by governance, and not appealable. According to the Paris of the same is subject to be investigate for any parison of the final and constitution of the final and constitutions and final and constitutions. The part from which the final and constitution of the final and constitution of the final and constitutions. The part from which the final and constitution of the final and constitution of the final and constitutions. The final and constitutions are also for the said carried to the final and constitutions. The final and constitutions are also for the said carried to the final and constitutions.

Fringe-machins

ment from, and interest are dised to, the trustees of the ficindity societies of the United Engdom up to the 18th of Norember, 1888, was \$5,831,192. 188. Act 28th of Norember 1888, was the Principal country of Principal towns in recessions upon Priendly Bodecker a being held. The Commission with in all the principal towns in uncession, and ramines withsees associated with the various side and burial assisting, respecting the sendition and disposal of the funds, to.

Held North of Nor below the cornice of an apartment.

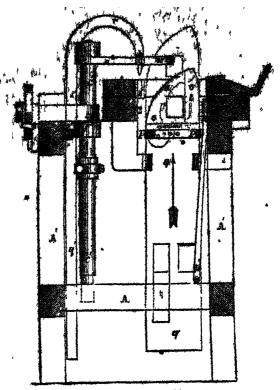
FRIGATE, frig-ut (Fr. frégate). Formerly, the name frigate was only known in the Mediterraneau, name frigate was only known in the Modifetraness, and applied to a long vessel or galley, propelled by oars and sait; in the present day, however, frigate signifies a fast-sailing ship of war, with two gun-decks; which lies between the two classes stoop and time of buttle skip, and which mounts any number of guns from swenty up to fifty, which latter number is seldom exceeded. All the armour-plated vessels which have been duilt have been equipped as frigates,—such as the Warrior, the Northumberland, the Adulties, &c.

Fargarane (Freque Agesles, Rey), a bird common on the intertropical American cousts, and in the Atlantic and Ferific occaus. It is allied to the commonsts, but differs from them by having a forked tail,

rants, but differs from them by having a forked tail, short feet, the membranes of which are very deeply notched, an extraordinary spread of wing, and a beak, both mandities of which are curred at the tip. The poun manufacts of wines are current at the sty. The plumage is, on the upper parts purple-black, the throat and belly white, and the besk red. The frigate-bird is incapable of either swimming or diving; yet it manuages to saviely its natural appetite for fish with tolerable certainty: this is accomplished by a system of highway robbery, perpetrated on such gamets and sea swallows as may be returning with full pouches to their nests in the rocks. The common mode is for the frigate-bird to sear above its victim, and then, plunging down, to strike it on the head with its beak; the result down, to strike it on the head within heak; the result is an instant disgorging of the day's flashing, which, as it falls, is followed by the robber, who thramably overtakes and sources it before it reaches the water. The nest of this bird is usually built among the rocks, on solitary islands, or in high trees in retired situations. FRIOD ZONE. (See ZONE.)
FRIOD ZONE. (See ZONE.)
FRIOD ZONE. (See ZONE.)
FRIOD ZONE. (See ZONE.)
Massechate the particular of the twisting of frings for shawls has been patented by Mr. Whipple, of Lawrenge, Massechusetts. This machine is so constructed as to impact and perform the ordinary manual operations of dividing the years into proper quantities to form the two single strends,

Frange-machine

Fringe-mechane



Big. 1. SHAWL-PRINGS MAGNINE.



on the shaft s. This pinion and in Plate LII. This lead has one the top of one side of the flame shown at Plate LII. It is simply diagonal months: [s. this shade fitted in the opposite like a by dotted lines in Plate 1733. by dotted direction of that by morals white direction ?
with the man moved beautiful direction of a short it. them, a ful same arms of the facts of the same and in the foreign same of a state of the same arms of the sa directing spaces set at a proper intervadirecting spaces set at a proper intervasite sides of the simplification of a continuent of the direction of the same of the vertical state of the simplification of the same of the vertical state of the simplification of the simplification of the simplification of vertical security and vertically, no as to eliminately separate the vertical states a real sequence of the same of the simplification of the simplificati 4 The second of the property of the second of 

ted lines; and after the two strands are suffidrawn downwards, tingers in its ting on the treadle ected to the he separator is the separator in risted, at above part are moved as already derator is stator is b'o and or plates are i is operated. and the came gaprings and qq. ion. persono... 4, Plate ol .

illa, a chaiging to t shap pointed a comparison with It is well known at the west enown activity appro-different appearity bluer beak is nuts, &c., The line rosr known ee. Mr. en raignele known n which see. Mr. see British Birds, a the Uribah isles, see Sparson , Pas-ng , Loonethraustes ak. t of

### Frithiof's Saga

the Frisians is intermediate between the Anglo-Saxon and the Old North. Our knowledge of the eld Brissian is derived from certain collections of sixua; as the "Assgabuch," composed about 1200; the "Brokmerbriet," in the 13th century; the "Christian Domen," about 1300, and some officers. (But Brissian Domen, Fries. Rechtspellen, Gött, 1950.) The modern Friesan in now spoken only in 5ew districts, and some in the churchs or schools. It is further divided into a number of local dialects. Attempts have recently been made to review an interest in the Brissian, and various specimens of its earlier literature have been published. An excellent Dictionary of the old Friesan, by Richthofen, was published in 1840.

FRIENDOR'S SLASA, fride gris solve, an Icelandie myth, written down, appreently, about the end of the 13th century, but evidently belonging to a much earlier period. It marrates the surentures of the Nurregian hero Frithjof (properly Frighthejoft, i. e. peacestealer), and his love for the beautiful Ingeljörg, which some attribute to the 6th century, others to a much earlier period. Talls sags has been rendered famous, chiefly from being selected by the poet Tenfer as the subject of a beautiful poem of the same name, which has been repeatedly translated into English.

Frog. frog (Sax. froge), (Euxa).—The frogs are chiefly distinguished from the toxas by the unusual

has been repeatedly translated into English.

Face, Fee, (Sar. Feeg.), (Eura).—The frogs are, chiefly distinguished from the toads by the unusual length of the hind feet, which are strong and well-palmated; hence, their great power both of jumping and of swimming; their aim also is smooth; and there is not only a row of fine teeth round the upper jaw, but the palate also is furnished with another row placed transversely. It is one of the many singularities of these animals, that while in the young or tadpole state, they are harpiverous, living only, according to Cuvier, upon aquatic plants, yet no somer do they effect their upon aquatic plants, yet no somer do they effect their upon squatte plants, yet no somer do they effect their metsmorphosis, than they become carnivorous, pursu-ing slugs, insects, &c., and consuming them alive or dead. The frog deposits its ova or spawn some time in March, in a clustered gelatinous mass. This lives for a month or five weeks, and at the end of that time, there issues from each little black globule a living tadpole. issues from each mass change the young frogs have an elongated body, a laterally-compressed tail, and external branchise; their small mouth is furnished with small hooks or teeth, for the separation of vegetable matter, and the laws lin, by which branchies; their small moth is furnished with small hooks or teeth, for the separation of vegetable matter, and they have a small tube on the lower lip, by which they attach themselves to aquatic plants, &c. The external branchise next disappear, and become covered with a membrane, being placed in a sort of sac under the throat; and the animal them breathes after the manner of the flahes. Furnished with eyes and mostris, the body of the animal is distended with the great extent of the digestive canal, and it has a large tall for swimming. Soon, however, the posterior limbs are gradually put forth near the origin of the tail, and are developed first; the anterior feet then begin to show themselves; the tall gradually becomes less and less, shortens, shrinks, and seems at last to be absorbed; the mouth videns, and loses its horny processes or jaws; the eyes are guarded by eyelids; the belly langtheses and diminshes in comparative size; the intestines become abort; the true lungs are developed, and the internal branchisms of obliberated; the circulation undergoes an entire change; and the antmal, hitherto entirely aquatic and herriverous, becomes carnivorous, and for the most part terrestried. In the freg the muscular system, especially the muscles of the abdominal structure of the muscular some analogy to the abdominal structure of the muscles of the thigh and leg; in the fregs and other annound harronisms, that the greatest singularity is manifested. These, whether testem conjunity or singly, present the greatest analogy with the muscular structure of the manneliers. But it is in the disposition of the muscles of the thigh some and the remedia, clongsted, conteal thigh, the knee extending itself in the same dark to the leg, formed by the helly of the gastroomorii muscles. It is impossible to watch the intrincial motions of a frog in fire water, as it is implied, by these muscles and its wealth feet, without teing struck by the complete resemblance in this portion of its firence muscles. and they have a small tube on the lower lip, by which

### Fronds

to human conformation, and the almost perfect identity of the movements of its lower extremities with those of a man making the same efforts in the same situation. By the said of these well-developed fiver limbs, and the gradigious nower of their muscular and bony levers, a free team raise itself in the air to twenty times its own leading the same raise little in the air to twenty times its own leading and traverse in a single bound a space nearly fifty times the length of its own body. There are several species of frees, and among the most peculiar may be mentioned the buil-free of North America (Hana rejeises) and the tree-free (Hyla leverage traves). The former is a very large apecies, measuring sight inches in laught and four in width. Its colour is olive as the upper part, and greenish-white darket specings only, and, although it is a great destroyer of young goalings, it is interested from the beautits derived from its accordance from the beautits derived from its accordance. Each of the peculiarity is its vices, which resembles the distant bellowing of a buil. Of the tree-free there are several species. They are found in France, Germany, and itsly, as well as in America and asia. Eays fir filmerson Tennent, "In the shrubberies around my house at Colombo, these graceful little frees were to be found in great numbers, crouching under broad leaves, to protect them from the scording sun. Some of them utter a sharp metallic sound af night, like that produced by smacking the lips. They possess in a high degree the power of changing their colour; and one which had seated himself on the gilt pillar of a dimer-lamp was scarcely to be distinguished from the ormain to which it clung. They are enabled to ascend glase by means of the suckers at the extremity of their toes. Their food consists of flies and minute coloepters." Although this latter species live in trees, they lay their means of the suckers at the entremity of their toes. Their food consists of flies and minute coleopters. Their food consists of flies and minute coleopters. Although this latter species live in trees, they by their eggs in the water, and even hybernate in the mind during the winter. Africa also posduces a singular race of frogs, which, from having some of their toes enveloped by a conical horay diaw or cap, have been ermed Dactylethre, or thimble-toed—Ref. Broderin, Swainson, Tennent, Yarrell, English Cyclopedia.

Fao. Trans. (See Annua Frant.) In Bot., the leaf of a fern or other acctyledomous plant. Fronds are seldom articulated; they are either sessile or stalked; are frequently toothed or incisal in various ways, and are often highly compound.

Fao.nus., frond (Fr., a sling), in the history of

articulated; they are either seesile or stalked; are frequently toothed or incissed in various ways, and are often highly compound.

FROWING, frond (Fr., a sling), in the history of France, is the name of a political faction which sprang up during the minority of Louis LLV,, and opposed themselves to the government of the prime minister, Cardinal Mazaria. The people opposed to the court party were called Frondeurs, or Consurers, on account of the censures which they passed against the government; and hence they acquired the name of the Fronde. The despoile policy of the prime minister had given offence to all clauses of the people; and at leugth the parliament rose in open opposition to him, and refused to pass or register his measures. In consequence of this, the cardinal ordered the arrest of the president and one of the councillors on 26th August, 1646. The people of Paris immediately took up arms against the government, and the following day (to journée des berrieddes) batricaded the streets, and compelled the Mercation of the two prisoners. Peace was thus in some measure restored; but if was not of long continuance, for the prople still continued tunultuous, and in January, 1649, the queen regent removed with her son to St. Germain, charging the primes of Conde to blockade the city. Among the leaders in the popular cause, were the prince of Conde, the duices of Beaufour, Neuroura, Vandôme, Longueville, the Cardinal delete, Marabai Turanne, and many offsers of Hearing, and the removed army of August. In January, 1649, the queen and continued them to be arrested, by which proceeding the remain of August. In January, 1650, the queen offended by the conduct of the photes of Ocuade and Conti, coused them to be arrested, by which proceeding the remain of Ocuade and Conti, coused them to be arrested, by which proceeding the remains of Ocuade and Conti, coused them to be arrested of the soverment. Turanne was defeated at Residues for the soverment.

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after; but at length, all parties being wearied with these dissensions, the court agreed to remove Mazarin, and a general amnesty was produced. Condé, who refused to be a party to these terms, new finding his cause desperate, entered the Spanish service; while Mazarin after a time returned to Paris, and again obtained the refuse of government.—Bef. Sist. Aulaire's Histoire de la France. 3 vols, Paris, 1827.

FRONKLI, Front'-di (Lat. Franc. 18 forchead), at the frontal bone, arteries, nerves, to. The frontal bone is that bone of the skull which goes to form the forehead; as well as part of the temples, the upper portion of the

as well as part of the temples, the upper portion of the nose and orbits, and part of the base of the stull. It is convex anteriorly and concave posteriorly, resem-bling somewhat in stape the half of a cockle-shell. On the inner surface there is a ridge, hardly perceptible at the upper part, but becoming more prominent towards the bottom, to which the falx cerebri is attached. The frontal sinus is a cavity, usually occurring between the two plates of the frontal bone behind the eyebrow, and

two plates of the mose.

FROWNIER, front-yeer (Ital frontiera), is the boundary of a state, or the lands immediately adjoining its boundary. It is of great importance to a country to have a strong frontier, so as to reader it little liable to any sudden attack, and to make it easy of defence. The best frontier is the sea, and the next best great moun-tains or rivers, as the Alps or Pyrenees, the Rhine or the Rhone. These are termed natural boundaries, as distinguished from artificial or conventional boundaries, or such as are determined merely by treaty. Prussi has the worst frontier of any European state, and would find it very difficult to protect itself in the event of a continental war.

FRONTISPINCE, front is pees (Lat. frons, front, inspicio, I look upon), a term need to denote the engraving or ornamented page which is placed in the beginning of a book. In Arch., frontispiece signifies the principal face or front of a building, and the decorated entrance to the same.

FROST. (See PRENELING.)
FROST.-BIFE. (See CHILBLAIN, GANGBENE.)
FRUCTIODS. (See CHILBLAIN, GANGBENE.)
FRUCTOSS, OF FRUIT-SUGAR, fruit-toxe (Lat. fructus, fruit), in Chem., C., H., D., a, a sugar found in most ripe fruits, and producible from starch and ligneous bodies, by acting on them with dilute sulphuric acid

(See SUGARS.)

(See SUGLES.)

FEUT, frute (Fr. fruit, Ital. fruite), in Rot., that
part of the plant which is formed by the ripening of the
overy and its contents, after the process of fertilization. The fruit consists essentially of the mature overy. with its seeds or ripened ovules; but other parts of the flower may enter into its composition. Thus in case where the calve is adherent to the ovary, as in the apple, melon, and gooseberry, that organ necessarily forms part of the fruit; in the rose, the concave thala-mus, which bears the carpels on the inner surface, be-comes a portion of the fruit; in the strawberry, again, the fruit dozsists of a succulent hemispherical thalamus, the fruit donsists of a succulent hemispherical thalanus, bearing the carpels on its convex surface; in the acorn, hazel-nut, and filbert, it consists of pistil, calyx, and bracts, combined together; while in the pineapple, it is composed of the ovaries, floral envelopes, and bracts of several flowers. As the ovary ripens into the fruit, it frequently undergoes important alterations, from the addition or the obliteration of certain parts. Fruits formed by a single flower are divided by Professor Bentley into simple, amountages, and sengarous fruits. The fruit is simple, apocarpous, and syncarpous fruits. The fruit is simple when it is formed of a single earpel, and when it is the only one produced by the single flower. The legame and the drupe are examples. The specarpous fruits are formed of single carpels, but several are produced by a single flower. The follicle, achanium, and eterio are examples. Those fruits are syncarpous which are formed by the more or less complete combination of two or more carpels, and of which only one is produced by a single flower. The exceptions, asmark, capsule, heaperidium, berry, and pome, are examples. Fruits formed by the combination of several flowers, form a distinct class. They are sometimes flowers, form a distinct class. They are sometimes called anthocorpous fruits. The cone and symcoms are examples. Professor Beutley's classification is founded upon that of Dr. Lindley, but differs from it in some many countries at the present day, the principal fuel.

particulars. The fruit is described as superior or in ferior, in the same sense as when speaking of the overy. Thus a fruit is inferior when it is formed from an inferior ovary, in which case the only necessarily enters into its somposition, as in the apple and melon; it is superior when formed from a superior ovary, as in the poppy and pea; the only then being non-adherent. When perfectly formed, the fruit consists of two parts; When perfectly formed, the fruit consists of two parts; namely, the shell or pericery, and the inclosed seeds. In the majority of fruits, the pericary consists simply of the walls of the orary in a modified state; but where the calyx is adherent, it necessarily presents a more complicated structure. It is divided into three layers or regions,—the external, called spicary, or excoury; the middle, called mesocary, or sometimes, in allusion to its fleshy or succulent nature, the arrocory; and the inner, called the endocary, or, when very hard, the stone or pushumen. The pericery either opens to allow the seeds to escape, or it remains closed, and the seeds can only become free by its decay. In the former case, the fruit is said to be debiscent; in the latter, indebiscent. Debiscent fruits open in various weys. When a fruit separates more or less completely into two or more pieces, called values, or even when it opens by a more pieces, called values, or even when it opens by a single longitudinal slit, it affords an example of valueur deliscence. When the opening takes place by a transverse line through the fruit, so that the upper part is separated from the lower, like the lid of a pill-box, the deliscence is said to be transverse or circumscissile. A third kind of dehiscence, called porous, is distinguished. The seeds escape through little pores or slits, formed irregularly in the substance. irregularly in the substance of the fruits, by a process

called rupturing. (See Ovary, Sund.)
Frustum, frus'-tum (Lat. frustum, a morael or gobbet), in Geom. and Math., the name applied to any piece cut from any solid figure, but more particularly to the bottom of a cone or pyramid, from which the upper part, which contains the spex, has been cut

FUCESIA, fu'-che-d (SO BERREY IN BOLLING), a gen. a famous German botanist of the 16th century), a gen. FUCHSIA, fu'-she-d (so named in honour of Fuebs, of shrubs belonging to the nat. ord. Onagracea. species F. coccinea, a native of South America, was introduced into this country at the close of the last century, and is now one of our commonest greenhouse and window shrubs. It is a very elegant plant: the young wood and nerves of the leaves are tinged with purplish-red; the flowers are produced from the axis purpissis-red; the flowers are produced from the axis of the leaves, and baug in a most graceful manuer by thread-like pedunoles; the catyx is tubular, scarlet, and 4-lobed in the limb; the petals are equal in number to the divisions of the catyx, and of a rich purpis colour; the stamens are numerous, and, together with the style, form a pretty tassel. Many species have been introduced into Britain, besides R. coccioses, and an immense number of beautiful varieties have been developed by cultivation. The fruits of several fuchaias

loped by cultivation. The fruits of several fuchsias are somewhat acid, and may be eaten.

Fueve, fu'-kus (Gr. phukos, sea-wrack), in Bot, a gen of marine plants or Alga. Several species contain maunite; as F. vescoilosus, nodosus, serratus. The former, commonly known as the bea-wrack, is much used during the winter months in some of the islands of Scotland for feeding horses and cattle. The expressed juice of its vesicles has been used medicinally as an juice of its vesicles has been used medicinally as an internal remedy, and frictions of the plant have been employed externally in glandular and scrotulous affections. The substance called vegetable Ethiops, which was formerly much used in similar diseases, is a kind of obserced, produced by the incineration of this alga in close vessels. The beneficial effects of these remedies may be traced to the iodine contained in the close.

remedies may be traced to the iodine contained in the plant. The sea-wrack was formerly extensively employed for making help.

Furl, fw-el (Fr. fsv. fire), a term applied to certain substances used for the purpose of creating and maintaining heat; such as coal, coke, chevoel, wood, and a few other substances, which are burned in grates, stoves, fireplaces, furnaces, to. The combustion of fuel is used either as a source of heat or of light. The processes connected with the latter will be found under the article far Manuscruus. With regard to the use of fuel for the purposes of heat, wood must have constituted, in the early ages of the world, as it does in many countries at the present day, the principal fuel.

#### Fueros

Another kind of fuel, which must have been used in accient times, ignest, or turf, a natural accumulation of vegetable matter. In many parts of England, Wales, and Scotland, where coal is not readily procurable, peat is still much used. Small deposits of peat are found in almost every country, but districts of immense extent occur in Holland, North Germany, on the Rhine, the peat is cut by common spades into the shape of thick bricks, and then dried. In Holland, the preparation of peat for fuel closely resembles brickmaking. In this country, the principal supply of fuel is furnished by coal, and its various kinds are employed in different ways and for different purposes, according to its nature, and that of the substance to be acted on yits agency. By partial combustion, both wood and Another kind of fuel, which must have been used in by its agency. By partial combustion, both wood and coal can be freed from their more volatile constituents, namely, oxygen, hydrogen, and nitrogen, leaving the carben more or less isolated. Wood so prepared is called charcoal; and coal, by a similar process, is converted into coke. Charcoal and coke burn for a longer period in a given bulk, and do not occasion any smoke. In some countries the excrement of animals smoke. In some countries the excrement of animals is used for fuel; and the formation of sal-ammoniso was derived, in Egypt, from the burning of camel's dung, the chloride of ammonium subliming from the excrement while it was burning. In small chemical operations tallow or wax candles are often employed as fuel; and at the present time, in laboratories, coal gas is simost entirely used for the purposes of boiling or evaporating small quantities of fluids, &c. Within the last few years, artificial fuel has been much manufactured. There are many methods; but the greatest number consist of processes by which small or dust bituminous coal, anthracite, charcoal, or coke, is made up into square or rectagonal blocks, which can be easily stored away without loss of room. The substances used for binding the dust-coal together vary. Sometimes it is mixed with earthy substances, such as sand, marl, clay, or alluvial deposit; or with some bituminous substance, such as mineral tar, coal tar, gas tar, pitch, resin, or usphalt; or with sawdust, coke-dust, or breese. A useful patent fuel is made by compressing peat so as to form a dense brown combustible solid and uselies the house said of the same said. tible solid, not unlike the brown coal of Germany. Some valuable information respecting fuel has been published of late years, in the government reports on the coals suited for the royal navy. The chief test of the value of any particular coal has always, in these investigations, been its avaporative power, or its power of converting water into steam. The best qualities of coal fuel for ships of war have been stated to be as follows :- 1. The fuel should burn with a quick action, so that steam may be raised in a short period .- 2. It should possess high evaporative power; that is, be capable of converting much water into steam with a small consumption of coal.—3. It should not be bituminous, lest so much smoke be generated as to betray the position of ships of war when it is desirable that the position of ships of war when it is desirable that this should be concealed.—4. It should possess considerable cohesion of its particles, so that it may not be broken into too small fragments by the constant attrion which it may experience in the vessel.—5. It should combine considerable density with such mechanical structure, that it may be easily atowed away in small space; a condition which, in coals of equal evaporative values, often involves a difference of enore than 20 per cent.—6. It should be free from any considerable quantity of sulphur, and should not progressively decay; otherwise, in either case, it is liable to spontaneous combustion. to spontaneous combustion.

Fugues, fa-ci-ros, is a Spanish term, derived from the Lat. forum, which signifies a place where justice is administered; and hence, jurisdiction. From this latter

# Fugitive-Slave Law

Basque provinces of Biscays, Alava, and Guipuzcos. It is in this last sense that the word is now almost exclusively used, the fueros of the other provinces and towns of flpain having long since become extinct. The subject has, in recent times, acquired a fresh importance, from having given rise to the revolution of 1833, in the Basque provinces, which led to a series of sanguinary conflicts, and which was only terminated by the queen and government, in 1844, entering into a formal recognition of the success these givens are based upon the of these provinces. These rights are based upon the sacient laws of the Visigoths, and were developed in the period between the fall of the Moors in the Spanish pennsula and the complete consolidation of the Spanish mouserby under the house of Hapsburg. The fueros thus owed their rise to the old Gothic laws, and se they took their form from the struggles between the people and their princes, they differ considerably in the different provinces. In 1236, in consequence of the contests carried on between the king Theobald and his cortes, the fueros of the kingdom of Navarre were collected and written down; and still exist under the name of "Cartulario del Rey Tibaldo." In Biscava, the fueros arose chiefly in the contests between the inhabitants of the counties and their counts. inhabitants of the counties and their counts. They were collected together in a book in 1971, by Count Juan, which was enlarged and improved by Corregidor Mora in 1452. After Biscaya became united with Castile, its fueros were, in 1526, revised and confirmed by Charles I. of Spain, who was also Charles V. of Germany. In the province of Alava, which went over from the government of Navarre to that of Castile, in 1200, the fuero of Logrono formed the basis of their purillarse, which were still crythay actorized in the spherosciples. privileges, which were still further extended in the sub-sequent contests of the Alayses with their Castilian lords, and were confirmed by the constitution of John II. of Castile. The province of Guipuzcoa received its II. of Castile. The province of Guipuzcoa received itsfueroe from the kings of Navarre, and they were subsequently confirmed by the kings of Castile, when that
province came under their dominion. The fueros were
thus received at different times, and in different forms,
in the several provinces; and hence they differ considerably, as regards their details, in the several provinces; but the main features are the same in all; the
form of government being essentially republican, and
the royal authority little more than nominal. In
Biscays, for example, the king has only the power of
nominating the corregidor, or chief magistrate; and nominating the corregidor, or chief magistrate; and ven his nomination requires to be confirmed by the junts of the province, a legislative body elected by almost universal suffrage, and intrusted with the chief management of public affairs. The inhabitants are exempt from all taxes and imposts, except such as they exempt from all taxes and amposts, except such as they vote themselves; and claim, by virtue of pure Biscayan descent, the privileges of Spanish nobility. They are not obliged to appear before any tribunal beyond the bounds of their own territory, or to allow any royal monopoly, or admit royal troops within their territory, or to furnish recruits for the royal army.

FUGITIVE, fu'-jit-iv (Lat. fuga, flight), is a person obliged to fly from his country, or remove from a place obliged to fly from his country, or remove from a place where he had some abode or establishment, on account of his crimes, debts, or other circumstances. In the Roman law, a fugitive slave was one that was given to fles or run away from his master; and in selling a slave, the master was obliged to declare whether or not he was fugitive.

FUGITIMS PLAYE LAW.—According to the constitution of the United States of America, Gaussian carif

tion of the United States of America, slaves, or, as it is mildly put, "persons held to service or labour in one state, under the laws thereof," fleeing or escaping into another state, shall be delivered up, on claim of the party to whom such service or labour may be due. The previous exactments on this subject have been administered; and hence, jurisdiction. From this latter The previous enactments on this subject have been sense it came, in Spain, to be transferred to collections amended, and to a considerable extent superseded, by of laws; thus the Spanish edition of the ancient "Lex Visigothorum" was called the "Fuero juzgo." From imposed by this act are to be performed by any United hence it came to be applied specially to the rights one. States commissioners who may have the power of imferred by the crown on particular cities, the most states commissioners who may have the power of imferred by the crown on particular cities, the most states commissioners as the respective concessions, pivileges, the word fuery came to be specially used in this sense, and to denote, in particular, the entire body of immunities and privileges which lar, the entire body of immunities and privileges which composed the constitutions of Navarre, and the three

#### Fugue

warrant and arrest from the officer having due authority, when the fugitive must be taken before a comrity, when the legitive-want be taken before a com-missioner or judge, whose duty it is to hear and deter-mine the complaint in a summary manner; and, upon satisfactory proof as to the identity of the fugitive that he is escaped and owes service to the claimant, it is the duty of such judge or commissioner to deliver to the claimant a certificate of the proceeding had, with authority to remove the fugitive to the place from which he had fled. The testimony of the fugitive is not admissible. Any assistance rendered to a furifive which he had belt. The destinanty of the lightly a not admissible. Any assistance rendered to a fugitive to enable him to escape from the claimant, or any obstruction offered to his arrest, is made penal, and also subjects the party to damages at the suit of the owner. All citizens are required, when called upon, to render the officers personal assistance when they may be resisted in the configuration. sisted in the performance of their duties. Such was the law on this subject previous to the commencement of the present unhappy struggle; but what the future enactments may be, still remains to be seen.—Ref. Kent's Commentaries on American Law. Boston, 1858.

Boston, 1858.

Fugue, fuge (Fr.), a term signifying a composition, vocal or instrumental, or both, in which a determined succession of notes, called the subject, passes successively, and alternately, from one part to the other, according to certain rules of harmony and modulation. There are four kinds of fugue; vis., the "strict fugue," in which the subject is given out by one part and answered by another, the subject being again repeated in the third part; the "free fugue," in which the composer is not so much restrained, but is repeated in the third part; the "free fugue," in which the composer is not so much restrained, but is allowed to introduce passages not closely related to the theme; the "double fugue," in which there are two subjects occasionally intermingled, and moving together; and the "inverted fugue," in which, as its name implies, the theme is inverted.—Ref. Dr. Crotch's Relements of Composition; Clementi's Practical Harmony; and the English Cyclopadia.

Fulcaux, full-krum (Lat.), the prop, or other support, by which a lever is sustained, or the fixed point about which a lever moves. (See Level)

Fulcaux, full-gol-ri (Lat. fulgor, an effulgence), a gen, of hemipterous insects, popularly known as lanternies, from their power of diffusing light in the dark. The American lantern-fly may be taken as the type of this family. The form of this insect is very remarkable. The head is dilated in front, with porrected protesters and the contractions of the samily.

or this family. The form of this insect is very remarkable. The head is dilated in front, with porrected protuberances; and it is from the hollow or lantern of the head that the light is said to proceed, and from no other part. "Two or three of these insects put into a glass vessel afford light sufficient to read by, without difficulty, if they be placed close to the bed. Even when the insects are dead, their bodies will afford considerable light, though less vivid than before; and if bruised and rubbed over the hands and face, they become luminous in the dark, like a beard smeared with English phosphorus."—(Nat. Hist. Guinea, Bancroft.) Madame Merrian, in her work on the insects of Surinam, was the first to draw attention to this insect. "The Indians," says she, "once brought me, before I knew that they shone by night, a number of the lanternies, which I shat up in a large wooden box. In the night they made such a noise, that I awoke in a fright, and ordered a light to be brought. We soon found that the noise came from the box, and opened it, but were much slarmed, and instantly let it fall to the ground with affright, on perceiving flames of fire issue from it; for as many animals came out, so many flames appeared. When we found this to be the cause, we recovered from our terror, and again collected the insects, much admiring their splendid appearance."

FULER'S EARTH, fall-lers erth, in Min., a porous soft silicate of alumina, having a strong attraction Madame Merrian, in her work on the insects of Surinam,

soft silicate of alumina, having a strong attraction for greasy matters. If made into a paste with water, and hid upon a greasy spot, it removes the fatty or oily matter by capillary attraction. It is found abun-dantly at Reignte, in Surrey. It is largely used to cleanse woollen fabrics from the grease contained in

cleanse woollen labries from the grease contained in the wool from which they are made.

FULTIMATING GOLD, full-min-at-ling (Lat. fulmen, a thunderbolt), in Chem., a fulminating compound of gold, made by digesting teroxide of gold in solution of ammonia, the formula of which is said to be Au<sub>8</sub>O2NH<sub>3</sub>HO. A similar fulminating compound is obtained by substitute of the said of

## Fumariaces

tuting terchloride of gold for the teroxide. A fulminating compound of platinum is obtained in the same manner by digesting sulphate of binoxide of platinum with ammonia. If simply precipitated oxide of silver, while still moist, is placed in contact with ammonia for any hours, a great part is discoved and a black or while still moist, is placed in contact with ammonia for some hours, a great part is dissolved, and a black compound remains, possessing powerful fulminating properties. It is regarded by chemists as a nitride of silver, Ag. N. These compounds all require investigating; but on account of their dangerous properties, they have been somewhat avoided by chemists. They must not be confounded with the fulminators, which are compounds of the metals with a true acid.

pounds of the metals with a true acid.

FULMINATING MERCURY, in Chem.—This compound, which is largely employed in the manufacture of percussion-caps, is made by dissolving one part of moreury in twelve of nitrio acid, apeo, grav. 0.35, to which are added eleven parts of alcohol, spec. grav. 0.850. On applying a gentle heat, by means of a water-bath, a violent reaction takes place, during which metallic mercury is separated, and in a short time grains of the fulminate also appear, which, when cold, are carefully washed with water. The composition for filling percussion-caps consists of six parts of nitre and one of the mercurial sult, made into a thin pasts with water. When curial salt, made into a thin paste with water. When wet it is harmless, but requires great precaution in

wet it is narmiess, but a value in the handling when dry.

FULMINATING SILVER, in Chem.—There are two compounds of silver known by the name, both of which are explosive by simple friction. The first, which is considered by some chemists to be nitride of silver, is considered by some chemists to be nitride of silver, in annuonis, considered by some chemists to be intride of sirer, is prepared by dissolving protoxide of silver in animonis, and adding solution of potash or soda; a black micaceous deposit falls, which is allowed to dry in minute quantities, on separate morsels of filtering-paper. The second is fulminate of silver, and is formed when nitrous acid is transmitted through saturated solution of nitrate of silver.

FULMINATION, full-min-ail-shun (Lat. fulmen, a thunderbolt), is employed in a general sense as synonymous with denunciation; but it is more particularly applied to the anathemas or excommunications burled

applied to the anothemas or excommunications hurled from the papal see against offenders.

FULMUNIC ACID, ful-min'-ik (Lat. fulmen, a thunderbolt, from the noise produced by the explosion of its compounds), in Chem., an acid possessing the same composition as cyanic and cyanuric acids, but having totally different properties. It is not known in an isolated state, but it forms compounds with the metals nossessed of nowerfully explaine properties. isolated state, but it forms compounds with the metais possessed of powerfully explosive properties. The best known of these, the fulminate of mercury, is used for priming percussion-caps. The fulminate of silver is also sometimes used as a detonating powder, but its use is attended with much greater danger than the corresponding salt of mercury. The latter is prepared by dissolving one part of mercury in twolve of mitric said to which elevan parts of slephal are added nitric acid, to which eleven parts of alcohol are added. On the application of a gentle heat, a violent reaction takes place, nitrous ether escaping, and fulminate of

takes place, nitrous ether escaping, and fulminate of mercury being gradually formed.

FUMAGE, fu'-māj (Lat., fumus, smoke), was the name of a tax formerly levied in England, and vulgarly known as smoke farthings. It is mentioned in Domesday Book, as being paid by custom to the king, for every chimney in the house; but it was first established by statute in England by Charles II. (13 & 14 Car. II. c. 10), when an hereditary revenue of 2s. for every hearth, in all houses paying to church and poor, was granted to the king for ever. It was, however, abolished upon the revolution, by 1 Will. & Mary, c. 10.

FUMARIAGEE, fumi-re-ni-se-e, in Bot., the Fumi-try fam., a nat. ord. of Dicotyledones, sub-class Thalamiflora, consisting of 15 genera and shout 110 species, principally occurring in thickets and wasto places in the temperate latitudes of the northern hemisphere. They are smooth herbs, with a watery juice, and alternate, exstipulate, much-divided leaves; flowers very irregular and unsymmetrical, purple,

flowers very irregular and unsymmetrical, purple, white, or yellow; sepals 2, deciduous; stamens hypo-gynous, usually 6, diadelphous, or 4 distinct, always opposite to the petals; ovary superior, with parietal placentas; ovules horizontal, amphitropal. The Funariaceæ possess slightly bitter, acrid, astringent, disphoretic, and aperient properties. Some species are cultivated in our gardens and greenhouses. Of these

## Fund, Sinking

the most important is Diosetro spectabilis, which has vary shown but seenther flowers. The order is named

the most important is Diosecto spectabile, which has very showy but seemines flowers. The order is named from Functio, one of the genera.

Furn Functio, one of the genera.

Furn Functio, one of the genera.

Furn Furnat., fon-di-ment-dif (last, fundows, the bottom of a thing), in Mus, is a term applicable to either a chord ar to a note; to the former, when its lowest component part is the nets the which the introduced in the second of the laster, when it is both the lowest compituent part of a chord and the note from which the harmony is really and nominally derived.

Furni, or Furning System. (See Marional Deri).

Furnat. (See Burlin.)

furnat be regulated by custom and the condition of the deceased. If the executor or administrator be extraorgant, it is a species of devastation or waste, and shall only be prejudicial to himself, and not to the creditors or legatees of the deceased. It seems that, according to the law of England, the widow has no claim for mournings, either against the executor or creditors of her hasband; but, in Seotland, mournings to the widow and those of the children who resided in family with the deceased are valid charges.

Furnal Cartons.—The sustom of delivering

family with the deceased are valid charges.

FUNDRAL GRATIONS.—The sustem of delivering funeral orations on the occasion of the death of any distinguished person is of very great antiquity. They were in use among the ancient Greeks and Romans and were very common among Christians in the early ages of the Church. The funeral orations (Gratons Funders) of Bossuet and Fischier are justly celebrated for their sloquence.

Funderes) of Boseuet and Flochier, are justly celebrated for their eloquence.

Furar, fin'ji (Lat.), in Bot., the Mushroom fam., a nat. ord. of dootyledones, sub-class Thallogene, consisting of parenchymatous cellular plants, growing in or upon damp mould; in or upon the wood and the herbaceous parts of living or dead plants; upon living or decaying animal substances, and in solutions of organic materials. A great number of species are microscopic plants. The vegetative structure of every fungus consists of a mass of exceedingly delicate, jointed and branched, colouriess, interlacing filaments, forming a kind of cottony or fetty mass when grewing in the ground. This vegetative structure, called the successium or spawn, nouriable a reproductive structure, which respectively include the mushrooms and their allies, the puff-balls, the smuta, the mildews, the truffles and morels, and the moulds. (See Agarious, Amantia, Lycoferdon, Cordina, Turner, Morghella, Princullivin).

Funcois, final grey (Lat.), in Surg., is a term applied to any luxuriant formation of flesh on an ulcer, commonly known as proad flesh. It is also applied to act and excreacential.

soft and excrescential.

soft and excrescential.

FUNGUS MINITANES, mc-ll-ten'-sis, the name used by the pharmacologists to designate a parasitic plent which formerly had a great reputation as a styptic. Its botanical name is Gymonorism concineme, and it belongs to the nat. ord. Bolemophoraces.

FUNGULUS, fundit-telus (Lat. funds, a cord or cable), in Bot., the stalk by which the svale or the seed is attached to the placents. When this stalk is absent, the seed is said to be seasile. (See OVUR. SEED.)

FUN, fur (Fr. fourture), the long, fine, silky hair of some wild animals, as the bear, wolf, marten, beaver, which is dressed and prepared as an article of dress. Fur being one of the principal non-conductors of heat, it is an especially warm covering, and those fure are Fur being one of the principal non-conductors of heat, it is an especially warm covering, and those fura are the best which belong to animals which inhabit cold climates. The furs which are imported may be classed in two different sections,—the falled fur and dressed fur. The first section comprises the furs of the hare, rabbit, beaver, and nutrie; and these are principally used for hatmaking. Dressed furs are principally used for intraking. Dressed furs are those which are preserved along with the felt to which they are attached, and are used for thatmaing of articles of dress, mulliers, rugs, mantles, and such-like. Furs are imported into this country from North America.

### Furnace

and Russia, and the trade is a very important one, as above 5,000,000 akins of fur-hearing animals are annually brought into Britain. The Russian sable is one, of the most expensive, some single skins fatching 59, although the average price is between £3 and £5. The Hudson's Bay Company was established in the yest 1870, by an especial charter from Charles II., for the purpose of carrying on this trade in North America, by means of kunters sent out for the purpose, and by tradic with the numerous wild tribes of Indians, which at that time populated nearly the greater part of America. Quebec and Montreal are the principal trading stations of the company. The operations by which furs are manufactured into a fit statefor the covering of hat, 5c, is retermed "intriery," and are carried on in the following manner. Feited fore, for hets, are first spread out so as to exhibit a fit surface, and the skin is combed with a kind of saw bermed a rake, so as to cleanse off any impurities without detaching any of the hair of far itself. The being achieved, the skin is then damped on the inner surface, and the six is then damped on the inner surface, and severalers preceds the advent and take out reads it than perfectly smooths and area and take out achieved, the skin is then damped on the inner surface, and severalere pressed together in the gross, so as to render them perfectly smooth and even, and take out any oreases or folds. The next process is to separate the furry cost from the felt underneath. The coating is of two kinds,—long lairs, which are not strictly fur, and a shorter cost underneath, which is the true fur required. These are separated by a long pair of shears, which first detaches the long rough hair. The real fur is then removed by a much more delicate operation. The skin is extended and stretched perfectly even upon a cutting-board made of willow, which is coassionally wested to avoid blunting the knife used in the process. This knife is extremely sharp—in fact, is occasionally wested to avoid bluning the kinic used in the process. This kinic is extremely sharp—in fact, as sharp as a razor, and is about six inobes long by three broad, and it can be used either backwards or forwards, being shaped somewhat like a cheese-cutter. With this instrument the fur is separated from the forwards, being shaped somewhat like a cheese-cutter. With this instrument the fur is separated from the skin, the operator working down from the head to the tail (the natural direction which the fur takes on the animal to which it belongs), and it is then carefully collected and sorted out according to the different degrees of excellence which it possesses. It is now it for the purpose for which it is intended. Dresed fury.—The operation for this species is much more simple than that of felted furs, as the hair or fur has not to be removed from the felt. Only two processes are mecessary,—that of cleaning the skin from all impurities, and extracting a species of oil from the fur itself. The skin is first steeped in a liquid composed of bran, alum, and salt; it is them worked about and soured sufficiently to remove all particles of grease which might still adhere to it. The fur is then washed several times with sods and fine soap, after which it is regularly cleaned in cold water repeakedly. The alum having rendered the skin soft and pliable, and the fur being fully prepared, the dressed fur can now be made up into the different garments and trimmings for which it is to be used. The use of furs seems to have been first introduced into Europe about the 6th century, about which spoch ashle skins were brought to Rome from the shores of the Arctic Ocean by northern inveders. They appear to whave been in regular use in Ragiand in the 14th century, as we learn to Rome from the shores of the Arctic Ocean by northern invaders. They appear to have been in regular use in England in the 14th century, as we learn that Edward III., in the year 1337, commanded that none of his subjects should wear them unless they had an income of £100 annually. The Hudson's Bay Company even still have the pre-eminence which they had some two centuries back, as their system is so was that they command nearly avery market. They hold annual they command nearly every market. They hold annual sales in London in the month of March, and many manes in account in the month of march, and many foreigners come over for the express purpose of pur-chasing fara, which are disseminated over Europe through the agency of the grand fair at Leipsic. It is asserted, in a capital article on the subject in the English Encyclopadia, that the value of furs used in Europe every veer cannot be much less than 27,000,000.

Baglish Encyclopadia, that the value of fur used in Rurope every year cannot be much less than 27,000,000. Furlows Darvine. (See Darvine, Furlows). Furlows, fur-long (Sar. furlows), an English mea-sure of length, which denotes the eighth part of a sails, or 250 yards. Furlows, fur-lo (Du. verlof); in Mil. language, the leave of absence granted to any officer or man to absent himself from duty for any length of time. Furlaces, fur-not (Let. furnar), an inclosed fire,

### Furnace

the draft to which is only supplied at the bottom, and that with considerably increased velocity to compared with the common grain. Paraness are not been compared with the common grain. Paraness are not considered to the constant of the c

sulphurse acid manufacturers of the sountry, and one of the largest of these manufacturers, Mr. Vivian, has sulphuric acid manuscrimes. Mr. of the largest of shees manuscrimes. Mr. proposed to sekieve this original by seem insections invention which has been insected in the contract of the contrac proposed to schieve this origint by necessing a most regenious invention which has been measured by a few man. M Gustenholder. This iscusses statusate of a rectangular shamber silled with the sop of the farmers, and so arranged that no two term incommends a time and so arranged that no two term incommends a time that the sop of the farmers, shall be directly over this analysis, the sop of the farmers, and so it is a finely-lighted and the supply is regulated by nighting dead-solline, it and the supply is regulated by nighting dead-solline, and the supply is regulated by nighting dead-solline, and the supply is regulated by nighting dead-solline, and the cover the first root of bear, and as the cop dalls throught, it piles upon them smith it will not look a write, and fails then on the row of face helds it had been wret, and fails then on the row of face helds it had been wret, and fails whole formace. Between the head-rails and the here are channels in the side of the farmace, by which the products of the religible for the farmace, by which the products of the religible for the farmace, by which the products of the religible for short the farmace, by which the products of the religible for the farmace, by which the products of the religible for the farmace the more perfect will be the colonspation—there is no open space, into which, at the commencement of the calendation, a grate with some tignited face—any word or charcoal—is introduced, said this fire is well fed with the lumid the charge is thoroughly ignifed, when the grates is withdrawn, and the charge burns by theses of the ignition of the aniphies volved. The combustion is the top of the furnace away into the sulphure-noid chambers. The shannels by which the general reconducted are so arranged as to heat the current of cold air farced into the bottom of the furnace, falls into a space below, from which it can be drawn off into cous arr reroes into the bottom of the lurinose. The calcined one beving persed through the furnace, falls into a space below, from which it can be drawn off into waggons, and so transferred to the next operation.—
(Mechanic's Magasens.) "Gas has been employed of late with much advantage for heating crussiles, and many forms of burners have been introduced for the number of producing and better the number of producing and the second second." 

cannot be factorial, an addite fault rescaping the almost in favour.

Fuzz, that flash factor, from field, I pour out), a tube filled with an inflammable composition, chiefly used for exploiting shells. There are two hinds of faces, one made of word, and the other of metal. The ferm of both sorts is that if a sylinder, slightly couled in charge the amalier and being that which is inserted into the shell. The excellent interest made of close-grained wood, well seened beach being mast commonly used for the purpose. A hale about a ginet commonly used for the purpose. A hale about a ginet in the disappear in a cup-shaped carrier of the spirit of the surject extremity, it is exterior of the sylinder is marked with rings 4 men expert, which serve to regulate the length of time for which the fine shall turn before the explosion of the character is a substance of the which there is allocated the insight of time for which the fine shall turn before the explosion of the place. This is effected the insight, or in grant cannot be end of the fuse, which extracts him hall, are by grant and of 1 inch per second. The engage children with which which

Fusil

The bere of the fuse is filled is formed of one part of sulphur to \$ 25 of nitro, and 1 % of mealed powder; it is ramined tightly into the bore, and the cup at the integer extremity is filled with perming, which ignites when the shall is filled, with perming, which lightles when the shall is filled, the lane is heammered limity into the shall is filled, the lane is heammered limity into the shall is filled, the lane is heammered limity into the shall is filled, the lane is hear and in the narry, arctimate in three sizes, and opsirroched to serve into limits for the sizes, and opsirroched to serve into limits for the sizes, and opsirroched to serve into limits for the sizes, and opsirroched to serve into limits for the sizes only. Fuses have shown in the sizes, which have for the seconds only. Fuses have shown in the lane is seen intended by fire William Armstrong and Captain Bross, & A. In Bir W. Armstrong's fuse, the time of the explacion of the deal on he required by a graduated plate, attached to the larger end; but in that made by Captain Borer there are three bores entering the true benefits of the sides of the cylinder, communicating with the sides of the cylinder, communicating with the shouthers that contain the powder. These holes are bored 1 inch spart in each row, these in one erw entering the fuse sterned with part, by which the time Between the discharge of the shell and its explosion can be regulated with greater precision; for as the holes that enter the chambers filled with powder are stopped with party, explosion at any required time can be secured by borng into the composition through that hole in the exterior of the fuse to which it will have barrid down at the time decired for the explosion, the flame of the composition through that hole in the exterior of the fuse to which it will have barrid down at the time decired for the explosion, the flame of the composition through that hole in the exterior of the fuse to which it will have barrid down at the time decired for the explosion. have-burnt down at the time desired for the explosion, the flame of the composition rushing through the hole that has been made in the side of the plug, and firing the powder in the chamber and that with which the shell is charged. In the old fuse, which was bored completely through from ead to end, the composition often tell out when it was hazamered into the chell, and the explosion of the shell was in consequence, either prevented altogether or delayed; but in Captun Boxer's tuse, the occurrence of this mischance is obviated by rushing the smaller end of the cylinder solid, and allowing the fire which ignites the charge in the shell to find an issue through the side of the fuse instead of its extremity. have burnt down at the time desired for the explosion. extremity.

extremity.

FUSEL, OF FOUSE. Ott.. (See FOUSE. Ott.)

FUSIDLE METAL, ful-es-bl (Fr., from Lat. fusem, from fundo), an elloy of bianuth, composed of one part of bianuth, omnosed lead, and two oi tin. It has the property of fusing below 212°, and expanding as it cools, rendesing it of great value to the dic-anker, who is thus enabled to take a sharp cast of his work as it progresses, at a samparatively low temperature. An alloy of cadmitm, im, and lead mets at a till lower temperature, and se known as Wood's fusible sectal. meial.

FOREM C-reary, fel-ring, in Chem.—The following is a neighboured the fusing points of well-known substances.

	Fahr.	
Mercury	890	
OH of Viterol	86	(Regnault).
Bromine	ä	for a Brown and a
Ico. to the second property of the second	82	
Phosphorus	111 5	(Behroctter).
Potestiam ,	181	(monto().
Wax me constraintentalistation		(Person).
Sodia dieneinenentrarenentraren	190	(* 2220)4
Lodine	294-6	
Bulphur	230	
	451	
Billiotta as a presentation and processes as	512	
Mitrate of Bods	891	_
	620	•
Figure of Potentanian and	642	
	773	(Daniell).
Time on equipment to react the street	900	(matter).
Siver marginal engineers the manager		**
CONSCE AND A DESCRIPTION OF A DESCRIPTION OF	1996	49
The state of the s	2016	44
describe Tabbitteridin consideras medias is.	2786	**
	8290	17
British Advant   For Shadle & bin		rblack similar

Frien, Area (Fr. fasil), a kind of Britock similar to the old market, but lighter and shorter. Some of

Fusiliers

the light infantry regiments in the British army were armed with this weapon prior to the introduction of the Enfeld rife, from which they acquired the fishinative appellation of fusiliers. Of these, the String Boyal Welsh Fusiliers, raised in 1888 or 1898, is perhaps the most distinguished. The 7th and first regiments were also raised adoptaths time, so the English and Scotch Fusiliers, when the fault was first introduced from France, having should been in use in shat occurry, for about half contary. One of the regiments of the foot-guards, or households troops, is also distinguished as the Stots Fusilier Fusical.

FUSILIESS. (See Fusil.)

FUSILIESS. (See Fusil.)

FUSILIESS. (See Fusil.)

FUSILIESS of the initial in manufacture to velvet, having, in addition to the warp and Well, a species of pile, consisting of other threads doubled together, which are throws up in ridges and conceal the original

of pite, consisting of other threads doubled together, which are thrown up in ridges and conceal the original warp sad weft, which are the groundwork of the fabric. When in the loom, this pile presents the appearance of a set of loops; but these are afterwards out in two and sheared down. The fustian, when polished and finished, presents an evenly ribbed surface on the exterior. The best gescriptions of this class of roads are those known as cotton-wavet and surrace on the exterior. The best gescriptions of this class of goods are those known as cotton-wivet and velveteen; but, besides these, there are moleskin, conducty, and several other kinds. (For further information on the subject see Willyland.)

FURTLAM, in Criticism, is applied to a forced, bombatic style of writing, abounding with metaphors or other rhetorical figures.

other rhetorical agures.

FUSTIO, fust-lik (Sp. fusts).—There are two kinds of fustic used in dysing,—old fustic, which is the good of the Morus tindorie, and young fustic, which is obtained from the Rhus Cotinus. They are both valuable for dysing woollens yellow, and for impacting to them green and olive bues when mixed with indigo. (See

green and olive bues when mixed with indigo. (Nee Macture and Rays.)

FUTURE DEET, in Law, is a debt payable at some future and fixed period. Such differ from contingent debts, in that the payment of them is fixed, whereas in the other case payment depends upon some contingency. In the case of the death or bankruptay of a debtor, future debts are allowed to rank on the estate, interest at the rate of five per cent. being deducted for the period that has to elapse before the debt becomes strictly payable. strictly payable,

G.

G is the seventh letter in our alphabet, as well as in the Latin and all the other alphabets derived from it; while in the Greek and Oriental alphabets it occupies the third place. It has two counds,—one hard, as in gay, go; the other soft, as in gam, giant. It is hard before the vowels a, o, u, and soft before a and a. It thus resembles, which has the double sound of k and it is the seventh of the seventh o thus resemples s, which has the noble sound of k and s. G is liable to many changes in different dislects or languages, as interchanging with \$\mathbb{R}\_i, \mathbb{y}\_i, \mathbb{y}\_i,

and Italians.

G Fair, the note O depressed half a tone; the fifth note introduced in modulating by fourths from the

Casling to the flexibility of the osiers or brushwood that are used in making the gabions, are driven into the ground at equal intervals round the circumference of a circle traced thereon, with a radius of eleven inches, that the outer diameter of the galion may not arged two fast when it is completed. The willow rods, or any either material that can be obtained which is suicable for the garpose, are then twisted between and about this station, such successive layer of rods being tigffly pressed against the one below it, until the nearest work has attained the requisite height. The gabion is then pulled up, the calves are not off about the satisfied and the requisite height. The gabion is then pulled up, the calves are cut off about threadings from the thatest work at either and and charpened. Before Sebattopol, where brushwood was source, the stakes were intervoven with hoop from instead of withes, and the gual way. Tyler's gabion is a sheet of galvanised from, should be set in inches hook the contracted in the small way. Tyler's gabion is a sheet of galvanised from, should be set inches long and 2 feet 9 inches broad, that is brought into a circular form and retained in that position by passing a strong cord or wire through eyes punched along either end of the metal elset. Gabions are used in making earthworks. They are placed on and and filled with earth taken from the ditch dug out in front of the rampert. They add considerably to the strength of the mound, by affording supports to the strength of the mound, by affording supports to the strength of the mound, and the strength of the mound, the form of a considerably to the order that is from the direct strength one line of gabions is placed on top of another, a row of fascines is generally placed between them.

Ganza, gail-bl (Welsh gavesl), in Arch., the name given to the upper part of the end-wall of a building, the sides of which meet in an angle and afford support to the ends of the rafters of the roof. The angle thus formed corresponds to the slope of

and finial, which generally assumed the form of a cross in churches and buildings designed for exclosiational purposes. In Elizabethan architecture, the outline of the gable was composed of curves and angles variously the gable was composed of curves and apples variously combined, that known as the orges gable being the most common. It was often richly ornamented with open stonework. The sloping sides, particularly in old Scotch, Dutch, and German buildings, were sometimes finished in the form of a saries of steps, which, in Scotland, were termed "cubic steps," In domestic Gothic architecture, the roof generally projects beyond the face of the gable-wall, and an ornamental burge-board is attached to the end of the rafters. The end of a hones serminating in a gable is indifferently called the gable or gable-end of the building, as in the title of one of Hawthorne's best tales, "The House of the Seven Gables."

Seven Gables.

one of Hawthorne's best tales, "The House of the Seven Gables."

Gan, ghd (Ang. Sar.), a sharp-pointed wedge, used in Cornwall for splitting rocks.

Gan-Fix. (See Bor-Fix.)

Ganting, gai-de-de (Lat. gades, a cod-fish), a fam. of fishes of the soft-finned order; as the Cod. They are easily known by the position of the ventral fins under the threat and the pointed character of those fins. The bodysislon, rathes compressed, and covered with small soft scales. The head is scaleless; eyes lateral; jaws and anterior part of the somer furnished with several ranges of unsqual testin; the gills large, 7-rayed, and opening laterally; a small beard the tip of the lower jaw. Most of the species have the dorsal fin contained in two or three bundles; they have also fins behind the vent, and a distinct caudal fin. The greater number of the species live in cold or temperate seas, and furnish the greater portion the fish obtained is England and Americs. Their productive powers are very great, and the numbers in which they satisf in some parts of the ocean is perfectly incolubable.

Gantag, or Essa, Language and Interactures, gail-like. The language and the language of the language and and the language of the language and and the language of the language and and the language and language of the language and and and Interactures, gail-like. or Salve of the controlled of modelstring by fourths from the note introduced in modelstring by fourths from the natural or distonic mode.

Garstan, go-fet' (probably from the Ger. gobe, a spile of the salve of the women furshing alloyed to any tax or impost left upon commodities, but which afterwards come to be specially applied to any tax or impost left upon commodities, but which afterwards come to be specially applied to a subject of the loss come to be specially applied to a subject work of the loss of the species have the dorsal fin routened in two or three bundles; and the creating the controlled in the controlled fine the continued in the controlled specially and the controlled in the controlled of the subject of the first obtained in the construction of section of the first obtained in the construction of sections. These has been determined to the controlled of sections of the first obtained in the construction of sections. These has a first body and anterior part of the women furnished with several ranges of the species have the dorsal fin routened in the orthogories live in the right of the loss of the species have the dorsal fin routened in two or three bundles; and they are also fine behind the vent, and a distinct candid fin. The greater number of the species live in roductive powers are very great, and anterior part of the women furnished with several ranges of the continued in two or three bundles; at the tip of the lower law. Most of the species have the dorsal fin routened in two or three bundles; at the tip of the lower law. Most of the women furnished with several ranges of the sev

Gaelic

the Gwyddelian or Gaelic, and to which belong also the Irish and Mass, or that spoken in the Isle of Man. According to Dr. Prichard, the Celts are of Eastern origin, belonging to the great Indo-European family. They arrived before the Teutons from the regions on the Oxus, and from Madia, and penetrated through the Allophylic races along the southern shores of the Baltic Sea, at a time of which we have no historic data. At the time of the Roman invasion, Celtic was the language generally spoken in Western Europe. The dialogts of the Celtic still spoken, besides the three directly mentioned, are the Wesh, and the language of Brittany; while the Cornish, another dialect, though not now spoken, is preserved in books. The three dialects, the Irish, the Scotch Gaelic, and the Manx, approach each other so nearly as to form, in fact, but one language, the peculiarities which distinguish them from each other not being sufficiently broad or vital to constitute either of them a tilatinot language. The differences between the spoken language of the Scottish Highlanders and the Irish exist purity in the pronunciation, partly in the grammar, and partly in the idioms. In the vocabulary, also, there are also marked differences in the language, as spoken in different parts of the Highlands; and a native of Sutherland has some difficulty sin understanding one of the southern districts of Argyle. The Gaelia, which, from a variety of causes, has retained, in a considerable degree, its original purity, is copious, bold, and expressive. It derives no assistance from the languages either of Greece or Rome, from which it differs in its structure and formation. Having affixes and prefixes, it greatly resembles the Hebrew, particularly in the inflections of its nouns and verbs. In Ireland, too, the Gaelia spoken in the different parts varies, and an intimate connection subsisted between that wo countries. For nearly four centuries, from about the Highlands and the north of Ireland were, at an early period, inhabited by the same race or races, and an intimate connection subsisted between the two countries. For nearly four centuries, from about the middle of the 12th to nearly the middle of the 18th century, according to Mr. Skene, "there was not only a close political connection between the western Highlands and islands and Ireland; but the literary influence was equally close and strong; the Irish senachies and bards were heads of a school which included the west Highlands, and the Highland senachies were either of Irish descent, or, if of native origin, resorted to bardio Highlands, and the Highland sennacines were evicer or Irish descent, or, if of native origin, resorted to bardio schools in Ireland for instruction in the language and the accomplishments of their art." A powerful influence must thus have been exercised upon the language and literature of the Highlands, which must language and literature of the Highlands, which must have become by degrees more and more assimilated to that of Ireland. The written and cultivated language of the Highlands thus came to be identical with that of Ireland; but, according to Mr. Skene, we have no reason to conclude, on that account, that there was not a vernacular Gaelio which preserved many of the independent features of a native language, and existed among the people as a spoken dialect. The introduction, however, of the Reformation, in the 16th century, ever rise to a religious literature, which, commencing gave rise to a religious literature, which, commencing in the written, or Irish Gaelic, gradually approached nearer and nearer to the spoken dialect of the country, and, accompanied by the preaching of the clergy in the vernacular dialect, tended to preserve and stereotype the language spoken in the Highlands in its native form and idiom. The first printed book in Gaelic was a translation of the form of prayer issued by John Knox, and wrinted at Ediphurch, 1867. The second a translation of the form of prayer issued by John Maor, and printed at Edinburgh, 1867. The second was a translation of Calvin's Catechism, published in Scot of the Apostle to Galatia are mentioned in the along with an English edition, in 1831. In 1859, the second of these that the epistle was written. Shortly Presbyterian syned of Argyle took up the work of issuing translations into Gashic of the metrical Psalms and of the Scriptures. In 1890, the first Bible was upublished for the use of the Highlands. All these works were in the Irish orthography and Irish dislect, authority, by attacking his character and asserting that he was not divinely appointed. Paul, therefore, the Bible, with a short vocabulary. The first work in his epistles, proceeds to controvert these errors, published in Scotch Gaelic was Baxter's "Call to the Unconverted," translated by the Rev. Alexander Mac-

farlane, in 1750, who, in 1753, also published the Psalms in Scotch Gaelic. In 1767, the art translation of the New Testament was published in the Scotch dialect; and in 1763, a translation of the Old Testament was undertaken by the Society for Propagating Christian Knowledge in Scotland, and completed in 1787. In 1816, a committee of the best Gaelic scholars was appointed by the General Assembly of the Church of Scotland to effect an improved translation of the Scriptures, the whole being published in 1826. The earliest specimens of Scotlish Gaelic poetry are preserved in a collection made in the beginning of the 16th century, by Sir James Macgregor, vicar of Fortingall and dean of Lismore, and now preserved in the Advocates' Library in Kdinburgh. A selection from it has recently (1862) been published, with translations, by the Rev. Thomas M'Lauchlan, and an introduction by Mr. W. F. Skene. Some of the poems are in pure Irish, others in pure Scotch Gaelic; and others in a mixed dialect, in which the one or the other idiom predominates. The MS. is of no mean literary value, as throwing some light upon the much-controverted subject of Ossian's poems. "It contains no fewer than twenty-eight-Cosianic poems, extending to upwards of 2,500 lines; nine directly attributed to Ossian, two to Farris or Forghus Filidb, and one to Caolie McRonan, the three bards of the Feine; two to Allau McRuadri, and one to Gillecallum Mac an Olla, bards hitherto unknown; and eleven poems Ossianic in their style and subject, to which no author's name is athitherto unknown; and eleven poems Ossianic in their style and subject, to which no author's name is attached." At is thus clear, "that the characters introduced into Macpherson's poems were not invented, but where really the subjects of tradition in the Highlands, and that poems certainly existed which might be called Ossianic, is relating to the persons and events of that mythic age;" and "that Macpherson had used many such poems in his work; but by joining separated pieces together, and by adding a connecting narrative of his own, had woven them into longer poems, and into the so-called epics." The Dean's collection affords a fair specimen of the poetic literature in the Highlands of Scotland before the fall of the Lords of the Isles, and the introduction of the principles of the hitherto unknown; and eleven poems Ossianic in their Highlands of Scotland before the fall of the Lords of the Isles, and the introduction of the principles of the Reformation.—Ref. The Highlanders of Scotland; their History, Origin, and Antiquities, by W. F. Skene, 1837. Also Mr. Skene's Introduction to the Book of the Dean of Lismore, 1862.

GAPP, grif (Irish grf), a kind of boom, employed in small ships to extend the upper edges of those sails which are secured to the masts by hoops or lacings, and which are usually extended by a boom below; such, for instance, as the mainsails of sloops, brigs, and schooners.

schooners.

schooners.

Galactodenden, găl-ăk-to-den'-dron (Gr. gala, milk; dendron, a tree). (See Brosinum.)

Galactomater. (See Lactomater.)

flower), in Bot., the Snowdrop, a gen. of the nat. ord. Ameryllidacest. The species G. nivals is found grow-ing wild in our thickets, and is much cultivated in borders for the sake of its early and pretty blossoms. It is a bulbous plant; the flower is solitary, white, and drooping, the inner segments being greenish. It is singular that no varieties have been developed from this favourite plant by cultivation.

singular that no varieties have been developed from this favourite plant by cultivation.

Galarians, Sr. Paul's Rifering to the specific about the year all of the canonical epistles of the New Testament, written, as is generally supposed, about the year all of the substitution of the canonical epistles of the New Testament, written, as is generally supposed, about the year all of the substitution of the epistle itself has never been called in question, and is frequently ofted by the apostolic and other early fathers. Two journeys of the apostole to Calatia are mentioned in the Acts of the Apostole, and if was probably after the second of these that the epistle was written. Shortly after his departure, Judaizing teachers appear to have some among them, preaching "another gospel" than that of Christ, and to whom they were giving heed. These teachers also endeavored to subvert the apostic's authority, by stacking his character and asserting

### Galaxy

doclaring that "though we or an angel from heaven preach any other goodel unto you than that which we have preached unto you, let him be accursed." He then proceeds to point out the relationship of Judaiam to Christianity; that they are now no leuger under the law but under faith, being made the children of God through faith in Jesus Christ; and erhouts them to "stand fast, therefore, in the liberty wherewith Christ halh made us free," and not to be "entangled again with the yoke of bondage." He also exhorts them not to fulfil the lust of the flesh; but to be led of the spirit, the fruit of which is love, joy, peace, &c. The number of commenteries on this spiatle are very numerous; among which may be mentioned those of Lutter, Winer, Rickert, De Wette, Allord.

GALMAN, (See MILKY WAY.)

GALMANUM, gill-dinum (Lat.), a fetid gum-resin used in medicine, internally as an anti-spasmodic, and externally as a stimulant and discutiont application to indolent tumours and chronic swellings. It

tion to indolent tumours and chronic swellings. It tion to indolent tumours and chronic swenings. It is imported from India and the Levant, having probably been brought down the Persian Gulf, and is usually met with in masses of a brownish-yellow colour, more or less translucent and shining. Botaniste have, as yet, been unable to determine the plant yielding this resin. Species of at least four different general training and the property of the have been suggested as the source by different writers. Galbanum is officiual in our Pharmacoposias, and is supposed to be the same substance as the chellenah

cripture. Galburn, gill-hu-lus (Lat., the nut of the coppressive), in Bot., a kind of fruit generally regarded as a modification of the cone. It is described and figured

under the head of CONE.

GALENA, gil-le'nii (Gr. galene, tranquillity, on account of its supposed effect in mitigating disease), an important mucral, forming the principal ore of lead. It is a protosulphide of the metal, and is found crystallized more or less distinctly in cubes of a deep leaden colour and strong metallic lustre. It is found in veius in crystalline rocks, and most abundantly in carbo-

in crystaline roces, and most sunnanny in carso-niferous limestone.

CALENIETS, gai'-les-ists, in Eccl. Hist., was the name of a religious sect, a branch of Waterlandians, Mennonites, or Anabaptists, which arose in the 17th century. Their founder was Galen Abraham Haan, pastor of a Mennonite congregation in Amsterdam, a nan of great penetration and eloquence, who was dis-ceed to law much proper stream two required the posed to lay much more stress upon practice than faith, and held that all who acknowledged the divine origin of the Old and New Testament, and led holy and virtuous lives, ought to be received into their communion.

GALERISIS, in Med. Hist., was a term applied to those who adhered to the system of Galen, more particularly as opposed to the Chemical school. The former ran much upon multiplying herbs and roots in the same composition, which they usually prescribed in the form of tinctures or attracts; while the latter dealt chiefly with mifteral substances, and professed, by means of various chemical processes or out of operations, to extract the virtues or essences out of them into a very small compact.

them into a very small compaes.

GALBRYERS, gittle-ri-deex (Lat. galea, a belimet), in Geol., a gen. of fossil sea-urchins, abounding in the Chaik formation, and from their shape popularly known in Kent and Sussex as "sugar-loaves." The shell is high, more or less conical, and oblong-oval at the base, narrowing towards the hinder part. These heliast-shaped echini can be found in the chalk clifts near Margate with little trouble.

GALTAGER. coll-coll-see. (from galium), in Bot. the

near Margate with little trouble.

Gallace, gill-e-ui'-se-e (from gallum), in Bot., the
Madder fam., a nat. ord. of Dicotyledones, sub-class
Corollifones, consisting of 10 genera and 320 species;
common weeds in the northern parts of the northern
termisphere, and also is the high mountainous districts
of Peru, Chill, and Australia. The order has the foltowing characters — Herbaceous plants, with whorled
extitudiate leaves and angular stems. Calyx apperior,
with the limb 4—3-lobed or obsolete; corolla monoretalous de Alebed members, stammers, eminetalous

## Gallery

albumen horny. The Galiaces are chiefly remarkable for the presence of a colouring matter in their roots. (See Rubla.) Some have valuable medicinal properties. (See Galium.)
Galipea, gd-le-pe-d, in Bot., a gen. of the rat. ord. Rutaces. The species G. officiadis and aspects vield the drug known as Angustura or Cusparia bark. They are natives of South America. (See Angustura BARK.)

SARK.)

GALIUM, gill-e-um (Gr. gala, milk, the flowers of one variety being used for curdling milk), in Bot., the typical gen. of the nat. ord. Galiacca. The species G. Aparius is the common goose-grass or cleavers. The inspissated juice or extract of this plant has been used with success in legra and some other cutaneous discass. The extracts of G. rigidum and G. Mollugo have been employed in exilence.

discasses. The extracts of G. regulum and U. Motungo have been employed in epilepsy.

Gallanter, gill-länders (Fr. galanteris), denotes bravery, heroism, intrepidity, notleness, as well as civility, or polite attention to ladies. It is easy to see how, in carlier times, when chivalry fostered alike valour and devotion to the fair sex, this word should have come to receive its double meaning. When the respect for ladies which chivalry cultivated decompanied more and more into frivious attentions. degenerated more and more into frivolous attentions, the word gallantry came also to be used in a less favourable sense; and at length it has come to receive a bad signification, as synonymous with lewdness or debauchers, though always recaining the meaning of bravery.

bravery.

Gall.-Bladder, gowl (Sax. gealla, gall; Lut. vesicula felliu), in Auat., is an oblong membranous receptacle, situated on the concare side of the liver, under the right lobe. It is about the size of a small heu's egg, and resembles a pear in shape. It has three coats,—an external or peritoneal, a middle or fibrous, and an internal or villous. The inner coat has a reticulated honeycomb appearance, but does not possess any follicles for the purpose of secretion. It serves as a reservoir for the bile, which, when digestion is not going on. regungitates through the cystic duct, serves as a reservoir for the bile, which, when digestion is not going on, regurgitates through the cystic duct, and is retained for future use. The cystic duct connects the gall-bladder with the hepatic duct, which proceeds from the liver, and the two, when united, form the ductus communis choledochus, by which the bile is conveyed to the ducdenum. The cystic duct presents internally a number of folds, which are generally an experiment of the cystic duct presents internally a number of folds, which are generally. rally circular.

CALLEON, gill-le-on, a name given by the Spaniards to a very large kind of vessel, with three masts and three or four decks such as those used by them in their commerce with South America, to transport the precious metals. In the Armada which was fitted out by the above nation in 1588 for the invasion of Engby the above nation in 1688 for the invasion of England, there were about sixty galleons. These were large, dumsy, round-sterned vessels, having bulwarks three or four feet thick, all of which were so encumbered with too hamper, and so overweighted in proportion to their draught of water, that they could bear very little carvas, even with smooth seas and light winds.—Ref. John Lothrop Motley's History of the United Netherlands.

GALLERY, gall-le-re (Dan. gallerie, Fr. galerie), in Arch., a passage open or closed on one cide, and having on the other side the doors of a series of apartments on the other side the doors of a series of apartments which open into it. In this sense it is synonymous with the term "corridor." In ecclesiastical architecture, the name is given to a floor midway between the ground-floor of the building and the roof projecting from the walls on either side, or at the west end, and supported on series of columns; or, if the span be short, a beam stretching from wall to well. They are used to obtain additional accommodation, but they are a reset disfluencement to obtain additional accommodation, but they are used to obtain accurate accommonation, but they are a great disfigurement to churches, especially when they are erected along the borth and south sides. The gallery at the west end of a church is usually set apart for the organ and choir. In theatres, the gallery is the range of seats above the upper boxes: it affords existipulate leaves and angular stems. Calyx superior, the worst view of the stage, on account of the great with the limb 4—0-lobed or obsolute; porella mono, equal in number to the lobes of corolla, and alternate equal in number to the lobes of corolla, and alternate with them; over inferior, 2-celled, with one solities of paintings, soulpture, and other works of art; and tary croot ovule in each cell; styles two; fruit 2-in Mar., to the balcony, that is generally made outside celled, indehiscent, with one exect seed in each cell; the stern of men-of-war and vessels of large size.

# Gallery

Gallican Church

GALLERY, in Mil. the narrow passage leading to a mine in which possibly is deposited, for the purpose of blowing up and electroying any portion of the fortifications of a town or siege-works. (See Mink.)

GALLEY, gill-le (Sp. galera), a low, flat-built vessel, much used in the Mediterranean See hefore

Galler, gall-le (Sp. galera), a low, flat-built vessel, much used in the Mediterranean Sea before the introduction of steamboats. They were long and narrow, fitted with two masts and lateen sails; and being propelled by ears as well as by sails, they were of great use in those long calms so frequent in the above-mentioned sea. The largest of the common galleys were about 166 feet long, 32 wide, and contained 52 cars. In the Spanish Armada, in 1588, four vessels, called galeases, were smployed, which were about one-third larger than the ordinary galleys, and were each of them rowed by 300 galley-slaves. "They consisted," says Motley, in his "History of the United Netherlands," of an enormous towering fortress at the tarro, a castellated structure almost equally massive in front, with seats for the rowers amidships. At stem and stern, and between each of the slaves' benches, were heavy cannon. They were gorgeously decorated. There were spiendid state apartments, cabins, chapels, and pulpits in each; and they were amply provided with awnings, cushions, streamers, standards, gilded saints, and bands of music. To take part in an ostentatious pageant nothing could be better devised; to fulfil the great objects of a war-vessel, to sail and to fight, they were the-worst machines ever launched upon the ocean."

Gallio Acin, gall-lik (from galls).—This important vegetable acid exists ready formed in the gall-nut, in

upon the ocean."

Gallio Acid, gall-lik (from galls).—This important vegetable acid exists ready formed in the gall-nut, in sumach, in valonia, and in a large number of other astringent vegetables. It is readily obtained by allowing an infusion of gall-nuts, or powdered gall-nuts firely moistened with water, to stand in a warm place for some weeks. A species of fermentation is set up, during which the gallic acid is formed in large quantities by the decomposition of the gallotanic acid or during which the gallio asid is formed in large quantities by the decomposition of the gallotannic acid or tannin contained in the galls. Gallio acid crystallizes in silky needles or brilliant rhomboidal prisms, which dissolve in 100 parts of sold water and three parts of boiling water. It is freely soluble in alcohol, but sparingly so in ether. Gallio acid is tribasic, according to Streeker, and forms three classes of salts, containing one, two, and three equivalents of metal. The gallates of the alkalies speedily absorb oxygen if exposed to the most characteristic reaction of this acid is the formation of a deen phinish black solution, when added to a most one activistic reaction of time and is the forma-tion of a deep bluish-black solution, when added to a mixture of the protosalts and persalts of iron. The gallates give no precipitate with gelatine, in which they are distinguished from the gallotannates. Heated to a temperature of from 410° to 420°, gallic acid sublines, and is whill converted into precognilic and carbonic temperature of from 410° to 420°, gallic acid sublimes, and is wholly converted into pyrogallic and carbonic soids. If the temperature passes 480°, melagallic acid is formed. Callic acid is extensively used as a source of pyrogallic acid, so largely employed in photographs. Gallican Causer, gdl-to-kån (from Lat. Gallia, Gaul), is the name given to the Roman Catholic church in France, which, although in communion with the see at Rome, maintains, in some respects, an independent position. It has, from the earliest times.

the see at Rome, maintains, in some respects, an independent position. It has, from the earliest times, enjoyed certain liberties and immunities, not as grants from the popes, but as forming part of her original constitution, which she has always striven to maintain. When the Church of Rome was grasping after temporal power, their efforts in France were frequently opposed by the sovereigns, and more than one conflict was the consequence. There thus arose two parties in the French church,—those who were opposed to the encroachments of the see of Rome, and were known as the Gallican party, while the supporters of the encroachments of the see of Rome, and were known as the Gallican party, while the supporters of the Boman see were known as the Roman, Papal, or Ultramontane party. The earliest important manifestation of this opposition appears in the pragmatic sanction of Louis IX., issued in 1268, which made the paying of taxes to the pope dependent on the consent of the king and the national clergy, and forbade the interference of a foreign power in the affairs of the national church. The spirit of independence was attemptional church. or me measure character. The spiric of independence was strengthened by the decrees of the councils of Constance and Basel, which were adopted by France at the assembly of estates as Bourges in 1438, and promulgated in the pragmatic sanction of Charles VII.,

the fundamental law of the Gallican church. the uncamental law of the Galliesn church. This placed the general council above the pepe, forbede the psying of taxes to the pope for appointing bishops and prelates, and abolished the annates after the death of the then living pope. This sanction was repealed by Louis XI. in 1461, but restored by Charles VIII., and by Louis XII. through the edict of 1496. It was superseded, however, by the concordat entered into by Francis I. with Leo X., who had promised to confer upon the king greater power in ecclesiastical matters Louis XI. in 1461, but restored by Charles VIII., and by Louis XII. through the edict of 1486. It was superseded, however, by the concordat entered into by Francis I. with Leo X., who had promised to confer upon the king greater power in ecclesisatical matters than he had hitherto enjoyed. This paction gave great disastisfaction both to the French people and the French clergy. In the reign of Louis XIV., a contest arose between that monarch and Pope Innocent XI. regarding the ecclesiastical, rights of the crown, which led to the drawing up of the well-known declaration of the French clergy in 1682, which has since been regarded as the charter of Gallicanism. It was drawn up by Bossuet by order of Leuis XIV., and contained the four following articles:—(1) Kings and princes are in temporal matters subject to no spiritual power, and the latter can never absolve subjects from their oath of obedience; (2) the pope is subject to the decisions of an ecomemical council; (3) the power of the pope is further limited, as far as France is concerned, by the established prescriptions and usages of the Gallican church; and (4) in matters of faith, size, the decisions of the pope are not infallible when not confirmed by the consent of the whole Church. These articles remained valid, and formed the palladium of the Gallican party in the Church that he revolution of 1789, when the Church was formally abolished. Napoleon, as first consul, again established the Church by a concerdat, which he concluded with Pope Pinss VII. in 1801. The following year he added certain articles to the concordat, to the effect that the proclamation of papal decrees depends upon the discretion of the government; that there shall slaways be an opportunity for an appeal to the concided a new concordat with Pins VIII. by which that of 1801 was should by the four propositions of the Bourbon dynasty established the Gallican church in a state of greater dependence upon Rome than it had been before; and in 1817 Louis XVIII. concided a new concordat with Pins party has become almost extinct. As an instance of the spirit that prevails, the Roman liturgy has been introduced into one diocese after another, until it has entirely superseded the old national liturgies. Under Napoleon III., the bishops claim the right to meet without previous authority in provincial councils, and the government, without deciding the legal question, has permitted them to do so, in order to avoid a conflict. Indeed, recent events in that country show that there is nothing the State is more anxious to avoid than a conflict with the Church. The Gallican church has produced some men of distinguished eminence and

### Galliciam

piety; among whom may be mentioned Bossuet, Féndion, and Pascai.—Ref. J. de Maistre, De l'Eglise gallicans; Dupin, Les Labertés de l'Eglise gallicans; and Fraysinous, Les vrais Principes de l'Eglise galli-

GALLIGIER, gdl'-le-sism (Lat., from Gallia, France), in Lit., is applied to any phrase or mode of speech used in our language, but which is modelled after the

French.

Galleracesova Biens, gallis-av-sis-us (Lat. galles, a cock), the name applied to such birds as, in common with the domestic cock, have the upper mandible vaulted, the nostrils pierced in a large membranous space at the base of the beak, and covered by a cartilaginous scale; wings short, flight laborious, and carriage heavy. Birds of this order have an extremely powerful gizzard, and generally a large globular crop; nest artices, and placed on the ground; eggs numerous; food pointed out to their young by the parent. parent.

parent.

Parent.

GALLIOT, gill-le-ot (Fr. galiote), a kind of vessel used on the Mediterranean Sea, which is amaller than a galley, but larger than a felucea. The term is also applied to a strongly-built flat-bottomed vessel used as a bomb-ship. The Dutch, also, have a kind of strong, but heavily- and olumsily-built, merchant-ship, rounded both fore and aft, and of about 200 or 800 tons burthen, which they call by this name.

GALLON, gill-lon (Sp. galon), a measure of capacity, both for dry and liquid articles, which contains exactly four quarts. It is enforced by act of parliament, 5 Geo. IV. c. 74, that "the imperial gallon shall be the standard measure of capacity, and shall contain 10 lbs. avoirdupois weight of distilled water (weighed in air at the temperature of 62° of Fahrenheit's thermometer, the barometer being at 30 inches), or 277-274 cubic inches; and all other measures of capacity to be void. the barometer being at 30 inches), or 277-274 cubic inches; and all other measures of capacity to be void, as well for wine, beer, ale, spirits, and all sorts of liquids, as for dry goods not measured by heaped measure, shall be derived, computed, and ascertained from such gallon; and all measures shall be taken in parts, multiples, or certain proportions of the said imperial standard gallon. The old English gallon, wine measure, contained 231 oubic inches; and the old English gallon all measure, contained 282 oubic inches. As the imperial gallon contains 277-274 oubic inches, it follows that it exceeds the former wine gallon by about one-third; while it is about one-sixtieth less in capacity than the old ale gallon.—Eqf. Macculloch's Commercial Dictionary.

city than the old are gauon.—my. sacronactic cial Dictionary.

Galls, gawls (Sax. gealla, a gall), excrescences produced on the branches and leaves of trees by the attacks of insects. Oak-trees are especially liable to be thus attacked. Galls are extensively employed in tanning, for making ink, and for other purposes in the arts. The different kinds are described under the arts. The differences.

head of Quescus.

Gall-Stones. (See Calculus.)

Galvanies. (See Electricity, Voltaio.)

best quality is prepared by immersing the clear metal in a bath of moltan sine covered with as amall quantity of in by voltaic action, before being dipped into the sine; hence the somewhat absurd name by which it is commercially known. (See Leon, Galvanies.)

Galvanometer, galvan-om'es-ter (from galvanies.)

Galvanometer, a measure), an apparatus or instrument constructed for the purpose of detecting the presence of feeble electro-chemical currents. Instruments of this sort wore first introduced by M. Schweig.

presence of this sort were first introduced by M. Solweig-nents of this sort were first introduced by M. Solweig-ger, a German philosopher. The principle upon which his galvanometer-muliplier was made, depended upon the action which a voltaic current exercises upon a magnetized needle. A conductor traversed by a current placed above a needle, but very near it, and parallel to its axis, makes this needle turn to the east

## Gambling

current is transmitted passes first above and then below the needle, so as to form two parallelpranches between which the needle is suspended, the settion of the current upon the needle will be similar in both cases. The upon the needle will be similar in doin cases. Ine force this produced is twice as much as that produced by a single conductor; if, however, the conductor be bent twice, the effect is four times as great; in short, by causing the conductor, usually made of wire, to make a very great number of convolutions, the action of the current upon the magnetized needle can be multiplied to such an extent that very feeble current; can readily be detected. In constructing an instrument of this kind, the copper wire used is covered with silk, so that the different convolutions may be juxtaposed and superposed without there being any direct metallic communication between them. The galvanometar has been greatly improved by Cumming, Nobili, and Melloni, and has been brought to a remarkable degree of delicacy. Other instruments used for the same purpose are Ritchie's torsion galvanometer, in which the magnetized needle is brought back by torsion to its normal position, and the angular distance passed over measured; since it follows that the intensities of the currents are proportional to the angles of torsion. force thus produced is twice as much as that produced currents are proportional to the augles of torsion.

M. Becquerel's electro-dynamic balance measures the strength of electric currents by means of a sensitive steel balance, which can turn at about a hundredth of a

strength of electric currents by means of a sensitive steel balance, which can turn at about a hundredth of a grain. Galvanometers are sometimes called Rheometers, from the Greek reo, I they; metron, a measure.

Gambie, or Gambier, gâm'-beer (after Gambier), a kind of catechu, prepared from the leaves of the Uncaria, or Nauciea Gambir, a plant of the ord. Cinchonacea, and a native of Malscoa and the Indian Archipelago. It is sometimes called pale terra-japonica, and by druggists catechu in square cakes. It is one of the most powerful of astringents, and is largely employed in tanning and dyeing; also in medicine.

Gambir, gâm'-bit, a word derived from an old Italian phrase, used to signify the tripping up of an adversary in wrestling. It is applied in the game of cheas to the first move, by which the player puts forth a pawn caprise, in order to force his antagonist to take it, and thus allow him, the first player, to bring forward his superior pieces sconer than he could otherwise have done. There are several gambits; but the one which is the most important is what is termed the "king's gambit." It is said by an experienced player of the is the most important is what is termed the "king's gambit." It is said by an experienced player of the intricate game of chess, that the most brilliant and animated of all openings are those performed by means of gambits. They are full of risk, but, to a dashing player, they afford time and opportanity for some of the best combinations on the board. (See Chess.)

Gambling, or Gaming, gam'-bling, gai'-ming (Sax. gamian, to risy at any sport), is a vice which has been common among most nations, civilized and novivilized.

common among most nations, civilized and uncivilized. Tacitus tells us that the ancient Germans were so ad-Tacitus tells us that the ancient Germans were so addicted to it, that, when stripped of everything else, they would stake at last their iberty, and their very lures, the loser going into voluntary slavery, and though much younger and stronger than his antagonist, suffering himself to be bound and sold. In Rome, particularly during the empire, the practice was common, and various enactments were made against it. In England, various enactments were made against it. In England, also, gaming was early made the subject of penal enactments. By 33 Henry VIII. c. 9, "ano person shall, for his gain, lunce, or living, keep any common house, alley, or place of bowling, coyting, cloyth, cayle, half-bowls, tennis, diceing-table, carding, or any unlawful game then or thereafter to be used, on pain of forfeiting 40s. a day;" and every person haunting or using the asid houses was declared to forfeit 6s. 8d. By 9 Anne, c. 14, all bonds and other securities given or using the said houses was declared to forfeit 6s. 8d. By 9 Anne, c. 14, all bonds and other securities given for money won at play were declared to be void, and any person losing £10 at one time or sitting might, within three months, recover the same, with costs, a any court of record; and after three months any other person might sue for and recover the same, and trebbe the value thereof, with costs. Various statutes were subsequently enacted on this subject; and in 1845, Act 8 & 9 Vict. c. 109, was passed, which greatly facilitated proceedings against common gaming-houses. It enacted that, in default of other evidence, it shall be sufficient to prove that a house or place is kety or used parallel to its axis, makes has needle turn to the east subsequently enacted on this subject; and in loss, Acc or west according as it is moving in a direction from north to south or from south to north. If the current is below, it causes the needle to turn to the east when it is moving from south to north, and to the west when it is moving from north to south; it follows, therefore, that when the conductor through which the is not necessary, in order to constitute the house a

#### Gamboge

common gaming-house, to prove that any person found playing attenty game was playing for any money, wager, or stake. Commissioners of police, or justices of the peace, may also authorize superintendents, without the necessity of an allegation by two householders. without the necessity of an allegation by two nonse-holders, to enter any suspected room or house with constables, and, if necessary, to use force for that pur-pose, and to take into custody all persons found therein; and if any cards, dice, balls, counters, tables, or other instruments of gaming, be found in the room or house, or about the person of any of those found therein, it shall be evidence, until the contrary be made therein, it shall be evidence, until the contrary be made to appear, that it was a common gaming-house. This statute also enacts, that cheating at play is to be deemed obtaining money by false pretences, and is to be punished accordingly. It further provides, that all contracts or agreements, whether by parole or in writing, by way of gaming or wagering, shall be null and void; and that no suit shall be brought or maintained in any court of law or equity, for recovering any sum of money or valuable thing alleged to be won upon a wager. By 16 & 17 Vict. c. 119, "betting-houses" are declared to be within this act, and a penalty imposed on persons so betting. The act 18 & 19 Vict. c. 38, enacted penalties and imprisonment against any person attempting to interfere with the against any person attempting to interfere with the constables in the performance of their duty, or obstructing their entrance into any house regarding which there was evidence of its being a common gaming-house. Notwithstanding all these legislative enactments, there still exist within this metropolis not a few of those gaming-houses, and which go by the appropriate name of "hells." In most of the states of Germany gaming is allowed, and the sovereigns of several of them derive a large revenue from letting the exclusive privilege of keeping such establishments, as at some of the more fashionable watering-places. In at some or the more fashionable watering-places. In France, prior to 1858, when the practice was abolished, the exclusive right of keeping public gaming-houses was let out to a company, who paid the government six millions of francs annually for the privilege. Much valuable information on this subject was obtained by the select committees of the House of Commons on

valuable information on this subject was obtained by
the select committees of the House of Commons on
gaming, in 1844. (For further information see also the
English Cyclopadia, section Arts and Sciences.)
GAMBGE. (See CAMBGE, GARCINIA.)
GAMB LAWS are a remnant of the ancient forest
laws, by which all game was regarded as the property
of the king, and no person had any right to kill such
animals unless authorized by royal grant of a chase or
free warren. Afterwards, a right to kill game was conceded to such as possessed a sufficient qualification; as,
(1) the having a freehold estate of £160 per annum;
(2) a leasehold for ninety-nine years of £150 per annum;
(3) being the son and heir-apparent of an esquire or
person of superior degree; (4) being the owner or keeper
of a forest, park, chase, or warren. For unqualified
persons transgressing these laws by killing game,
keeping engines for that purpose, or even having game
in their custody, various penalties were assigned. At
length, after much discussion in and out of parliament,
nct 1 & 2 Will. IV. c. 32, was passed, by which the
necessity of any qualification for the killing of game
was abolished, and the right was made to depend simply
on the taking out of a game certificate, for which a
certain annual sum was payable. In terms of this act,
every certified person may kill game, subject to the
law of trespass. Game is declared to include hares,
pheasents, partridges, grouse, heath-game, moor-game,
plack-game, and bustarde: but woodcooks. mites. naw or trespess. Game a declared to include large, pheasants, partridges, grouse, heath-game, moor-game, black-game, and bustards; but woodcooks, snipes, quails, landrails, and conies, though not game, are slap protected, certificates being required to kill them.

#### Game Laws

conviction. When any person shall be found upon any land in the daytime in search of pursuit of any game, it shall be lawful for any person having the right of killing game, or the occupier of such land, or any person authorized by them, or either of them, to require such person forthwith to quit the land, and also to tell his name, surname, and place of shode; or, if he refuse to do so, or remain upon the land, he may be apprehended and brought before a justice of the peace, and shall be liable, upon conviction, to pay a sum of money not exceeding £5, with expenses; but the person so apprehended cannot, on any pretence whatever, be detained longer than twelve hours until he be brought before some justice of the peace. If any unsuthorized person be found, either by day or night, upon any land in search or pursuit of game, and shall then have in his possession any game which appears to have been recently killed, any person having the right to kill game upon such land, or the occupier of such land, or any person or persons authorized by them, may or any person or persons authorized by them, may demand such game, and seize it if not immediately given up. The destruction or taking away of the eggs of any bird of game, swan, wild duck, teal, or widgeon, renders the person liable to a penalty not exceeding 5s. for each egg so destroyed or taken away. The law is still more severe against any persone taking or destroying game by night. By 9 Geo. IV. c. 69, it is declared, that if any person, by night, shall take or kill game or rabbits on any land, or shall enter thereon with gun, net, ngine, or other instrument for the purpose, he shall, upon conviction before two justices, be committed to hard labour in the house of correction for a term not exceeding three months; and at the given up. The destruction or taking away of the eggs committed to hard insour in the house of containing for a term not exceeding three months; and at the expiration of that period find securities for twelve months, himself in £10, and one or two others in a like sum; in default of which, a further term of imprisonments. expiration of that period find securities for twelve months, himself in £10, and one or two others in a like sum; in default of which, a further term of imprisonment of six months. Offenders under this act may be apprehended on the spot by owners or occupiers of lands, their servants or assistants; and if they assanlt or offer violence with gun, olub, stick, or otherwise, they are liable to be transported for seven years (now penal servitude), or to be imprisoned, with hard labour, for two years. The punishment is still more severe where three or more persons enter any land for the purpose of taking or destroying any game. By 8 & 9 Viot. c. 29, the provisions of this act were extended to persons taking or killing game upon the public roads of highways, and other roads and paths leading to inclosed gates, &c. it is unlawful for any person whatsoever (licensed or unlicensed) to kill or take any game, or to use any dog, gun, net, or other engine or instrument for killing or taking any game, on a Sunday or Christmas-day, under a penalty of £5; it is also unlawful for any person to kill or take any participe between the 1st February and 1st September in any year, or any pheasant between the 1st February and 1st October in any year; or any black-game between 10th December and 20th August in the succeeding year (except is Somerset, Devon, or New Forest, Southamptonshire, to 1st September); or any ground, whether open or inclosed, or in any highway, with intent to destroy or nijure any game, shall be liable to a penalty of £1 for each head of game so taken or killed. To put any poison, or poisonous ingredient, on any ground, whether open or inclosed, or in any highway, with intent to destroy or nijure any game, shall be liable to a penalty of £10. Act 25 & 28 Viot. c. 114 (1862), authorizes any constable or peace officer of any county, borough, &c., in Great Britain or Ireland, to search in any highway, street, or public place, any person whom he may have good cause to suspect of having been unlawfully in search or pur 

is payable annually to government. An annual game-license costs £3, but one for about half a year may be had for about £2. A gamekeeper's license costs £2. By 11 £ 12 Vict. c. 28, an owner or compiler may, how-ever, kill harse or rabbits on his own inclosed ground, ever, and maries another to do so, without any game-lisanse. Such are the principal legal enactments in force on this subject at present. The game laws have long been a subject of discontent, and few unprejudiced persons can view them without coming to the conclusion that they are unreasonably oppressive and severe They are a remnant of the ancient feudal system, and Biackstone says, in speaking of the ancient forest laws, "from this root has sprung a bastard slip, known by the same of the game law, now arrived to, and wantoning in, its highest vigour, both founded upon the same unreasonable notion of permanent property in wild creatures, and both productive of the same tyranay to the commons; but with this difference, that the forest laws established only one mighty hunter throughout the land, the game laws har raised a little Minrod in every manor." The game laws are isdeed an attempt fourcestre, in the midst of oultivation and civi-They are a remnant of the ancient feudal system, and axempod in every manor. The game naws are naced an attempt to preserve, in the midst of oultivation and civilisation, the pursuits and amusements of an earlier and a ruder age. They are among the greatest hindrances to the improvement of agriculture, not only in many cases interfering with the operations of the cultivator, but, where plentiful, also causing a serious loss in the actual products. It is said that from three to five hares eat and destroy as much as would keep one sheep. The game is fattened at the tenant's expense, and the land-lord derives all the advantage from them. Many landlords take means to preserve game which none but tenants in a wretched state of dependence would submit to. Further, it has been said that "there is perhaps no single cause more injurious to the morals of the rural populations than the game laws." They constitute that an offence which neither conscience nor common sense can regard to be one; for the peasant does not naturally see any more right of property in a partridge than in a sparrow, nor can he understand that right of property which only continues anderstand has right of property which only continues so long as the animal remains upon a person's land. It is an unfortunate peculiarity of these laws, as protecting not property but a privilege, that they caunot be enforced without arming man against man, and producing conflict and bloodshed. The evidence of the crime is the capture of the committer of it in the act; and hence has arisen an armed game-police, acting not under a public responsible authority, but commanded in each instance by their private employers and owners of the soil. Offences, too, against the game laws are decided upon and punished by a class whose prejudices, if not their interests, favour a stringent application of the provisions of the code. The offender, too, be brought to associate in prison with theirers and housebreakers; and even though he may not have been directly contaminated by them, he not have been directly contaminated by them, he cannot be expected to have the same horror for the baser crimes as he had before. It has indeed been said that the sports of the field are favourable to health, strength, and high spirit. This may have been true of the old system, but it can scarcely, we should think, be said of the modern system of battue shooting,—the woods and plantations being beaten by men and boys, the game driven within gunshot, and attendants loading the sportsmen's guns, so that many hundred heads of game are slaughtered in a few hours.—Hef. English Cyclopadia—Arts and Sciences; Encyclopadia Distances; Paterson's Game Laws of the United Kingdom.

GAMES. gains (Sax. games. diversion. sport. pas-

Games, gaims (Sax. gaman, diversion, sport, passime), a term applied to certain bodily exercises and meantal vectorations practised as a relaxation from business or study, or employed as a mode of passing the time. They are divided naturally into two classes, mental and physical, but more definitely they are distinguished as games of chance, games of skill, and mixed games. In the first class the result does not depend upon the attention and deterrity of the player, but is merely determined by chance; it includes games played with dice alone, such as hazard, and many of the games played with cards, such as quinze, vingt-etm, languenet, commerce, loo, &c. The second class semprehends those games which, when once begun,

are independent of chance, and are gained by the superior skill and experience of out party. In many games of this kind, however, where the skill of the parties is equal, he who plays first is most frequently the winner. There are very few mental games of this class; but chess and draughts hold the highest places. It includes several interesting and popular physical games; among others, cricket, curling, bowling, golf, tennis, billiards, &c. In the third class the games are generally decided by chance where the players are generally decided by chance where the most important of these are whist, cribbage, piquet, casino, all-fours, and backgammon. Some games are very ancient, and dice were very early used by the ancient Greeks and Romans. Among the latter a game was played closely resembling the modern hazard. They had to work and so dice—the tesser and the tall; the former were exactly similar to modern dice, marked with Roman numerals on the sir sides; the latter were oblong pieces of bone marked on four sides only. The game of chess is also very ancient, and is supposed to have had its origin in the East. (See Craxes.) The several games at cards are modern in their origin; they are said by some to have been invented about the close of the latte entury for the musement of the French monarch Charles VI., while others place the French monarch Charles VI., while others

spectacles of varied kinds celebrated by the ancients, which, in the earlier ages, were connected with religious ceremonials. The public games of the Greeks were very numerous, and the origin of many of them is lost, on account of the religious mystery in which they were founded. Among the Grecian games, the most celebrased were the Olympic, the Pythian, the Nemean, and the Isthmian. The conquerors in the Olympic games were held in high respect, and were looked apon as the noblest and happiest of men. These games were held every five years at Olympia, in Elis, on the west side of the Poloponnesus. Among the exercises, some were designed to give strength, and others agility. The lighter exercises comprised runing, leaping, throwing the quoit, and hurling the javelin. The more severe course of discipline included wrestling and boxing. Racing also constituted a particular feature in all the ancient games. The Isthmian games were held at Corinth, and, together with athletic exercises, horse and chariot races, constituted a large portion of the spectacle. Originally these games were connected with the worship of Neptune, the wide diffusion of which gained for them the great celebrity which they long enjoyed. The Persian war gave an impulse to the Isthmian games, while the Peloponnesian war dimmed their glory. Under the Romans, these cames did not lose their importance, but were exhibited with increased calebrity. They were then held every three years, and comprised three leading divisions,—musical, gymnastic, and equestrian contests. The prize at the Olympic games was merely a chaplet of wild olive. These chaplets, together with branches of palm, which were carried in the hands of the victors, were placed on a tripod in the middle of the course, so as to be seen by all the spectators. At the Isthmian games, the prize was partier during the mythic periods; in later times, however, the victor was generally crowned with a wreath of pine-leaves, although parsley was also often employed. The amusements in the Roman circu

terially from those which were selebrated in the games of ancient Greece.\* The thericonachia, or beast-fight, was a favourite species of entertainment among them; and the men employed in this barbarous amusement, in which men fought with wild beasts, were called bestiarii. The combatants were divided into two classes,—those who fought voluntarily for amusement or pay, and who were provided with weapons,—and condemned persons, who were generally exposed to the fary of the animals naked, without arms, and sometimes bound. The Romans were passionately fond of these beast-fights, and very large numbers of animals were emgaged in them. Under Pompey, no less than 600 lions were thus destroyed; and under Titus, 6,000 wild and 4,000 tame animals perished us a similar manner. There is no doubt that, although these latter exhibitions produced a debasing effect upon the minds of the beholders, the athletic games of the ancients not only improved the physical development of the people, but tended directly to advance their intellectual and moral oulture. The early and long training by which they were preceded, and the long training by which they were preceded, and the exercises through which the child, the youth, and the man were conducted by successive stages, ultimated at length in that union of beauty and strength in which physical perfection consists, and in which the ancient Greeks surpassed every other known nation.

ancient Greeks surpassed every other known nation.

Gaming. (See Gamille).

Gaming. (See Gamille).

Gaming. Gaming. A term applied to the table or scale invented by Guido d'Arrezzo, from his having adopted the gumma, or third letter of the Greek alphabet, as a sign for its lowest note, which was one note below the proslambanomenos, or lowest tone of the ancients. It consisted of twenty notes, viz., two octaves and a major sixth. In modern music, the term gamat signifies the distortion scale and is occasionally applied to the the diatonic scale, and is occasionally applied to the note G below the bass clef.

GARGLION, gång'-le-on (Gr.), in Anat., is a small rounded or elongated nervous mass, of a reddish-grey colour, situated in the course of the nerves. They are of two kinds, one forming part of the cranial system of nerves, and situated near the origins of many of the cranial and all of the vertebral nerves; the other forming part of the sympathetic system, extending in a series along each side of the vertebral column, and occurring numerously in other parts. They differ series along each side of the vertebral column, and occurring numerously in other parts. They differ widely from each other in figure\_saud size, some of them being large and conspicuous, while others may be almost termed microscopic. They are composed of two substances, one white, like the medullary matter of the brain, the other reddish-grey, somewhat resembling the cerebral cortical substance. The internal medullary filaments are the continuation of the nerve upon which the ganglion is situated; they are invested externally by a thin but firm and closely-adherent envelope, continuous with the sheath of the nerves, and composed of dense arcolar tissue. This outward covering sends processes inwards through the interior mass, ing sends processes inwards through the interior mass ang sense processes investe through a the interior mass, dividing it, as it were, into lobules, and supporting the numerous fine vessels which pervade it. A section through a ganglion in the direction of the nervous cords connected with it discloses to the naked eye merely a collection of reddish-grey matter, traversed

cords connected with it discusses to the mater cyc
meresy a collection of reddish grey matter, traversed
by the white fibres of the nerves.
Ganglion, in Surg., is a small indolent fluctuating
tumour, developed in the course of the tendons,
and containing a semi-fluid secretion inclosed in a
cyst, generally communicating with the tendonous
sheath. They sometimes form without any apparent
cause, but generally they arise from some wrench or
tension of the tendon. They are most frequently
globular; but when much enlarged, it is rendered irregular by the pressure of the tendons. The treatment
consists in rupturing the cyst, and allowing the contained fluid to be extravasated into the cellular tissue,
where it is speedily absorbed, whilst the cyst inflames
and becomes obliterated. A common mode of rupturing them is either by firm compression with the
thumb, or by striking the swelling sharply with some
obtuse body, as the back of a book, the part being
subsequently bandaged, and rest enjoined for a few
days.

GANGREET, gang'-green (Gr., From grao, I feed upon), in Med., is a term applied to the first stage of morti-

fication, so called from its enting way the flesh. It is divided into two kinds, the moist and the dry; the former, called also inflammatory or acute gangrees, is that which is preceded by inflammation; while the latter, called also chronic or idiopathic gangrees, is that which takes place without any visible inflammatory action having preceded it. The most frequent causes of gangrees are violent inflammation, cryspelss, causes of gangrene are violent inflammation, crysic contusions, burns, cold, deficient circulation of the blood or nervous energy. When it results from high and active inflammation, there is at first severe pain and acover innammation, there is at first severe pain in the part attacked, and generally n considerable degree of swelling. After a time, however, the part, from being painful, loses all sensibility and becomes cold, the reduces disappearing, and being replaced by an irregular dark colour of the skin, in some parts cold, the reduces disappearing, and being replaced by an irregular dark colour of the skin, in some parts approaching to black, while in others it is of a dark brown or greenish hue. If there is a running sore, the discharge from it will cease; the cuticle is raised by vesications, from which, on breaking, there issues a bloody serum. The constitution sympathises with these local changes; the inflammatory fever of the tense to an enarges; the innammatory rever of the earlier period disappears, and is succeeded by great languor and debility; the pulse is weak, quick, irregular, and sometimes intermittent; the stomach is deranged, delirium frequently occurs, and hiocough is one of the most characteristic signs of the disease in its more advanced stage; the countenance also indicates the existence of great local and constitutional derangement, the features are collapsed and the eyes sunk. When the gangrone is not the result of high and active inflammation, the inflammatory or febrile symp-toms are slight or altogether wanting; but there is the same discoloration of the skin, vesication, discharge of bloody serum, and morbific appearance. In the trestsame disconvention of the skin, vestication, discharge of bloody serum, and morbific appearance. In the trestment of this disease, during the active inflammatory stage, local bleeding with leeches, and also bleeding from the sam, if the strength of the patient warrant it; but care has to be taken to reduce the general tone of but care has to be taken to reduce the general tone of the system as little as possible. Soothing fomentations and warm poultices should be applied to the part; and, as internal remedies, bark, wine, and opium will be found most beneficial. When the gangrena cannot be stopped in its first stages, then the separation of the mortified parts is to be expedited, which is best done by yeast or port-wine poultices, supporting the constitution at the same time. When this cannot be done, the removal of the limb, if practicable and not contra-indicated by a too-wakened state of the body, is the only chance of saving the patient's life. Gangrene resulting from severe cold is remarkable for the little pain generally preceding, the part having frequently resulting from severe cold is remarkable for the little pain generally preceding, the part having frequently periahed without the patient being aware of the circumstance. A part suffering from a severe degree of cold should first be rubbed with snow or a coarse towel, in order to restore the suspended circulation, avoiding at first any artificial heat, which might be the means of inducing inflammation. Gangrene may also arise from a diseased state of the blood-vessels, attended with debility of the constitution, a form of the disease commonly known as gangrena senitis. It rarely occurs except in advanced life, and neually attacks the lower extremities, proceeding from the toos nowards. occurs except in advanced life, and usually attacks the lower extremities, proceeding from the toes upwards. Its progress is sometimes slow and sometimes rapid; in some cases it is attended with little or no pain, in others it is very painful. As the parts mortily, they become dry and hard. The constitution should be strengthened by the free use of bark, opium, and port wine, and the part should be covered with lint moistened with campaignated spirits of wine, and the limb wrapped in cotion. Hospital gangrene, or phagelena gangreness, is a form of this disease which attacks open wounds or ulcers, and is so called from its appearing most frequently in crowded hospitals, and sausing a fearful mortality among the patients. Its symptoms and treatment are similar to those already mentioned. already mentioned.

already mentioned.

Gangway, gdng'-way (Ang.-Sax.), a term used in Mar. to denote a peasage or thoroughfare of any kind. In deep-waisted ships, it designates a narrow way built horizontallyshing the upper part of a ship's side from the quarter-deck to the forecastic.

Gangur, gang (derived from Ger. gang, a channel or vein), the mutrix or veinstone of ores. These are always included in some stony matter which forms the

principal portions of the veins or beds which are worked for the sake of their metalliferous contents. worses for the most common veinstone, and has been called the mother of ores. Calearons spar is also a frequent predominant material of veins. Sulphate of barytes, or heavy spar, and fluor spar, are also found as gangues. found as gangues.

GANNET, Or SOLAN GOOSE, gan'-net (Sax. ganot).— In the north of Scotland, the Hebrides, and in Nor-In the north of Scotland, the Hebrides, and in Norway, this bird is very abundant. It is almost the size of the tame goose. The bill is about six inches long, jagged at the sides, and straight nearly to the point, where it inclines downwards. A loose skin, bare, and capable of considerable distension, hung from the blade of the lower bill, and extended over the throat, serves as a pouch in which to convey food to its young. The neck of the gannet is long; body flat, and very full of feathers. The crown of the head and a small space of the hind part of the neck are helf-colour, and full of feathers. The crown of the head and a small space on the hind part of the neck are buff-colour, and, with the exception of the quill and the bastard wing-feathers, the remainder of the plumage is white. The legs and toes are black, but the forepart of-each is marked with so bright green stripe. The male and female are nearly alike. The young are at first covered with very beautiful snow-white down; at the age of about six weeks, the feathers make their appearance, and at the end of three months they are ready to fly. The food of the gannet consists of salt-water fish, the herring and pilchard being the staple. It takes its prey by darting down on it from a considerable height. It makes its nests, which are composed chiefly of turf and sea-weeds, in the caverne and fissures of rocks or on their ledges, as well as on composed chiefly of turf and sea-weeds, in the carerns and fissures of rocks or on their ledges, as well as on the plain surface of the ground. The female lays three white eggs, somewhat smaller than those of the goose. It is stated, however, that the three eggs are only laid in the event of the first and second being removed; and that if left to its own devices, the bird will lay but one egg. These birds are found in great abundance on the island of Kilds, a little spot standing remotely westward in the Atlantic Oceau. The annual "yield of hirds is computed at from ventry to effect thousand of birds is computed at from twenty to fifty thousand, while the egg crop is almost incalculable. The most favourite resort for these sea-fowl, according to the late Bishop Stanley, is a tremendous precipice about thir-teen hundred feet high, formed by the abrupt termination of Conadean, the most elevated hill in the island of Britain. The great dependence of the egg-takess are ropes of two sorts,—one made of strips of hide, the other of the hair of cows' tails, all of the same thickness. These ropes vary in length from fifty to two hundred feet, and sre three inches in circumference. So valuable are these ropes, that a St. Kilda swain marrying a damsel whose dower is a good long cowtail-hair rope, considers that he has made rather a splendid match. The scientific name of this bird is Sula Bassana.

GAOL, or JAIL, jail (Fr. geol; Sp. jaula, a cage) (See PRISON.)

GAOL DELIVERY is a commission directed to the justices of assize, &c. of each circuit, empowering them to try and deliver every prisoner who may be in gaol when they arrive at the circuit town, whenever gaoi when they arrive at the circuit town, whenever or before whomsoever indicted, or for whatever crime committed. In this respect their authority differs from that of justices of oyer and terminer, who can proceed only upon indictment found before themselves. Gables, gar-bi (Fr. garber, to make clean), in Law, signifies to separate or sever the good from the bad,

the sufficient from the insufficient. Hence in London the garbler of spices was anciently one empowered to enter into any shop, warehouse, &c. to view and search drugs and spices, and make clean the same, or see that it be done.

That it De Gone.

GARCINIA, gar-sin'-e-d (in honour of Dr. Garcin, an oriental traveller), in Bot., a gen. of the nat. ord. Guttifera. The species G. manyostana, a native of Malacca, produces the mangosteen, which is reputed to be the most delinious of all fruits. This plant has recently been brought to bear fruit in stoves by British hortinulturists.

an application to chapped hands, and has been recently imported into this counts. One or more species of this genus are supposed to yield our commercial and official gamboge, which is brought from Siam in cylinders, either solid or hollow, and in large cakes or amorphous masses. The pipe, or roll gamboge, is the finest kind. In medicine, gamboge is used as an active hydragogue and drastic purgative. In over-doses it acts as an acrid poison. In the arts it is much employed as a water-colour, and to give a golden tint to lacquer-varnish for brass-work.

Gandenia, gar-de-ne-d. in Bot., a gen. of the nat. ord. Cinchonacea. From the fruits of G. grandifora, florida, and radicans, beautiful yellow dyes are prepared, which are extensively used in China and Japan. The genus was named after Dr. Garden, of Charleston, South Carolina, who corresponded with Linneus.

GARDENING, gar'-den-ing (Fr. jardin, a garden), the act of laying out and cultivating pieces of ground, generally of limited extent, and inclosed for the purpose of rearing vegetables, fruits, and flowers. As an of rearing vegetables, fruits, and flowers. As an art of design and taste, gardening is of very ancient date, and with the exception of certain modern improvements, such as glass-houses, &c., was in a high state of perfection two thousand years ago. The earliest gardens of which there is any account are those of Solomon, which are described as having been of quadrangular form, surrounded by high walls. They contained aviaries, wells, and streams of water. The gardens of Cyrus and other Persian monarchs were of creat extent and generally laid out in romantic situation. gardens of Cyrus and other Persian monarchs were of great extent, and generally laid out in romantic situations. They were also distinguished for the great diversity of their uses and products. The first allusion to terraces in gardens is to be found in the description of the celebrated hanging gardens of Babylon. Although Herodotus and others do not mention it in their descriptions, there is little doubt that these terraces were decorated with vases, parapets, &c. Most of the elements of a modern architectural garden are alluded to in connection with those of Babylon. The terraces are described as being furnished with groves, containing fountains, seats, parterres, and banqueting-rooms, and as combining the minute beauties of flowers and foliage with masses of light and shade and existantive prospects. The grove of beauties of flowers and foliage with masses of light and shade and expansive prospects. The grove of Orontes, described by Strabo, must be regarded as a park or large garden in the picturesque style: it was nine miles in circumference. In ancient Greece gardening was rather a neglected art at first, but in process of time great advance was made. The vale of Tempé, the Academus at Athens, and other public gardens, were extremely elegant, and were ornamented with temples alters towns gaters monuments and with temples, altars, tombs, statues, monuments, and towers. On account of the nature of the climate, the towers. On account of the nature of the climate, the chief qualities required in a garden were shade, concess, fresh breezes, fragrance, and repose. The Greeks copied their gardening from the Persians, and the Romans, in their turn, copied that of the Greeks. Little is known of the early style of Roman gardening: the vast edifices projecting into the sea, and the immense artificial elevations, are apparently ridiculed by Cicero and Varro. About this time, however, the cultivation of odoriferous trees and plants began to be attended to; and the planting of trees adjoining each other, whose odours assimilated, was then as much a study with the gardener as the harmonious blending of colours at the present day. The early French and a suny with the gardener as the harmonious blending of colours at the present day. The early French and Dutch styles of gardening were evidently adopted from the description of Pliny's garden. On this subject Loudon remarks:—"The terraces adjoining the house, the lawn declining from themes, the little flower, and any with the fountain in the centre the walks had and so the iswn declining from theence, the fitte howers garden with the fountain in the centre, the walks bordered with box, and the trees sheared into whimsical artificial forms; together with the fountains, alcoves, and summer-houses, form a resemblance too striking to bear dispute." The use of glass in the construction to be the most delicious of all fruits. This plant has creently been brought to bear fruit in stoves by British the construction and the fruit in stoves by British the construction in horticulturists. G. cornea, Kydiana, and pedan-culata yield fruits of a similar character, but much inferior. The seeds of G. purpura, upon being rare trees from India and China, the myrtle and boiled in water, yield a concrete oil called kokum crocus in flower, and the cinnamon and frankincense butter, or oil of mangosteen. It is very useful as trees covered with leaves. Cucumbers were also

#### Garfish

grown there all the year round. The use of hot water in forcing vegatalies was also employed at the same time. Gardening, like all the other arts, languished during the dark ages; but with the revival of learning, the invention of printing, and the Reformation, it began again to flourish. The art was revived and patronised by the family of the Medici in Italy; and their gardens, which were of the geometric and architectural style, long served as models for most of Kurope. It continued to be imitated in France, Germany, and Britain, until the introduction of the English or natural style. In garden architecture very little progress, as far as hothouses are concerned, has been made in the south of Europe, the warmth of the climate rendering them all but useless. There are, however, plant-houses in many places in Spain and Portugal. The French and Dutch styles of gardening resemble each other closely: symmetry and profuse ornament are the characteristics of both. The Dutch style is eminently adapted to the nature of the country, where there are no inequalities of surface as in England. The French style seems to have arisen about the middle of the 17th century, during the reign of Lonis XIV. The most celebrated cardens of the in England. The French style seems to have arrived about the middle of the 17th century, during the reign of Louis XIV. The most celebrated gardener of the period was Le Notre, who laid out the famous gardens of Versailles. Le Notre's style spread rapidly into other countries, and was extensively adopted in this country. The first erection of hothouses in France of the reign of Louis XIV. of versalies. Le Noire sayle spread aspuny aucher countries, and was extensively adopted in this country. The first erection of hothouses in France cocurred towards the end of the reign of Louis XIV., by M. Fagon, in the Jardin des Plantes. The first magnificent attempt at hothouse-brilding was that of Francis I. of Austria, in 1753. They were in five ranges, extending altogether to the length of 1,290 feet, many of them being 30 feet high. Landscape gardening, and the sdoption of the English style, rapidly spread into France, Germany, and Russia, after the year 1762. In the latter country there are several magnificent conservatories, only surpassed by those of Kew, Chatsworth, and the Regent's Park, in this country. The first examples of the English, or natural style of gardening, were those of Pope at Twickenham, and of Addison at Bilton, near Rugby. But these were on a small scale. The higher examples were those of Stowe, Pain's Hill, Claremont, Esher, Hagley, and Woburn Farm, near Weybridge. The earliest hothouses for the cultivation of fruits seem to have been those of the duke of Rutland, erected at have been those of the duke of Rutland, erected at cave been those of the duke of Rutland, erected at Belvoir, in 1705. In modern times, the best-constructed, or most improved, kitchen and foreing gardens, are those of her Majesty at Frogmore. The Royal Botanic Gardens at Kew are unequalled in Europe, while those of Chatsworth, Eaton Hall, and Trentham, are models of taste and judgment. The art of cultivating flowers and fruits in gardening will be found more particularly described under the article HORHTCHYDEN. HORTICULTURE.

HORTCULTUER.

GABFISH, gar'-fish (Esox Belone, Linn.), a fish of the Pike fam., common on the English, Irish, and Scotch coasts. It is about two feet in length, body tapering towards the tail, and of small circumference; beak-like enout; teeth minute and numerous; tail considerably forked. It possesses many names besides that here applied to it, and among the rest, "mackerel guide," because of its supposed habit of preceding the shoals of mackerel in their annual visits to shallow waters for the nurroes of snawning.

or macrered in their annual visits to snahow waters for the purpose of spawning.

GARGLE (Lat. gargarisma, from Gr. gargarizo, I wash the throat), in Med., is a lotion or wash for the throat. It is used by taking a mouthful of the liquid, and then throwing back the head, by which it is passed into the throat, where, by expelling air from the lungs, it is agitated and made to wash all parts of the inner surface. Gargles are extremely useful in various diseases of the throat, and differ in their composition according to the nursues which they are intended to serve. of the throat, and differ in their composition according to the purpose which they are intended to serve. In order to allay inflammation or reduce swelling, warm water with a little vinegar is the best that can be used. When a stimulating effect is required, a mixture of capsicum; to promote suppuration, barley-water and inclusion of linseed used warm; and, as a pure astringent, a decotion of Peruvian bark, with alum or borax, will be found useful.

Gargoyle. or Gurgoyle. now. and [Fe required]

GARGOYLE, or GURGOYLE, gar'-goyl (Fr. gargouille), in Arch., the name given to an ornamental spout pro-

### Garrison

jecting below the battlements of a tower or the para-pet of a well, through which the rain that falls on the roof is discharged at a little distance beyond the face of the wall. The gargoyle forms a striking feature in the Early English and Decorated Rugish styles; being the Early English and Decorated English styles, being frequently in the form of a dragon, or lion, or some heraldic monster, and sometimes a grotesque representation of the human face and figure. It was introduced to mask the unsightly appearance of a piece of leaden pipe sticking out of the wall, the pipe being passed through a block of stone, which was subsequently carved into a form corresponding to the general character of the architecture of the building.

Garner, gar-net (Fr. grenat), in Min., one of the precious stones or gems. It is found in rhombic dodecahedra, and consists chemically of the double silicate of lime and alumina, coloured by iron and manganese. When cut en cabochon, garnets are known as carbuncles (from carbunculus, a little coal). The pryrope is a species of garnet found in Bohemia, coloured with seaquicitied of chromium.

Garnement, gar-nich-ment (Nor. garnisker, to earl) is a warning or notice given to a marky not to nearly

Girmsemmer, gor nich-ment (Nor. garnisher, to warn), is a warning or notice given to a party not to pay money, &c., to a defendant, but, to appear and answer to a plaintiff-oreditor's suit. By the Common Law Procedure Act of 1854, it is declared lawful for any creditor who has detained. who has obtained a judgment in any of the superior courts, to apply to the court, or a judge, for a rule or order that the judgment-debtor should be orally examined as to any and what debts are owing to him, before a master of the court, or such other person as the court or judge shall appoint; and the court or judge may make such rule or order for the examination the court or judge shall appoint; and the court or judge may make such rule or order for the examination of such judgment-debtor, and for the production of any books or documents. And it is lawful for a judge, upon the ex-parts application of such judgment-creditor, and upon affidavit by him, or his attorney, that judgment has been and is still unsatisfied, and that a third person is indebted to the judgment-debtor, and is within the jurisdiction, to order that all debts owing or accruing from such third person (called the garnishee) to the judgment-debtor, shall be attached to answer the judgment-debt, and the garnishee may also be ordered to appear before the judge, or master of the court, and to show cause why he should not pay the judgment-debt. If the garnishee does not forth-with pay into court said sum, and does not dispute the debt, the judge may order execution to issue without any previous writ or process; or, if the garnishee disputes his liability, the judge may, instead of ordering an execution, grant liberty to the judgment-creditor to proceed against him by writ, calling upon him to show cause why execution should not proceed against him for said debt. Payment made by, or execution levied upon the garnishee, under any such proceeding, shall be a valid discharge to him for such amount, as against the judgment-debtor, although the proceeding may be set saide or the judgment reversed.—Ref. Wharton's Law Lexicon.

Garatte, or Garatter, garatte, (Sp. garrote, a stick or Law Lexicon.

Law Lexicon.
GAROTTE, or GARROTE, ga-rot' (Sp. garrote, a stick or cudgel), is the name given to a kind of capital punishment employed in Spain. The criminal is seated on a stool, with his back to a stake, and formerly death was inflicted by means of a rope passed round his neck and tightened behind with a stick (garrote); but now an iron collar is commonly employed, tightened by a screw. The term has recently been adopted in this country, and applied to a mode of robbery, in which one ruffian from behind grasps tightly the victim's throat, so as to prevent him from crying out or making any resistance, while another rifles his pookets. An account of the mode of procedure in such cases will be found in the Cornhill Magazine for January, 1863.
GARRISON, gär-re-son (Fr. garnison, from the low

Cornhill Magazine for January, 1863.
GARRISON, gür'-re-son (Fr. garnison, from the low
Lat. garnison, ammunition, military stores), a term
applied to a body of troops stationed in any town or
fortified place, either to defend the position against an
enemy, to keep the inhabitants under subjection, or
merely to be subsisted. By military writers, the term
garrison is generally applied to a forto refortress, to
the body of troops or guard placed in a citadel, or to
any troop of soldiers quartered in a town.

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GARRYAGRE, gon-re-av-se-e (after N. Gerry, of the Hudson's Bay Company), in Bot., the Garrya fam., a small nat. ord., of Dicotyledones, sub-class Mono-alkamydes. There are but two genera, which include six species, all shrubs found in the temperate parts of North America, or in the West Indies. Nothing is known of their properties.

known of their properties.
GARTER, ORDER OF THE, gar-ter (Fr. jarretière),
one of the most celebrated and ancient of all military
orders of knighthood in Europe, was instituted by
Edward III. The origin of this decoration is ascribed
to a trifting incident which occurred at a ball at which
the king and the countess of Salisbury were present.
The countess is said to have dropped her garter whilst
daming. the kine misking it up, and, observing some danning; the king picking is up, and, observing some of the courtiers to be smiling, restored it to the countess, with the remerk, Hons soit qui mal y pease, "Evil be to him who evil thinks;" and he shortly afterwards is said to have instituted the order of the Garter wards is said to have instituted the order of the traffer with the above motto, as an incentive to chivalry amongst his knights. Another account states that it dates its origin from the reign of Richard Cœur de Laon, who, during his battles in the Holy Band, ordered his knights to wear a white garter above their tenee, to distinguish them from their Saracen foes; and that Richard, on his return to England, instituted the order, in commemoration of that circumstance. Still, according to Ashmole, the date of the order is 1411; and, as the first of its statutes is dated 1450, this 1311; and, as the first of its statutes is casted 1400, thus seems tolerably securate; whence it follows that it was established in the reign of Edward III. Upon the original constitution of the order, it consisted of the sovereign and twenty-five heights companions. The only alteration which has taken place in this respect, only alteration which has taken place in this respect, was caused by the statute passed on the 17th January, 1805, whereby it was decreed that the order should consist, thenceforth, of the sovereign and twenty-five knights companions, together with such lineal descendants of George II. as may be elected, always excepting the prince of Wales, who is a constituent part of the original establishment. Special statutes have likewise been, from time to time, passed for the admission of foreign sovereigns and extra knights; but these are always admitted into the twenty-five companions as soon as yacancies occur. passed for the admission of foreign sovereigns and extra knights; but these are always admitted into the twenty-five companions as soon as vacancies occur. The Military Knights of Windsor are also considered as adjunct to the order of the Garter. The officers of theorder are, firstly, the Prelate, which dignity was first filled by William de Edyngton, bishop of Winchester for the time being; the office enabling him to take his seat in parliament next to the bishop of Durham. The next officer is the Chancellor, who, until the year 1337, was the bishop of Salisbury; but since the see of Oxford has included Berksbire (and consequently the town of Windsor), the chancellor is always the bishop of Oxford. The Registrar, who is dean of Windsor, is the next official; and after these we have the Garter Kingst-Arms (which see), and the Usher of the Black Red. All these officers are bound to attend the chapters of the order held in St. George's Chapel, Windsor, on St. George's Chapel, Windsor, on St. George's Chapel, Windsor, or St. George's day, where the installations of knights are held, and they are sworn to adhere to all the institutes of their shility. The peculiar dress which distinguished the order, and to promote its well-being to the best of their shility. The peculiar dress which distinguished the order of the Garter from other similar institutions, at its flest establishment, was a mantle, tunic, and of their shilty. The peculiar dress which distinguished the order of the Garter from other similar institutions, at its first establishment, was a mantle, tunic, and hood of bine cloth lined with ermine, that of the severeign differing from the knights by the fur of the lining being of miniver instead of ermine. All these three garments were embroidered with garters of blue and gold; and the garter itself was worn under the left knee, and was composed of dark blue velvet edged with gold, with the motio "Honi soit qui mal y pense" inferribed by it with letters of gold; the buckle and pendant were likewise of the same precious metal. Henry VIII. added a collar, composed of pieces of gold worked in the fashion of garters, the centres of each being alternately white and red (alluding to the junction of the York and Lancaster families in the house of Tador), and these links, or garters, were exactly twenty-six in number, typical of the strength of the order. He also added the greater and lesser Georges, which copies of gold medallions with the figure of St, George and the Dragon thereon in relief,

Charles II. made the last alterations, substituting crimson for the surcost and head, and a lining of white taffets instead of ermine. The ribbon by which the medallion of St. George is suspended over the left the medallion of St. George is suspended over the left shoulder is of blue,—whence the expression "receiving the blue ribbon," instead of being installed a member of the order of the Garter. Down to the reign of Edward IV, some hairs, as the queen, &c., were ad-mitted to share in the honours of this magnificent. mitted to share in the honours of this magnificent fraternity; and the splendid appearance of Queen Philippa, clad in some of the habiliments of the Garter, is mentioned by Froissart as very imposing. The dress and ceremonies are at present exactly as they were when first instituted, with the exception of the alterations above mentioned; and the Garter is still held to be, and will no doubt continue to hold its fame of being, the first order of the kind in Europe in every sense.

sense.

GARTER KING-AT-ARMS, the fourth officer of the order of the Garter, is rendered exceptional from the circumstance of his being also the principal officer in the College of Arms, and chief of the heralds. He was first elected by the universal consent of all the knights companions in the reign of Henry V. The services which he afterwards performed were previously done by the Windsor herald-of-arms, an officer orested by Edward III. The cath administered to him on done by the windsor nersia-or-arms, an omore created by Edward III. The oath administered to him on appointment is, to yield obedience to the sovereign and knights companions; to keep silence, and not disclose the secrets of the order; to make signification of the death of each knight companion; to execute faithfully all things committed to his care; to inquire diligently after all the noble acts of the knights companion; and armiting the secret of the knights companion. panions, and certify the same to the registrar; and, handly, said the same as that of the other offices. His dress is the same as that of the other officers, and differs but little from that of the knights of the order.

differs but little from that of the knights of the order. Gas, gis (probably from Ger. geist, a spirit), in Chem.—This word was first applied by Van Helmont to denote any permanent vapour produced from solid or liquid substances by chemical action. The elementary gases are,—bydrogen, oxygen, nitrogen, and chlorine. The principal compound gases are,—hydrochloric, hydrobromic, and hydriodic acids; sulphureas acid, nitrous acid, peroxide of chlorine, chlorous acid, hypochlorous acid, carbonic acid, sulphuretted, phosphoratted, seleminetted, and telluretted hydrogen; cyanogen, protoxide of sitrogen, deutoxide of nitrogen, earburetted hydrogen, olefisht gas, carbonic oxide, and ammonia.

ammonia.

GAS, MANUFACTURE OF.—The term gas is popularly applied to the important material which is produced by the destructive distillation of coal, those species by the destructive distillation of coal, those species being chosen which contain the largest amount of hydrogen. When coal is burnt in the open air, or in an ordinary stove, the principal products are carbonic acid and water, small quantities of ammonia and sulphurous acid, and finely-divided carbon in the form of phurous acid, and meey-civided caroon in the form of scot. When, however, coal is burnt in closed vessels, the products are much more numerous and complicated. The most important gaseous matters are marsh gas, olefant gas, hydrogen, carbonic oxide, carbonic acid, sulphurous acid, sulphuretted hydrogen, and ammonia. The liquid portions contain water, a nome soid, sinpurrous soid, sinpureretted syrrogen, and ammonis. The liquid portions contain water, a mixture of benzol, toluol, camol, and other hydrocarbons, commonly known as cond-ton mapthia, and dark viscous substance called coal tar. To render the gaseous products available for lighting purposes, all the shove-named, except the march gas and the elefant gas, must be abetracted, not only from their interfering with the illuminating power of the gas, but from their combustion being deleterious to health. Thecarliest attempts at illumination by this means were made by Mr. William Murdock in Cornwall, about the year 1792, who carried on his experiments for several years, until he succeeded in illuminating a large portion of the manufactory of Boulton & Watt at Soho, near Birmingham, to celebrate the peace of Amiens in 1802. Ten years afterwards the Chartered Gas Company made the first great experiment of lighting the streets with gas; from which time the employment of this material has gone on steadily increasing, until the whole of the large towns and most of the small towns of England and the contingat are illuminated by its means. The coal used for this purpose is that found

# Gas, Manufacture of

in the Durham coal-field, known as Newcastle coal, a in the Durham coal-field, known as Newcselle coal, a ton of which will yield nearly 10,000 cubic feet of gas, leaving behind shout 13 cwt. of coke of excellent quality. From Scotch coal is obtained a gas of higher illuminating power; but the quantity is smaller, and the coke produced is inferior. The average yield of coke is about 13 cwt. per ton. The process of manufacture is briefly as follows. Pit coal is heated in long flattened cylinders of clay or iron called retorts, arranged in long brick furnaces. The mouths of the retorts are fitted with morable ilds, which may be rendered air-tight by clay tubing. From the upper side of the end of each retort proceeds a tabe, which dips into a larger tube containing the tar and condips into a larger tube containing the tar and con-densed moisture called the hydraulic main. The gas passes through the tar and water, leaving a small por-tion of these substances behind it with a serpentine arrangement of tubes termed refrigerators, which arrangement of tubes termed refrigerators, which separate the remaining portions of water and tar. From the refrigerators it passes to the time-purifiers, which consist of large cylindrical vessels containing perforated shelves upon which the dry slaked lime is placed. Lastly, it passes through dilute sulphurio acid, by which means the last portions of ammonia are removed. In certain works the last washing with acid is superseded by a process termed scrubbing, which consists in passing the gas through a vessel filled with coke, upon which a stream of water is constantly trickling. The gas is stored in large reservoirs or gas-meters, the general shape of which is that of a cylinder, closed at the top, and floating, or suspended, with its open end in a reservoir of water. The dimensions of the gasometer are regulated by the geometrical law of the gasometer are regulated by the geometrical law that a cylinder has the greatest capacity with a given surface, when its height is equal to half its diameter; hence the capacity of the gasometer is such that, when raised to its highest point in the water, its height is equal to the radius of the base. It is customary, however, to increase this height by one or two feet in order to prevent the gas from escaping under the edge. Thus a gasometer capable of holding 30,000 cubic feet of gas has a diameter of 42 feet and a height of 23 feet. On account of the enormous consumption of 23 feet. On account of the enormous consumption, of gas in London and other large towns, the gas-works which supply them require to be provided with very large gasometers. They are made of sheet-iron plates, riveted, and coated with tar on both sides, in order to make the joints gas-tight. The covered cylinder is suspended in the water by means of a chain, and counterbalanced and guided by weights and wheels, so as to rise and fall with ease. Two tubes pass under and through the water reaching above its surface into as to rise and fall with ease. Two tubes pass under and through the water, reaching above its surface into the hollow of the gasometer. One of these admits the gas from the purifiers and the other carries it off when required for use. When full of gas, the gasometer is near the top of the water; and by lessening the counterbalancing weight, it is pressed down, and the gas forced out through the other pipe, which conveys it to the mains. As the gasometer voids the gas, it to the mains. As the gasometer voids the gas, it inks and fills with water, when it is again ready to receive a fresh supply of gas. Most gas-works are supplied with a number of gasometers, some filling, and others emptying; and nearly every gasometer is now furnished with some contrivance which indicates the exact quantity of gas which it contains. The gasometers above mentioned require a large space of ground, as so much depends upon the diameter of the ground, as so much depends upon the diameter of the cylinder. This fact led to the invention of the telescope gasemeter, which, with the same diameter, will hold a larger volume of gas without increasing the uses of the ground. This gasemeter consists of two, three, or more concentric cylinders, the bottoms and tops or more concentric cylinders, the bottoms and tops of which, except the uppermost, are furnished with flanges furned in opposite directions, the flange turning or outwards and upwards at the bottom, and inwards and downwards at the top. When the gas is introduced, the innermost cylinder rises first, and when its bottom flange catches the flange of the next cylinder, which also rises; and when this has risen sufficiently high it if its the next; and so on. The secape of gas and the admission of air are prevented by the lower flange of each cylinder taking up a quantity of water, which acts as water-late. These gesometers are usually anspended at three points in their circumference by three

### Gascomade

chains running over pulleys attached to three pairs of pillars. It is of the greatest importance that the temperature at which the gassis produced should be regulated with great nicety. If the temperature be too low, the coal distils into liquid hydrocarbons, whilst, if too high, a great portion of the gas is burned in the retort; besides which, bisalphide of carbon is formed, which cannot be got rid of by any known process, and which, when burnt gives rise to vapours of sulphurous soid, to the destruction of the furniture of the spatiment in which it is used. In the United States of America methods of taking supplies of gas in steamboats and on railroad cars have been for some time in operation. By one plan sheet-iron cases, of the capachains running over pulleys attached to three pairs of pillars. It is of the greatest importance that the operation. By one plan sheet-iron cases, of the capacity of 50 or 60 feet, are fitted under the cars, and filled, as occasion requires, from the street mains under ordi-nary pressure. The tops of the cases are lined with a lose sheet of india-rubber, which swells upwards as the gas flows in beneath. To expet the gas for use, air is forced in above the lining by the action of a meter running by clockwork under uniform pressure.
The clockwork is impelled by a spring, which is wound
up by hand, and the action is suspended whenever the
valves for the burners are closed. The motion of the valves for the burners are closed. The motion of the cars does not affect the regularity of the supply to the burners. From the permeability of all flexible sheets, this process cannot be regarded as entirely safe from danger of explosion. By the method of the New York Car and Steamhoat Gas Company the gas is first compressed by a force-pump into strong cylindrical gasholders, made of boiler-plate iron, and measuring 7 or 8 feet in length, by about 14 inches in diameter. By the pressure of twenty atmospheres in diameter. By the pressure of twenty atmospheres thus not into a space of five cubic 100 feet of gas is thus put into a space of five cubic feet. To secure a uniform rate of discharge when the cylinders are connected with the gas-pipes of the car or steamboat in which they are carried, a regulator of improved form is attached to the pipes, which the aperture through which the air passes is gradually made to enlarge with the diminition of pressure. In Jersey city a stack of cylinders, conpressure. In every only a scale of syndron, our neeted by small pipes, seve as a reservoir, into which the gas is pumped at a pressure of 450 lb. From this a pipe extends to the railway station—a quarter of a mile distant,—and as the cylinders attached beor a mile distant,—and as the cylinders attached be-neath the cars require a new supply, they are simply connected with this pipe and directly filled. The Meropolitan (Underground) Railway Company also light their carriages by means of portable gas, which is stored for use in cisterns piaced upon the roof of the vehicle. Gas as fuel.—Recently, gas has been applied in suitably constructed stores as a source of heat. Being under perfect control. and easily directed heat. Being under perfect control, and easily directed to produce the required effect, it has in many cases proved a most economical fuel. In summer it may be made to heat, in suitably-arranged apparatus, culi-nary and other utensils without materially adding to nary and other utensis without materially adding if the warmth of the apartment; while in winter, con-sumed in stores adapted for diffusing heat, it has been made to take the place of other fires; and the application is especially convenient when a fire is only occasionally required a little while at a time. In chemical laboratories gas has long been employed as fuel. It has been found particularly convenient for heating and complete and the distantion of the beating small crucibles; and by directing through the sygned burner in which it was consumed an annular concentric current of sir, intense heat has thus been attainable at any moment. It next came to be applied in many of the mechanical arts, and upright cylindri-cal stoves of sheet iron were contrived, in which the

cal stoves of sheet from were contrived, in which the gas, being ignited, heated by its combustion the tools placed for the purpose in the upper part of the atove. GARCONNADS, gds-con-said (Rr.), is a term used in the French language to denote a habit of boasting, or speaking beyond the truth in conversation. The name is derived from the province of Gascony, the inhabitance.

### Gases, Diffusion of

give the public an idea of the ability with which he had executed his task, gravely assured them that his translation was so much admired that it was to be translated back again into the language of the original

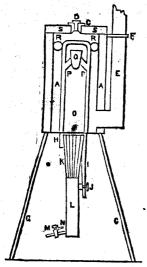
GASES, DIFFUSION OF. (See DIFFUSION OF GASES.) GASES, DIFFUSION OF. (See DIFFUSION OF GASES.)
GAS-EVERACE.—Messes. C. W. and F. Siemens have patented a regenerative gas-furnace, which promises to become of the highest utility. In a lecture delivered at the Royal Institution, on June 20, 1862, Professor Faraday thus described it:—"The gaseous fuel is obtained by the mutual action of coal, air, and water, at a moderate red heat. A brick chamber, perhaps air feet by twelve feet, and about ten feet high, has one of its end walls converted into a fire-reate.—i.e. about half down it is a solid plate and grate, ...i. e., about half down it is a solid plate, and for the rest of the distance consists of strong horisontal plate bars, where air enters, the whole being at an inclination such as that which the side of a heap of somal plate bars, where ar enters, the whole being at an inclination such as that which the side of a heap of coals would naturally take. Coals are poured through openings above upon this combination of wall and grate, and being fired at the under surface, they burn at the place where the air enters; but as the layer of coal is from two to three feet thick, various operations go on in those parts of the fuel which cannot burn for want of air. Thus the upper and cooler part of the coal produces a large body of hydrocarbons; the cinders, or coke, which are not volatilized, approach, in descending, towards the grate; that partwhich is nearest the grate burns, with the entering air, into carbonic acid, and the heat evolved ignites the mass above it. The carbonic acid passing slowly through the ignited carbon, becomes converted into arbonic oxide, and mingles in the upper part of the chamber (or gas-producer) with the former hydrocarbons. The water, which is purposely introduced at the bottom of the arrangement, is first vaporized by the beat, and then decomposed by the ignited fuel, and only the sabes of the coal are removed as solid matter from the chamber at the bottom of the fire-hare. The mixed cases form the cases form the and only the sakes of the coal are removed as solid matter from the chamber at the bottom of the firebars. The mixed gases form the gaseous fuel. The nitrogen which entered with the air at the grate is mingled with them, constituting about a third of the whole volume. The gas rises up a large vertical tube for about twelve or filteen feet, after which it proceeds horizontally for any required distance, and then descends to the heat-regenerator, through which it passes before it enters the furnaces. A regenerator is a chamber packed with fire-bricks, separated so as to allow of the free passage of air or can between to allow of the free passage of air or gas between them. There are four placed under a furnace. The to allow of the free passage of air or gas between them. There are four placed under a furnace. The gas ascends through one of these chambers, whilst air ascends through one of these chambers, whilst air ascends through the neighbouring chamber, and both are conducted through passage outlets at one end of the furnace, where mingling, they burn, producing the heat due to their chemical action. Passing onwards to the other end of the furnace, the combined gases find precisely similar outlets, down which they pass; and traversing the two remaining regenerators from above downward, heat them intensely, especially the upper part, and so travel on in their cool state to the shaft or chimney. Now, the passages between the four regenerators and the gas and air are like four waycocks in their action; so that by the use of a lever these regenerators and air-ways, which were carrying off the expended fuel, can in a moment be used for conducting air and gas into the furnace, and those which just before had served to carry air and gas into the furnace, now take the burnt fuel away to the stack. It is to be observed that the intensely heated flame which leaves the furnace for the tensely heated flame which leaves the furnace for the stack always proceeds downward through the regenerators, so that the upper part of them is most intensely ignited, keeping back, as it does, the intense heat: and so effectual are they in this action, that the games which enter the stack to be cast into the air are not usually above 300° F. of heat. On the other hand, the entering gas and air always pass upward through the entering gas and air always pass upward through the regenerators, so that they attain a temperature equal to a white heat before they meet in the furnace, and there add to the carried heat that due to their mutual chemical action. It is considered that when the furnace is in full order, the heat carried forward to be evolved by the chemical action of combustion is 913

### Gas-Furnace

about 4,000°, whilst that carried back by the regeneraabout 4,000°, whilst that carried back by the regenera-tor is about 3,000°, making an intensity of power which, unless moderated on purpose, would fuse fur-nace and all exposed to its action. Thus the regenera-tors are alternately heated and cooled by the outgoing and entering gas and air; and the time for alternation is from half an hour to an hour, as observation may indicate. The motive power on the gas is of two kinds—a slight excess of pressure within is kept up from the gas-producer to the bottom of the regenera-tor, to prevent air entering and mingling with the from the gas-producer to the bottom of the regenera-tor, to prevent air entering and mingling with the fuel before it is burnt; but from the furnace downward through the regenerators, the advance of the heated medium is governed mainly by the draught in the tall stack or chimney. Great facility is afforded in the management of these furnaces. If, whilst glass is in the course of manufacture, an intense heat is required, an abundant supplied of one and six is given; when the the course of manufacture, an intense heat is required, an abundant supply of gas and air is given; when the glass is made, and the condition of heat has to be reduced to working temperature, the quantity of fuel and air is reduced. If the combustion in the furnaces is required to be gradual from end to end, the inlets of air and gas are placed more or less apart, the one from the other. The gas is lighter than the air; and if a rapid evolution of heat is required, as in a short puddling furnace, the mouth of the gas inlet is required, as in the long tube-welding furnace, the recurred as in the contrary arrangement is used. Sometimes, as in the enameller's furnace, which is a long muffle, it is requisite that the heat be greater at the door end of the nuffle and furnace, because the goods, being put in muffle and furnace, because the goods, being put in and taken out at the same end, those which enter last, and are withdrawn first, remain of course for a shorter time in the heat at that end; and though the fuel and air enter first at one end and then at the other alter-nately, still the necessary difference of temperature is preserved by the adjustment of the apertures at those ends. Not merely can the supply of gas and air to the furnace be governed by valves in the passages, but the very manufacture of the gas-fuel itself can be but the very manufacture of the gas-fuel itself can be diminished, or even stopped, by cutting off the supply of air to the grate of the gas-producer; and this is important, inasmuch as there is no gasometer to receive and preserve the sëriform fuel, for it proceeds at once to the furnaces. Some of the furnaces have their contents open to the fuel and combustion, as in the puddling and metal-melting arrangements; others are inclosed, as in the muffle-furnaces and the flint-glass furnaces. The economy in the fuel is estimated practically as one half, even when the same kind of coal is used, either directly for the furnace or for the gas-producer; but as in the latter case the most worthless kind can be employed—such as slack, &c.,—which can be converted into a clean gaseous fuel at a distance from the place of the furnace, so many adwhich can be converted into a creat gaseous area as distance from the place of the furnace, so many advantages seem to present themselves in this part of the arrangement." Professor Faraday concluded his lecture with the following statistics:—Carbon, burnt lecture with the following statistics:—Carbon, burnt perfectly into carbonic acid in a gas-producer, would evolve about 4,000° of heat; but if burnt into carbonic oxide, it would only evolve 1,200°. The carbonic oxide, in its fuel form, carries on with it the 2,900° in chemical force, which it evolves when burning in the real furnace with a sufficient supply of air. The remaining 1,200° are employed in the gasproducer in distilling hydro-carbons, decomposing water, &c. The whole mixed gaseous fuel can evolve about 4,000° in the furnace, to which the regenerator can return about 3,000° more. A most useful and about 4,000° in the turnace, to whom the regenerator can return about 5,000° more. A most useful and powerful form of gas-furnace has been invented by Mr. George Gore, who thus describes it:—A is a cylinder of fire-clay about nine inches high and six inches diameter, open at both ends, with a bole in its side near the bottom, to lead into the chimney; it is covered by a morable plate of fire-clay (B), with a hole in the centre for introduction or removal of the crucible, &c.; this hole is closed by a perforated plug of clay (C), for access to the contents of the crucible, or clay (0), for access to the contents of the crumble, and that again is closed by another clay stopper (D). E is a chimney of sheet iron, about five or six feet high, kept upright by a ring of iron (F) attached to the top of the furnace. The fire-clay cylinder is inclosed in a sheet-iron casing, with a bottom of iron, to which are fixed three igon legs (G). An iron tube

#### Gas-Furnace

(H), with a prolongation (I), supports, by means of the screw J, the burner K, and its tube L, which is open at both ends. Gas is supplied to the burner by means of the tap M, which has a small index (N) attached to it for assistance in adjusting the gas. In-side the larger cylinder is another fire-olay cylinder, or cupols (O), with open ends, and with three projec-



GORE'S GAS-FURNACE.

tions of fire-clay (P) for supporting the crucible (Q). It is kept steady by means of three fire-clay marbles (R). The gas-burner is a thin metal cylinder deeply (M). The gas-burner is a tain metal cylinder deeply corrugated at its upper end, with the corrugations diminishing to nothing at its lower end. The action of this furnace is as follows. Gas is admitted to the open tube L by the tap M; it there mixes with air to form a nearly explosive mixture, which ascends through the burner and burns in the clay oplinder O, through the burner and what is the consider of the air necessary to complete combustion through the tube H to the outer surface of the flame by means of the spaces between the corrugations. The flame and products between the corregations. The name and products of combustion pass up through the cylinder O, and then downwards outside it to the chimney, the focus of greatest heat being at Q. It is important in using this furnace that the burner should be placed quite in the centre of the bottom of the tube O, also that a cracible of not too large, or not too small, dimensions the colorion of the tube O. The most suitable way of supporting erecible of not too large, or not too small, dimensions be selected. The most suitable way of supporting a smaller crucible is by placing it in a larger one that has had its upper parts broken off. If desirable, a little elsay luting may be placed round the top edge of the iron casing, to exclude air entering between it and the cylinder; also a little thin clay luting upon the part of the bottom of the furnace where the inner avoinder O rests. In lighting the furnace the place part of the bottom of the furnace where the inner ovlinder O rests. In lighting the furnace, the plugs C and D are removed, a light held inside the opening, and the gas turned on full. Should the flame blow down to the bottom of the tube L on lighting (which, however, rarely occurs, unless the furnace is already hot), the gas must be turned off and the bottom of L momentarily closed, whilst lighting the gas as before. Should the flame not burn down to the burner, but the prifice in the claysulate B. it must at Should the flame not burn down to the burner, but only burn at the orifice in the clay-plate B, it must at once be extinguished and relighted, otherwise some of the gaseous mixture will pass into the chimney unburned, and subsequently ignite and cause an explosion. A large flame now issues from the top orifice, and is white if too much gas is on, and chiefly violet or red with the proper quantity; it should now be

#### Gas-Furnace

coarsely adjusted until these appearances are presented. The annular ping C should now be inserted, which will compel it to pass downwands towards the chimney, and as soon as the small remaining fisme now issuing disappears, or nearly disappears, as it will in a few seconds, the small stopper D should also be inserted. In lieu of this, the large fisme may be defeated against the chimner by warms of a pince of flected against the chimney by means of a piece of aheet iron, until it withdraws inward, as before mentioned; the two plugs may then be re-inserted. The gas-tap may now be partly adjusted. The crucible should be placed in the furnace after the act of lighting the gas, but not impediately after it he formance. ing the gas, but not immediately after if the furnace is cold, or explosions may occur by unburned gaseous mixture passing the crucible into the chimney, and igniting afterwards. After about five minutes the gas should be slowly adjusted, until a sound is heard in-side like a series of small explosions. This sound is sometimes not very distinct, especially at high tem-peratures, and therefore requires a little experience peratures, and therefore requires a little experience in the use of the furnace in order to be detected. It is, however, a chief guide in determining the proper amount of gas, and should therefore be carefully studied. To, assist in adjusting the gas, it will be found very useful to place a small piece of locking-glass beneath the tube L, and to adjust the gas tap until the flame between the burner and the crucible appears wholly violet or slightly white. But this test is liable to fallacy if employed when the gas is just lighted, because the coldness of the parts makes the flame much whiter than it otherwise would makes the flame much whiter than it otherwise would haves the name muon whiter than it otherwise would be. It is also fallacious, the flame appearing whiter than it really is when the crucible is very hot. It is, however, of great use at intermediate temperatures. A rough deposit on the outer edge of the crucible indicates an excess of gas. The deposit is carbon. Less gas is required with a crucible in the furnace than Less gas is required with a crucible in the furnace than without one; also less is required when the small hole at the top of the furnace is open, than when it is closed; also less is required when the furnace is cold than after it has been lighted some time, because the draught gradually increases and draws in more air. After having accurately adjusted the gas, no further attention to the furnace is requisite. Having once found the proper adjustment of gas under certain known conditions, it is well to notice the position of the indexpointer N, in order to be able at once to adjust it to about the right point upon ether occasions. Under ordinary circumstances, during daylight, I have found it best to set the gas nearly full on at first, and fully on at five minutes afterwards, when the draught has on at five minutes afterwards, when the draught ha on at five minutes afterwards, when the draught has become more powerful; but during twilight, when the supply from the gas-works is more free, I have set the index-pointer at the numbers 2½ or S. The gas should be supplied by a pipe of not less than \$\frac{1}{2}\$-inch bore, with a main pipe of half an inch; but all dependation that the pressure of gas at the particular locality, which is very variable. The consumption of gas varies from thirty to forty cubic feet per hour, the value of which is about twopence. The top of the chimney should be placed in a nesition where the prochimney should be placed in a position where the pro-ducts of combustion can pass freely away. If it is placed in an opening or pipe leading to another chimplaced in an opening or pipe testing to shother ohim-ney, care must be taken not to have the draught too powerful, otherwise the heat will be drawn more into the chimney, and the supply of gas in the daytime may be found rather deficient. The furnace will act may be found rather deficient. The furnace will act satisfactorily, though less powerfully, with the chimney standing in an open room, without any special outlet for the products of combustion, provided the full height (6 feet) of chimney is employed. Under other circumstances, I have generally used a chimney 44 or 5 feet high. This furnace will produce what is generally called a "white heat." It will readily melt half a pound of copper or six ounces of cast from. Is will melt as large a quantity of those substances as the largest-sized crucible that can be introduced into it will contain, nufficient space being preserved around it will contain, nufficient space being preserved around the largest-sized orucible that can be introduced into will contain, sufficient space being preserved around the crucible for draught. It requires from twenty to thirty minutes to acquire its highest temperature, and then the entrance part of the chimney exhibits a faist red heat in daylight. If it exhibits much more than this, the draught is too powerful, and, if less, there is not sufficient gas. When the small hole D is open, some air is drawn in that way, and less air passes up

## Gaslight in Houses

Gases, Liquefaction of

with the gas through the tube. But the cold air does not much diminish the temperature of the crucible, because it combines with the excess of gas now passing over the edge of the inner cylinder; it, however, renders the flame round the crucible white by deficiency of air, and this should be partly corrected by lessening the gas. An excess of either gas or air renders the surface of the melted copper dull. When it is desirable to perfectly avoid contact of air with the fased substance during manipulation, a narrow crucible should be employed, and a thin and narrow ring of fire-clay should be placed upon the top of the tube O, to contract its opening; the flame then closes completely over the top of the crucible, and prevents access of air. A proper adjustment of gas, together with the exclusion of air in this manner, enables a perfectly bright surface of melted copper, or even tin, to be continuously maintained, from which the images of parts above are clearly reflected. The claying may be withdrawn by lifting the plate B. A less perfect exclusion of air may be obtained by employing a narrow crucible placed rather low. A small iron dish should be placed beneath the tube L, to receive any melted metal.—For a description of many ingenious forms of furnaces, the reader is referred to Ure's Dictionary of Arts, Manufactures, and Mines; and to Watta's Dictionary of Mechanics the following article relative to the consumption of gas inhouses:—'Serious objections stand in the way of the introduction of gasight into private dwellings, unless some means can be adopted for removing the products of combustion. For every cubical foot of gas burnt rather more than a crubic foot of carbonic acid is produced. A pound

a orbic foot of carbonic acid is produced. A pound of coal gas contains on an average 0'3 of hydrogen and 0'7 of carbon; it produces when burnt 2.7 of water and 2.56 of carbonic acid gas; consumes 4.26 cubic feet of oxygen, which is the quantity contained in 193 cubic feet of air. It is thus obvious that the air of a close chamber must soon be vitiated by the combustion of gas, and that the consequences of breathing an atmosphere impregnated with a large proportion of carbonic acid must, consequently, soon be felt by the inhabitants. The water evolved at the same time in the state of steam is found to be seldom same time in the state of steam is found to be seldom free from sulphurous and sulphuric acids, derived from impurities in the gas; and this condensing upon the furniture, books, goods in shops, &c., very soon damages them in a very perceptible manner. The large quantity of water evolved from the Bude burner in lighthouses, condensing on the glass windows, and materially impeding the passage of the light, attracted the attention of Mr. Faraday to the invention of some means for effectually removing the noxious products of combustion. After several more or less successful trials, he made use of a method which was a beautiful of combustion. After several more or less successuriarials, he made use of a method which was a beautiful adaptation of the principle of a descending draught to a lamp-burner. The invention sensisted of an ordinary Argand burner, with a common straight chimney; the glass-holder, however, was so constructed, as to sustain not merely the chimney, but an outer oplinder of glass also; the glass-holder was provided with an aperture, connected by a mouthpiece with a metal tube, which served as a ventilating-flue, and which, after passing horizontally to the centre of the chandelier, ascends to produce draught and carry off the products of combustion into the chimney or the open air. The outer cylinder was closed at the top by a plase of mics, or, still better, by two plates of mics, one resting on the top of the glass, and the other dropping a short way into it. They were connected together by a metal screw and nut, which also kept which had no opening, except at the bottom, for the admission of air to the burner. It is stated that the intense heat produced by the hot current of for the admission of air to the burner. It is stated that the intense heat produced by the hot current of air traversing the space between the two glass cylinders eases the glass to become more excless opaque, and thus obstrants the passage of the light. To avoid this objection, the same principle has been applied in a still more elegant and perfect manner, to a ventilisting form of gas-burner, in which the air for the flame descends through apertures in the top of a glass 914

cylinder, being afterwards carried off through a flue, when it has supplied oxygen to the flame and become vitiated. Ventilating burners of this kind not only prevent the diffusion of the products of combustion through the apartment in which they are erected, but, with the hot current of gas ascending through the metal tube, a large quantity of air from the room is also carried away, and thus a proper circulation established." Among the many commendable forms of gas-burners which have been brought under the notice of the public, the Whinfield lucent burner, in which the Liverpool button is applied to an Argand gas-burner, is among the best and most ingeniously constructed. The peculiar form of the chimney causes an external current of air to impinge at a certain angle upon the flame, producing the same affect as the metallic cone in the solar lamp. A basket of wire gauze is fitted into the crutch of the burner, which moderates the supply of air from below, and prevents the flickering caused by sudden draughts, by fixing the chimney to a circular ring, which acrews up and down upon the triangular support. Lowe, in his improvement upon this form of burner, alters the direction of the external current caused by the contraction of the chimney, and by converting the button into a screw, its height can also be altered and the internal current regulated.

GASES, LIQUEFACTION OF (in Chem.).—Many gases which are aeriform at ordinary pressures and temperatures, may be condensed into liquids, and even solids, by the combined action of pressure and cold. The experiments of Faraday in this direction have shown that the difference between gases and vapours is only one of degree, gaseous carbonic acid bearing the same relation to the solid gas that steam does to ice. The apparatus employed by this philosopher is extremely simple. It consists of a very strong tube closed at both ends and bent at an angle. One end contains the substances necessary for the production of the gas, while the other is immersed in a freezing mixture. Some of the gases are liquefied with greater facility than others; thus a mere reduction of temperature to 0° is sufficient to reduce sulphurous acid to a liquid state. The gases which have been solidified, up to the present time, are the following:—

Temp. of Solidification. at 32° F. Sulphurous acid...... -105° 1:59 atmos Cyanogen — 30° Hydriodic acid — 60° 2.37 ... 3.97 Ammonia.... -103° Sulphuretted hydrogen ... -122° 4.4 32. Protoxide of nitrogen ..... -150° \*\* 38.5 Carbonic acid..... - 70° \*\* Buchlorine ...... - 75° Hydrobromic scid ..... - 124° Fluoride of silicon ...... -220°

It will be observed from the — mark placed before the figures given above, that below 0° is meant. The following have only liquefied, having as yet resisted all attempts at solidification by combined pressure and cold:—

Chlorine,
Arsenetted hydrogen,
Phosphuretted hydrogen,
Hydrochloric soid.

The lowering of the temperature that takes place in the surrounding stmosphere during the passage of a gas from the liquid to the gaseous state, by the abstraction of an amount of heat sufficient for it to renter its aëriform condition, has been taken advantage of by M. Carré, an ingenious French mechanician, in his ice-machine. It consists simply of two strong iron ressels connected by a tabe, one of which contains strong liquor ammonias. Heat is applied to the liquor ammonias by means of a lamp or furnace. The ammonia immediately rises in vapour, and becomes condensed in a liquid form in the vessel at the other end. The lamp is removed, and the vessel containing the liquefied gas is plunged in another vessel containing the substance to be frozen. The liquid gas gradually reassumes the gaseous form, abstracting from the

#### Gas Meter

liquid to be frozen a sufficient amount of heat to com vert it into ice. The apparatus is perpetual, the only condition necessary for its use being its perfect airtightness

Ightness.

Gas Merru (Gr. metron, a measure), an instrument through which coal-gas is made to pass, in order to ascertain the quantity consumed in a particular time or place. They are divided into two classes,—wet and dry gas meters. The former usually consists of a cylindrical case, within which is snother cylinder, shut at both ends, and movable round an axis, divided into four parts. This vessel is so far filled with water, that the pine which conveys the gas into it just rises above it. plarts. This vessel is so a find it just rises above it.

As the gas enters, it causes the cylinder to move on its
axis, and as each volume of gas passes through, the
wheel of the axis, which works in other toothed wheels, registers, by means of an index, the number of cubic feet passing through the meter in a given time. The dry meter is an improvement on the wet, as the latter admits of fraudulent means being employed by The water in the wet meter is also the consumer. liable to get frozen in winter. Dry gas meters are made in various forms; one of the most simple and accurate is that of Defries. It is similar to that of Messrs. Croll & Richards, and both contrivances depend on causing the gas to fill expansible chambers of definite relationships of the alternate expansion and contraction of

causing the gas to fill expansible chambers of definite volume, the alternate expansion and contraction of which are registered by clock-work. Of late years dry gas meters have come tate extensive use in London. GASOMETER. (See Gas MANUFACTURE.)
GASTEROFODA, giz-ter-op'-o-di (Gr. gaster, stomach; poss, foot), a class of molluscous animals, whose means of locomotion consist of a fleshy disc or foot situated under the abdomen. They are both terrestrial and anustic, and maked and possessed of a shell. Of the aquatic, and naked and possessed of a shell. Of the

aquatic, and naked and possessed of a shell. Of the naked Gasteropoda the common slug will serve as an example. Among the terrestrial of the genus is found the snail; and among the aquatic, the whelk, winkle, &c. GASTRIC JUCK, gids-trik (from gaster, the stomach, is the name given to the digestive fluid contained in the stomach, and which is secreted by the gastric glands on the introduction of food or other foreign substance. It is a clear transparent fluid, inodorous, a little saltish, and very perceptibly acid. Its most singular component is a peculiar organic substance called pepsine, to which its special properties are chiefly owing. The use of the gastric juice is to dissolve the various kinds of food in the stomach, reducing the albuminous and gelatinous portions of it to a state fit for absorption into the system. It has also an antiseptic property, as it suspends putrefaction and restores the freshness of tainted meat.

GASTRITTS, gids-tri-tim (lat.), in Surg., denotes in-

restores the freshness of tainted meat.

Gastaffie, gda-tri'-tis (Lat.), in Surg., denotes inflammation of the stomach. It is known by pain in the
epigastric region, increased when anything is taken
into the stomach, vomiting, and hiccough; the pulse
small and hard; and general prostration of strength,
attended by fever and anxiety. It is produced by
poisons of various kinds taken into the stomach, as
arsenic or corrosive sublimate; by food of an improper
nature; by draughts of any cold liquid when the body
is much heated. It is a rapid and very dangerous
disease, and requires prompt measures to be adopted.
The means employed are copious and repeated general The means employed are copious and repeated general The means employed are comous and repeate general bleedings; the application of leeches to the epigastrium, followed by fomentations or the hot bath, after which a large blister may be applied. When sorid substances have been taken, mucilaginous drinks may be of use to aid their evacuation and protect the stomach, and when it arises from active poisons, the

stomach-pump may require to be used. GASTONERIUS, gis-tro-ne'-me-us (Gr. gaster, the sto-mach; kneme, the leg), is the name given to the belly or calf of the leg; and is also applied to two of the mucales of that part. The gastronemius externus arises by two distinct heads from the inner and outer condyles of the os femoris, which units a little below the oyies of the stemoris, which these states estowers in joint; and below it unites with the gastronemius internus, to form the tendo Achillis. The gastronemius internus, called also the soless, is situate immediately under the above, and rises by two heads from the posterior part of the head of the fibula and the upper and posterior part of the tibia. The nee of both these muscles is the same; namely, to raise the heal and extend the foot.

extend the foot.

### Guaging

GASTRONOUY, gds-iron'-o-me (gaster, the stomach, and nome, law), may be strictly defined to be the science of eating and drinking or, in short, the physiology of taste. In the classics we read of many names rendered celebrated by the fact of their being names rendered celebrated by the fact of their being excessive gourmands, or worshippers of good living, as Lucullus and Apicius; and, indeed, one Archestralus, of Syracuse, a contemporary of Pericles, has handed down to posterity a poem on the art of gastronomy, which has been translated by Ennius. This author is the first who appears to have treated on the subject, as M. Brillat-Savarin, who, in his Physiologic du Goût, has exhausted every argument which could be used in its favour, is the last. Gastronomy must not be confounded with cookery, from which it is wholly distinct. wholly distinct.

GASTROTOMY, gits-trot'-o-me (Gr. gaster, and toms, an incision), in Surg, denotes an incision into the cavity of the abdomen, an operation sometimes resorted to in desperate osses; as where, in consequence of a rupture of the uterus, the child escapes into the peritoneal

GATEWAY, gait'-way (Ang.-Sax.). — The gateways, or gatehouses, of the middle ages were most imposing structures; but, in the present day, this branch of architecture seems to have become neglected, or has architecture seems to have become neglected, or has fallen into disuse. They used to be erocted over the principal entrances of the precincts of religious establishments, colleges, and other buildings, and sometimes also in the courts of private houses, and those before castles and other fortifications. In military edifices, the entrance usually consisted of a single archway, with a charge door large another to a single archway, the entrance usually consisted of a single archway, with a strong door, large enough to admit carriages, and portculis at each end, with a vaulted ceiling pierced with holes, through which missiles might be rained down on an enemy. The sides of the gateway were generally flanked with large projecting towers pierced with loopholes, and the upper part terminated in a series of machicolations and a battlemented parapet. In civil edifices, the gateway admitted of much greater diversity of form. Sometimes it was formed of a single square tower, with the front ornamented; or it was extended to a considerable breadth, as at Battle Abbey, in Sussex. The gateways of religious houses had frequently a chapel attached to them. Examples of them may be seen in most of our old cathedral towns; as at Oxford, Canterbury, &c.—

them. Examples of them may be seen in most of our cold cathedral towns; as at Oxford, Canterbury, &c.—Ref. Glossary of Architecture.

GAUGE, gaipe (from. Fr. jauger, to gauge), an instrument or apparatus used for measuring the state of a phenomenon. Thus the gauge of an air-pump is a barometer, connected with the interior of the receiver, which shows the degree to which the air is rarefled. which shows the acgree to which the air is refrect. The wind-gauge, or automometer, is used in order to measure the force or velocity of the wind; and the water-gauge, or hydrometer, for determining the specific gravity of liquids, and thence the strength of spirituous liquors. (See ANEXOMERER, HYDROMERER.) In various and the property of the second o liquors. (See ANEMOMETER, HYDROMETER.) In various trades and manufactures, gauges of different kinds are employed; such as those used for measuring wires and sheet metals. These are generally thick plates of steel, of varied size and form, round, and near the edges of which, are drilled various holes, with notches sawed from the edge into every hole. Small parallel plates of hardened and tempered steel, called "drifts," are then driven into the notches in order to smooth the of hardened and tempered steel, called "drifts," are then driven into the notches, in order to smooth the sides and make them uniform. The Birmingham gauge for iron wire, and sheet iron and steel, differs from the gauge used for sheet brass, gold, silver, &c.; and both these differ from the Lancashire gauge for round steel wire. Many other gauges are used in par-ticular trades; such as the rod-iron gauge, the nail-rod gauge, the button-makers' gauge, &c.; others are used in watch-work; gum-makers also use a gauge for the bores of guns and rifles. Garange, and into. the method of determining by

bores of guns and rifles.

Gaveira, gai'-jing, the method of determining by actual measurement the number of gallons contained in ressels intended to hold goods; chiefly casks, barrels, vats, &c. The principal use of gauging is in the collection of the revenue, in which it is necessary to measure the bulk of vessels, without disturbing their contents. The principles of gauging are those which are furnished in geometry for the measurement of solids. As, however, the men who are engaged either in compares or by the excise, for the purpose of gauging, are not likely,

in general, to be acquainted with the principles upon which the art depends, a set of technical rules and appropriate instruments have been contrived, by which the art can be practised by any one of moderate intelligence. The instrument usually employed is the gauging rod, or diagonal rod, by which the contents of a cask are inferred from its diagonal length, measured from the bung-hole to the extremity of the opposite stave at the head. A scale of inches, for taking the transaure of the diagonal, is described on one face of a source rule, usually about four feet lone; and on the square rule, usually about four feet long; and on the opposite face is a scale expressing the corresponding contents of the cask in gallons. Although this method, obviously, can only give approximate results, yet, by using larger sliding-rules for calculation, and the aid of habit, derived from experience, it is possible to attain habit, derived from experience, it is possible to attain considerable accuracy in measuring the contents of casks, which do not depart much from a given standard of form.

of form.

GAULT, gawit, in Geol., the term which is applied to a series of dark blue marls or calcareous clays, which occur between the upper and lower greensand of the Chalk formation. It can be examined very well at Folkestone and Cambridge. The marine shells contained in it are often beautifully preserved, having been well packed and protected from atmospheric influences. The word "gault" is a provincial term for the clay itself, which is much used for brickmaking.

When decomposed it forms a very fartile soil and is When decomposed, it forms a very fertile soil, and is

the main repository of the phosphatic nodules which are now so highly prized by the agriculturist.

GAYELEIND, gdv'-el-k:nd, in Eug. Law, is a species of tenure of lands, which is supposed to have been, previous to the Norman conquest, the general custom of the realm, and which is found to this day in Kent, in consequence, it is said, of the success that attended the struggles of the Kentish men to preserve their ancient liberties. The origin of the term is much dis-puted. According to Coke, it is formed from "Gave puted. According to Coke, it is formed from "Gave all kinds; for this custom giveth to all the sons alike;" but the more generally received opinion is that it is de-rived from the Saxon word gavel, or gavel, signifying rent, or a customary performance of husbandry service; and hence the land which yielded this kind of service, as rent, or a customary performance of husbandry service; and hence the land which yielded this kind of service, as opposed to knight-service, was called garelkind. The chief distinguishing features of this kind of tenure are—(1) that the lands descend not to the eldest, youngest, or any one son only, but to all the sons together; but the issue of a deceased son inherits his sharp, whether male or female; (2) that the tenant is of sufficient age to aliene his estate by feofiment at the age of fifteen; (3) that the estate does not escheat in case of an attainder and execution, their maxim being "the father to the bough and the son to the plough." In most places, the tenant had a power of devising lands by will, before the statute authorizing the devise of lands generally was made. In default of sons, the land descends in equal shares to daughters; in default of lineal heirs, the land goes to the brothers of the last holder; and in default of brothers, to their respective issue. The husband is tenant by courtesy of a moiety of his wife's lands, whether there be issue or not, so long as he remains unmarried; and a wife is endowed of a moiety of the lands of which her husband died seized, during her chaste widowhood. Though

row, and pointed; eyes large, mild, and black. The size of the gazelle about equals that of the roebuck; but the legs of the former are considerably longer, and the entire form more graceful. The face and checks are reddish fawn-colour, with a dark stripe down the nose; on each side of the face, passing over the eyes, from the horns down to the nose, there is a broad white stripe, and beneath this, from the anterior canthus of the eye, a narrower dark stripe parallel to it and separating it from the fawn-colour of the check. The remainder of the body is dark fawn above and it and separating it from the fawn-colour of the cheek. The remainder of the body is dark fawn above and white beneath, the latter colour being separated by a broad brown band along the flanks. The knees are furnished with bruahes of dark hair, and the ears are filled internally with long white hair. It lives in large troops, and when pursued by the hunter, flees at great speed for some distance, then stands still to gaze on him, then bounds off again. When brought to bay, these animals defend themselves with courage and obstinacy, meeting in a close circle, with the females and fawns in the centre, and presenting their horns at all points to their enemies.

GAZETTE, gä-zet' (Ital. gazzetta), in Lit., is the name of certain newspapers in this country and on the con-tinent. It is said to be taken from gazzetta, the name of a Venetian coin worth somewhat less than a farof a Venetian coin worth somewhat less than a farthing, and which was the price of the earliest new-paper published in Venice (1563). According to others, it is derived from gaza, a treasure, or gazza, a magpic. The first fazette published in France (under that name) appeared in 1631, the first in England in 1685. The first fourteen numbers of the London Guzette were published at Oxford, the court being then resident there on account of the plague in London. It is published under suthority of the government. then resident there on account of the pague in London. It is published under authority of the government, and appears regularly twice a week, on Tuesdays and Fridays. It contains all proclamations, orders of council, and an account of all matters done by the queen in her official capacity; promotions and appointments to commissions in the army and nary; the appointment of ambassadors, consuls, and other civil officers of the higher ranks; also various matters connected with legal proceedings, notices of bankruptcies, insolvencies and sequestrations, dissolution of partnerships, &c. Notices of intended applications to parliament for private acts, relating to railways, canals, &c., require to be published in the Gazetts.

GAZETTERE, giz-et-teer', is, in other words, a dictionary of geography, a work giving an account of the different places on the face of the earth, under their particular names, in alphabetical order. The first work of this kind with which we are acquainted is that of Stephen of Byzantium, who lived about the beginning of the the content of the stands is the "Dictionarium Historico-Geographicum" (Geneva, 1868) we Charles Gischares with efficiency we W Lloyd. don. It is published under authority of the govern-

of fifteen; (3) that the estate does not escheat in case of an attainder and execution, their maxim being "the father to the bough and the son to the plough." In most places, the tenant had a power of devising lands by will, before the statute authorizing the devise of land generally was made. In default of sons, the land generally was made. In default of sons, the land descends in equal shares to daughters; in default of lineal heirs, the land goes to the brothers of the last holder; and in default of brothers, to their respective issue. The husband is tenant by courtesy of a molety of his wife's lands, whether there be issue or not, so long as he remains unmarried; and a wife is endowed of a moiety of the lands of which her husband died seized, during her chaste widowhood. Though the lands of Kent have now, for the most part, been disgouetted by particular statutes, yet the presumption is still in favour of this species of tenure until the contrary be shown—Ref. Robinson's Treatise of Gazekkind.

Gazor, gd-set (Fr. gavotte), a dance consisting of two light lively strains in common time, each being played twice. The first usually contains four or eight hars, and the second eight or twelve, and sometimes more. The first strain should close in the dominant or fifth of the key; for if it has its termination in the tonic or key-note, it is not a gavot, but a rondeau.

Gazelle, gd-zet/ (Fr.), (Antilope Dorcas, Pallas), one of the most beautiful and graceful of the antiloperation of the most beautiful and graceful of the antiloperation of the most beautiful and graceful of the antiloperation of the most beautiful and graceful of the antiloperation of the world, published by Fullation & Co. (7 vols. etc.) and finally forwards. The horns of the adult male rise nearly perpendicularly above the orbits, are black, almost cylindrical, bending at first gently back, and single Pronouncing Gazetteer of the United States of the United States are Lippincott's "Complète Pronouncing Gazetteer of the United States" (Philadelphia,

the World" (Philadelphia, 1856), and Harper's "Statistical Gazetter of the World."—Of other countries may be mentioned Möller's "Geographisch-Statistisches Lexikon" (1847); Ritter's "Geographisch-Statistisches Lexikon" (1847); Ritter's "Geographisch-Statistisches Lexikon" (4th ed. Leipsio, 1855); Hoffmann's "Encyclopsedie der Erd., Volker- und Staatenkunde" (Leipsio, 1855, et seg.); Krämer's "Geographisch Woordenboek" (Gouda, 1853); Castro's "Gran Dizionario Geografico" (Milan, 1855); "Dictionnaire Géographique universel," par une Société de Géographes (10 vols. Paris, 1822-33); Dictionnaire Géographique universel," par une Société de Géographes (13 vols. Brussels, 1839); Bescherelle's "Grand Dictionnaire de Géographic universelle, ancienne et moderne" (4 vols. Paris, 1856-7).—One of the most extensive and valuable Gazetteers of particular countries is the "Diccionario Geografico-Estadistico-Historico de España," by Pascual Madoz (Madrid, 1847-8), in 16 volumes.—A valuable dictionary of ancient geography is that recently published by Dr. William Smith. Nor under this head must we neglect to mention the geographical section of the "English Cyclopedis."

GEBENNA, ge-ken'-nd, is the Greek form of the Hebrew Ge-kinnow, the valley of Hinnom, and is used in Scripture to signify hell, or the place of eternal punishment. The valley of Hinnom was a narrow valley or gorge in the neighbourhood of Jerusalem, where the sewage and filth of that city was carried, and where perpetual circs were kept up to destroy the noxious matter. In later times et became a favourite

and where perpetual dires were kept up to destroy the noxious matter. In later times it became a favourite place for the celebration of idolatrous rites, and at a part of it, named Tophet, it is recorded that the abominable practice of infant sacrifice was exercised.—Hence the terms Gehenna and Tophet came to be synonymous

GELATINE, or GELATIN, jel'-ă-teen, jel'-ă-tin, an azo-tised principle, which has hitherto been obtained from animal tissues only. Bones, skins, flesh, and other parts of the animal, yield gelatine when boiled, but it does not appear to exist in a free state in any of these substances. Gelatine softens and swells in cold water, but does not dissolve until the liquid is heated. When the solution cools, it solidiles to a firm jelly; hence its name. It is insoluble in alcohol and ether, and may be precipitated from its aqueous solution by the former. With tannic acid it forms an insoluble compound of a buff colour, which is the basis of leather. It is also abundantly precipitated by solutions of corrosive sub-limate and bichloride of platinum. By continued boiling, gelatine is converted into metagelatine, which does not possess the property of gelatinizing as the liquid cools. The term is derived from the Spanish

figure coust. The verm is derived from the Spenisses gelating, from the Lat. gelo, I freeze.

Gelatine and Chue, in Manuf.—As gelatine is only glue in a greater state of purity, it will be as well to onsider the two substances under one heading. Glue

consider the two substances under one heading. Glue is obtained from the parings and refuse trimmings of or and other hides, which generally contain from 40 to 50 per cent. of glue. They are steeped for several days in lime-water, to remove the hair and blood, and then drained and dried in a current of air, in order that the lime may absorb carbonic scid from the atmothat the lime may absorb carbonic acid from the atmosphere. They are then boiled down in a copper containing a perforated false bottom, fresh clippings being added until the liquor gelatinizes in cooling. It is then kept at a gentle heat until the impurities have settled, and it is transferred to wooden boxes, or coolers, in which it is relativistic. and it is transcerred to wooden acceptance which it gelatinises. The blocks so formed are cut into cakes while soft, and dried in nettings, the threads of which leave the well-known cross-bar markings. The of which leave the well-known cross-bar markings. The drying is the most particular part of the process, a sudden rise of temperature will destroy the whole batch, by partially dissolving it; or a frost will split the cakes into fragments. Gelatine is simply glue which has been dissolved in a large quantity of water, and allowed to settle until colourless. Size is a less-tona-

thus forming ten times more jelly than a like weight of the best animal gelatine. Jelligs made from this sea-weed are much employed for food in Japan.

GRLOSE. (See GELIDIUM.)

GEMINI, jem'-e-ni (Lat., the twins), in Astron., the third constellation, or sign of the zodiac. The title is referred by the Greeks, not only to the fable of Castor and Pollux, but also to those of Hercules and Apollo, Triptolemus and Ission, Amphion and Zethus, &c. The name of the Twins is given to the constellation from two remarkable stars of the first and second magnitude, to which the names of Castor (or a Gemimagnitude, to which the names of Castor (or a Geminorum) and Pollux (or \( \beta \) Geminorum) are given. These two stars, when once known, can be easily recognized on account of their proximity. By drawing a straight line through the belt of Orion and the two bright stars, the line of which cuts through the belt, the Gemini may be easily found; for the straight line, when lengthened upwards, will pass very near the two stars. They are also about halfway between Regulus and Aldebarau; and when Orion and the Great Bear are seen together, Capella on one side and Castor and Pollux on the other, form the most conspicuous boundary-marks of the space between.

Gemore, ge-mote' (Ang.-Sax.), was the name of certain motes or courts held at certain times among the Angle-Osaxons; as the shire-gemote, or county

the Anglo-Saxons; as the shire-gemote, or county court, which met twice a year; the burg-gemote, which met thrice; and the hundred-gemote, which assembled every month. The witens-gemote was the great national council of the Anglo-Saxon kings.

met turice; and the innered-gemote, which assembled national council of the Anglo-Saxon kings.

GEMS, jems (Lat. gemma, a precious stone), a term commonly applied to all precious stones, and particularly to those which are used in jewellery. They are usually cut by the lapidary and set in gold, or carved as signets for rings, &c. The chief objects desired in minerals of this kind are brilliant lustre, perfect transparency, and richness of hue. Amongst those gems which are cut, the diamond holds the first place for brilliancy of lustre, or water, as it is termed. (See Diamond.) The oriental ruby is next in value, when of considerable size, of perfect transparency and rich colour. It is chiefly found in the Capellan mountains, near Syrian, in the kingdom of Ava. The sapphire, which varies from a dark rich blue to a pale and almost colourless tings of the same hue, holds the next place. It is found in comparatively large masses in Ava and Ceylon. The emerald, with its peculiar rich green colour, is held in high estimation by Eastern monarchs. The aquamarine is a pale blue variety of the globe; and for the striking changes which it undergoes when it is exposed to heat, and the fine colours which it naturally displays, is peculiarly suited to the lapidary's art. Garnets of very rich colour are obtained in Ceylon and Greenland. Chrysolites of a pale green colour come from Constantinople; deep red hyscinths from Ceylon; and tournalines of various hues from most parts of the world. Other stones also come under the designation of gems. Among these may be mentioned the opal, and many varieties of quartz, such as the amethyst, sarde, onyx, cat's-eye, and agate. The art of engraving on gems is very old, although it has been doubted whether the ancients understood the method of cutting the diamond, or sculpturing the emerald and topaz. The Eastern nations are still unacquainted with the proper mode of outting and polishing the diamond. In the year 1500, an Italian, named Ambross Caradopo, engraved the portrait of a father o named Ambrose Caradopo, engraved the portrait of a father of the church on a diamond, which he sold to Pope Julius II., a great patron of the arts, for £5,500, a large sum for that period. His example was followed by other artists, diamond-dust being employed in reducing the gem. The minerals most used for purposes of engraving, both in modern and ancient times, are not mystel or opening of various column and decious kind of glue, made from parchment parings and the thinner pieces of skins.

General Stromer Strome St

### Gendarmes

the decline of their country, the Greeks became much more eminent for their gems than any other nation of antiquity. They practised seal-engraving at an early period, but apparently not upon stones. Many cele-brated names of engravers before the era of Alexander brated names of engravers before the era of Alexander have been handed down. Among others, that of Theodore of Samos, who engraved a lyre on a celebrated emerald belonging to king Polyoretes 750 years before Christ, which the owner, to mortify himself, threw into the sea. Between the period of Alexander and the Augustan age, the chief gem-engravers were Admone, Apollonides, Polyetetes, who was also a sculptor, and Tryphon. The taste for engraving on precious stones was still preserved by both Greeks and Romans during the earlier part of the dark ages. With the introduction of Christianity, the art languished, and after the 7th century it almost entirely disappeared, and remained in obscurity till the 15th century, when it was revived by the Italians. From this tury, when it was revived by the Italians. From this period, engraving on gems fluctuated greatly, and it was some time before the art was fully re-established. Modern gems are considered inferior to those of aucient times; and hence many attempts have been made to substitute fictitious gems for those which are real. These are produced in three different ways;—either by attempting to improve a precious stone, or by producing an absolute counterfeit of it, or by inscribing the name of an ancient engraver on a production of modern origin. Independently, however, of these methods of producing counterfeit gems, the ancients were acquainted with several expedients for making nrtificial gems, and chemists in all ages have turned their attention to this branch of art. In modern times, Mitscherlich, Brothier, Gauden, and others, have suc ceeded in producing artificial rubies, corundum, blue and red spinelle, garnet, and emeraid, by crystallizing mixtures containing their component parts at exceedingly high temperature. The artificial gems produced were found to possess all the properties of the real stones bether produced was to be about the red to th

stones, both in colour, hardness, and crystalline form. GENDARMES, zhau(g)-darm (Fr., from gens d'armes, mon-at-arms), is the name of a body of military police in France, comprising both infantry and cavalry. In the 15th and 16th centuries, the gendarmes constituted the most distinguished cavalry corps in the French army. Afterwards, in 1669, the name was transferred to a squadron of the royal household troops, who cone royal household troops, who constituted a kind of body-guard of the king. In 1791 this corps was abolished, and the name given to a body of police. It consists principally of soldiers taken from the army generally on account of intelligence and good the army generally on account of intelligence and good behaviour, and it is regarded as a kind of promotion, as they have better pay, and enjoy greater liberty. The corps still constitutes a part of the army, and is liable, in case of necessity, to be sent on active ser-vice. They have the character of being well-behaved and trustworthy men, and are frequently intrusted by government with the execution of matters of import-

ance and delicacy. They amount to about 25,000 men. GERDER, jen'-der (Fr. gendre, from Lat. genus, race, kind), in Gram., is the distinction of nouns according to sex. Nouns denoting the male sex are said to be masculine; those denoting the female sex, feminine; and those which denote neither male nor female are and also winds unon denote neutrer male nor female are said to be neuter (Lat. neutrins generis), of neither gender; and hence grammarians have come, somewhat incorrectly, to speak of three genders. There can, properly speaking, be but two genders, the maculine and the feminine, as the sexual distinction is the basis upon which this doctrine is built. There are many animals, however, of which it is difficult, or useless, to determine the sex; and there are also many things which cannot be so distinguished at all. These are which cannot be so distinguished at all. These are generally regarded as belonging to what is termed the nester genter. There are, however, certain ideas, as magnitude, strength, vigour, &c., which are considered as characteristic of males; while gentleness, timidity, submission, &c., are regarded as properties of females, which, when they come to be associated with a neuter noun, raises it to the masculine or feminine: thus we speak of the sun as ks, and of the moon as she. Abstract nouns and general terms are size usually regarded as feminines. The mesculine and feminine Abstract nouns and government of the meaculine and temmine regarded as feminines. The meaculine and temmine are sometimes denoted by different words, as boy, girl, horse, mare, cock, hen; sometimes by a change in the SIR

### General

termination, as count, countess; executor, executrix; songster, songstress; and sometimes by the addition of a word, as cock-sparrow, hen-sparrow, he-gost, she-gost.—Rel. English Cyclopadia, section Arts and Sciences.

Generations, je-ne-all-o-je (Gr. genealogia, from genos, race, and logos, account), is an account or enumeration of the ancestors or relations of a particular person or family. No nation was more careful to trace and preserve its genealogies than the children of Israel. Their serve its genealogies than the children of Israel. Their snared writings contain genealogies which extend through a period of more than 3,500 years, from the creation of Adam to the captivity of Judah, and even after that time. Josephus informs us that he traced his own descent from the tribe of Levi by means of public registers, and that, however dispersed and depressed his nation were, they never neglected to have exact genealogical tables prepared from authentic documents which were kept at Jerusalem. Since, however, their destruction as a nation by the Romans, all their tables of descent seem to have been lost; and however, their destruction as a nation by the Romans, and even the Levites, who are still distinguished from the rest of the people by the exercise of special honorary religious functions, are known as such only by being acknowledged as descendants of parents who exercised the same. The inequalities of rank and right which prevailed during the middle ages made genealogical inquiries highly important; and it was then that researches of this kind assumed RM form of a science. searches of this kind assumed the form of a science, which became closely connected with heraldry (which see). Very little critical care, however, was usually employed in such cases, the chief object being to trace the origin of families into the remotest antiquity. the origin of families into the remotest antiquity. Attempts to carry this to an absurd length are frequently manifested in the earlier genealogical works. Critical genealogical studies were not begun before the 17th century. Genealogical accounts are not only interesting to porsons who feel a more or less natural curiosity about their ancestors, but are also useful to the historian, as elucidating the often complicated relations of dynasties, families, claims, and controversies of successions, &c. They are also of importance in legal cases concerning claims of inheritance; and, indeed, are indispensable in states in which the enjoyment of certain rights is made to depend upon lineage or descent. A genealogy, or lineage, is frequently represented in the form of a tree (arbor consanguintitatis), giving a distinct view of the (arbor consenguintiatis), giving a distinct view of the various branches of the family, and the degrees of descent from the common progenitor, who is generally represented in the root or stem. Genealogical tables are either descending or ascending. The former are chiefly used in historical records, presenting the descendants of a certain person in the order of procreation; the latter, in documents of nobility, serving to show the claims of any man or family to the titles of paternal and maternal ancestors. Sometimes both forms are used together. Persons descended one from another successively, form a direct line; those descended from a common progenitor, but not one from another, a collateral line. The collateral line emanother, a collateral line. The collateral line em-braces the agnates, or the kindred on the father's side, and the cognates, or kindred on the mother's side

GENERA, jen'-e-ra (Lat.), the plural of genus (which

GENERA, in Mus., the different scales by which the Greeks regulated their divisions of the tetrachord, of the enharmonic, chrowhich there were three; viz., the enharmonic, chromatic, and distonic, all of which will be found treated

of under their respective names.

General, jeni-s-räi (Fr. général), the name of the highest military rank, with the exception of that of field-marshal, that can be conferred on officers in the British and continental armies. It is the title given to the commander-in-chief, unless he be a field-marshal, to the commanders of armies and military districts, and to the commanders of divisions and brigades, who exercise the functions of a general with respect to the different bodies of men under their respect to the different bodies of men under their command which compose the entire army in the aggregate. In the English army, general officers are of three grades,—generals, listenant-generals, and major-generals. In the French and continental services, the rank of general of division is equivalent to that of

lieutenant-general in our service, and that of general of brigade to the rank of major-general. The command of a division in our service is always given to a mand or a division in our service is always given to a lieutenant- or major-general, but the colonel of a regi-ment may command a brigade with the temporary rank of brigadier-general. The title seems to have originated in France about 1450, when John, count of Dunois, was made lieutenant-general of the French forces, or commander-in-chief, representing the sovereign, who had delegated to his lieutenant-general the performance of the duties that would otherwise have devolved upon him as actual commander-in-chief of the armies. upon nm as actual commander-m-ener of the semies.
The title came into use in England in the reign of
Henry VIII., when the appellation of captain-general
was given to the commander-in-chief of the England.
From that period the title of general, both alone and
distinguished by various prefixes, has been preserved
in the Dettick services. in the British service.

GENERAL ASSEMBLY. (See ASSEMBLY, GENERAL.)
GENERAL BASS, in Mus., is synonymous with thorough bass. (See Bass.)
GENERAL ISSUE, in English Law, is a plea which
thwarts or denies at once the whole declaration of the plaintiff, without offering any special matter whereby to crade it; as in action for wrong, "not guilty," or for debt, "not indebted." They are called the general issue because, by importing a general and absolute denial of what is alleged in the declaration, they amount at one to an issue, by which is meant a fact affirmed on one side and denied on the other. Formerly the effect of side and denied on the other. Formerly the effect of pleading the general issue was to leave everything open,—the fact, the law, and the equity of the case; but in this way much abuse crept in, and by statute \$2.4 Will. IV. o. 42, the plea of general issue was restricted to its proper and ancient province.

Generallissing, jen-e-rill-is-e-mo (Ital.), the name sometimes given on the continent to a general officer who has the chief command of two or more armins on

who has the chief command of two or more armies, or command of general officers who act independently of each other, and are subject only to the control of the generalisaimo or commander-in-chief for the time being. grand divisions of an army, which are also under the

GENERALIZATION, jen-e-ral-i-zai'-shun (Lat. generalis

GENERALIZATION, jen-s-rai-1-221'-zan (Lat. generalis, general), the act of extending from particulars to generals; the act of making general.

GENERALIZATION, in Log., "the act of comprehending under a common name several objects, agreeing in some point which we abstract from each of them, and which that common name serves to indicate." When we constitute that the server in the that common name serves to indicate." When we con-template several objects resembling each other in some part of their nature, we can, by attending to that part alone, assign them one common name, which will ex-press or stand for them all as far as they agree; and this is what is called generalisation. Another kind of press of stand for them all salars as takey speer; and this is what is called generalisation. Another kind of generalization is when, from observing that two or more objects have certain things or properties in common, that therefore they have others also in common; as where Newton, from the fall of an apple, discovered the law of gravitation. In this process of generalizing there is involved a principle which experience does not furnish, by which we aftirm not only that all heavy bodies which have been observed gravitate, but that all heavy bodies which have been observed gravitate, but that all heavy bodies which have been observed gravitate, but that all heavy bodies which have been observed gravitate, but that all heavy bodies. Whether they have been observed or not, do so. In this there is implied a belief that there exists a certain order in nature, and that, under the same circumstances, the same substances will present the same phenomens. (See Induction, Classification.)

Generations, Alternation of, jene-orai-shauz (Lat. generatio), a term applied by Professor Steenstrup to a series of phenomens connected with the mode of reproduction of many of the lower animals. In their development from the ovum to the adult state, a large number of these beings not only pass through

In their development from the ovum to the adult state, a large number of these beings not only pass through various stages, as exemplified in the insect tribe, but also possess the power of multiplying themselves at certain periods of their growth. The animals which exhibit this peculiarity have been called "nurses," and the phenomenon has been particularly observed in the Anophalm, Entozos, Polypifers, Salps, and Vorticelle. In the translation of Professor Steenstrup's work by the Ray Society, the abstraction of generations is fully described. The mode of development by means

of "nurses," or intermediate generations, is shown to be an ordinary phenomenon in sature. "The circumstance," he observes, "of an animal giving birth to a progeny permanently dissimilar to its parent, but which itself produces a new generation, which either itself or in its offspring returns to the form of the parent animal, is a phenomenon not confined to a single class or series of animals; the vertebrate class is the only one in which it has not yet been observed. It would consequently appear that there is something intrinsio in this mode of development, and that it occurs, as it were, with a certain necessity; on which account as it were, with a certain necessity; on which account is it were, with a certain necessity; on which account it will undoubtedly soon be recognized to a greater extent and more generally." If the whole system of development by means of "nursing" generations be collected and regarded in one view, it appears, as the essential feature in this course of development, that essental leature in this course or development, that the species is not fully represented in the solitary, full-grown, fertile individuals of both sexes, nor in their development; but that to complete their repre-sentation, supplementary individuals, as it were, of one or, of several precedent generations are necessary. one of or several precedent generations are necessary. The greatest incompleteness and the highest degree of mutual dependence is to be observed in the Campanularize and similar polypes, in which the generations representing the unity of the species are very unlike each other, and in which all the individuals are found into a part of male and the conditions of the species are very unlike each other, and in which all the individuals are unitie each other, and in which all the individuals are fused into an outward unity, or into a set of polypes. "They exist organically connected with each other, and are normally free only in their first generation, and, indeed, only in their earliest stage of development, and only for a short time; since the free-swimming collisted each way the stages about in the water at most for and only for a short time; since the free-swimming ciliated embryo swims about in the water at most for some hours, in order to find a suitable place for the foundation of a new polype stem. In the Coryne clavi-form polypes, the organic connection between the individuals and generations is rather more lay; the perfect gemmiparous or ovigerous individuals are pericer geminiparous or ovigerous individuals are usually quite free, often even at an early age; so that they do not attain their full development until after their separation from the "nursing" generations. In the Medusæ and Scalpæ, the generations which are connected together into one whole become more like each other." Among the Entozoa, similar attempts connected together into one whole become more like each other." Among the Entozos, similar attempts at becoming free and accomplishing a perfect growth are also described. The development of animals which do not belong to the water, but to the air, also presents similar phenomena, but in a still higher and more free stage. The propagation of the Aphides through a series of generations has been long known. In the spring, a generation is produced from the ora, which grows and is metamorphosed, and, without a previous fertilization, gives birth to a new generation, and this again to a third; and so on for ten or twelve weeks; so that in certain species which have been observed nine again to a third; and so on for ten or twelve weeks; so that in certain species which have been observed nine such changes have been noted. At last, there occurs a generation consisting of males and females, the former of which, after their metamorphosis, are usually winged; fertilization and the deposition of eggs take place, and the long series of generations recommences in the next year and in the same order.—Ref. Transactions of the Ray Society,—J. J. Steenstrup on the Alternation of Generations.

Generations.

Generations. Generations on account of its containing a narrative of the generation or pro-

name given to the first book of the Bible, on account of its containing a narrative of the generation or production of all things. The Hebrew name is Bereshith, 'in the beginning,' from its commencing with that word, Its history goes back to the very earliest ages of the human race, and extends over a period of at least 2,870 years. It gives an account of the creation, the fall of man, the settlements, genealogies, arts, religion, corruption, and destruction of the antedluvian world: of the re-peopling and division of the earth, the religion, corruption, and destruction of the antediluvian world; of the re-peopling and division of the earth, the dispersion of its inhabitants, the calling of Abraham, the rise and progress of the Jewish nation, &c. It is divided into two main parts, one universal and one special; the former being the ancient history of the whole human race, contained in chapters I.—XI., the latter the early history of the children of Jersal (XII.—L.). There are some critics who maintain that this book was not written by Moses; and there are certainly some passages of it that must have been written by some one after his death, as they refer to subsequent events; but that the book as a whole was Genii

written by Moses, there is little room to doubt. Much ingenious speculation has been expended, as to the manner in which Moses was made aware of what had taken place so many centuries before his own time. According to some, the different events recorded in the According to some, the different events recorded in the book were divinely revealed to him; others hold that he acquired his knowledge of them by tradition; and a third class, that he obtained it from old documents. The second of these is the commonly received opinion in this country, and the third is that which is generally maintained by the German theologians of the present day. Neither of the arriver second a "little present". day. Neither of these views necessarily militates against the belief in the inspiration of the book; for that divine gift would be necessary to enable him to distinguish the true from the false. We cannot help thinking, however, that if either or both of these had been the sole or only sources whence Moses had drawn his information, there would have been some allusion to, or evidence of it, in the book itself. His knowledge of the later events may, and probably was, obtained in this way; but we incline to the opinion that the earlier part of the book must have been the subject of divine revelation. book must have been the subject of divine revelation. For those that believe in prophecy, there is 'nothing hard of belief here; the one being a divine revelation of the future, the other a divine revelation of the past (Regarding the various subjects of controversy in this book, see CERATION, DELUGE, &c.) The authenticity of Genesis was distinctly recognized by Christ, and passages from it are cited in the New Testament, twenty-seven times literally, and thirty-eight times substantially.—Ref. Graves On the Pentateuch; Horne's Introduction to the Kernburger. Eighborn's Kinleting Introduction to the Scriptures; Eichhorn's Einleitung in's Alte Testament; Jahn On the Books of the Old Testament; Turner's Companion to Genesis.

Testament; Turner's Companion to Genesis.

Genii, je'-ne-i (Lat.), among the Romans were supernatural beings, corresponding to the demons among the Greeks. According to them, every human being had his genius allotted to him at birth, who guided and accompanied him through life, and conducted him out of the world at the close of his career. But not only persons but places, and even inanimate objects, were fabled to have their genii. The collective Roman people also had their genius, who was sometimes represented on coins. Those of the collective from a people also had their genius, who was sometimes represented on coins. Those of the women were called Junones. They sometimes held that each person was accompanied through life by two genii, a white and a black; the former good and favourable, the latter bad and unfavourable; at other times they believed in but one, which was black and white by turns. Divine honours were paid to the genii; and it was usual for each one to offer sacrifices to his genius on his birthday. The genii or diinns of the Rast hear was usual for each one to oner sacrinees to his genius on his birthday. The genii or djinns of the East bear little resemblance to those of the Romans. They are regarded as an intermediate class of beings, between angels and men, but inferior in dignity to both; and are not objects of worship. In poetry they are described as having been created out of fire, and as having scribed as having been created out of fire, and as having inhabited this world before its occupation by man, as the subjects of a certain Ján Ibn Ján. They rebelled, and God sent his angel Iblis, or Eblis, who, after conquering Ján Ibn Ján, rebelled against God, and set himself up in his room; whereupon God condemned him to attach providence. himself up in his room; whereupon God condemned him to eternal punishment. The djinns, like men, are some good and some evil. They cat and drink, are subject to passions and death, but may live for centuries. They are capable of becoming invisible, or assuming the forms of men, beasts, or monsters, at pleasure. They frequent baths, wells, ruined houses, seas, rivers, cross-roads, and market-places. The evil genii delight in mischief for its own sake, raise and direct whirlwinds, and dry up the springs of the desert. The ghouls are a subordinate class of evil genii, haunting deserts and burial-grounds. and killing and devouring deserts and burial-grounds. The ghouls are a subordinate class of evil genii, haunting deserts and burial-grounds, and killing and devouring men and women that fall in their way. The peris, or fairies, are beautiful female genii, who believe in God, and in Mahommed, his prophet, and do good to man. The Mussulman doctors believe in the existence of diluns, as supernatural beings; but their ideas of them differ much from those of the poets and romanoers.

GENIEA, section in Rot. a gen of the net ord

GERIFA, jew-i-pā, in Bot., a gen of the nat. ord. Cinchonaces. Some species have edible fruit; thus the G. americana, the lana-tree of South America, produces a delicious fruit called the genipap. In British Guiana a bluish-black dye is prepared from the injue of this fruit. the juice of this fruit.

Genius

GENISTA, jen-ie'-tă (Lat. genu, knee, in allusion to the angular or jointed appearance di its twigu), in Bot., a gen. of leguminous plants, three species of which are found wild in Britain. G. tinctoria, the dyer's broom, yields a good yellow dye, or, when mixed with woad (Isait tinctoria), a green.

GENISTYE, jen'-i-tiv (Lat. genitivus, Gr. genike), in Gram, is the name of the second case in the decicasion of nouns, generally indicating the relation expressed in English by the preposition of. "The Latin genitive," says Max Müller, "is a mere blunder; for the Greek word genike never meant genitivus. Genitivus, if it is meant to express the case of origin or birth, would in says Max Müller, "is a mere blunder; for the Greek word genike never meant genitivus. Genitivus, if it is meant to express the case of origin or birth, would in Greek have been called gennetike, not genike. Nor does the genitive express the relation of son to father. For though we may say 'the son of the father,' we may likewise say 'the father of the son.' Genike in Greek had a much wider, a much more philosophical meaning. It meant casus generalis, the general case, or rather the case which expresses the genus or kind. This is the real power of the genitive. If I say a bird of the water,' of the water' defines the genus to which a certain bird belongs; it refers it to the genus of water-birds."—(Lectures on the Science of Language.) In English, the genitive or possessive case is marked by the addition of the letter s, preceded by an apostrophe; as, the king's son, my father's horse. When the plural ends in s, the additional s of the genitive is omitted, and only the apostrophe'added; as, kings'sons. GENIUS, je'n-e.us (Lat., from gigno, I beget or produce), was the term applied by the aucient Romans to a class of spiritual beings which attended upon man. Every human being, according to them, had his special genius allotted to him at birth, to guide and direct him through life; and his general character and conduct was ascribed to the influence of his genius hence the word came to signify the natural powers and sbilities of men, more especially their natural inclina-

hence the word came to signify the natural powers and abilities of men, more especially their natural inclina-tion or disposition. In modern times it has come to be employed in a still more restricted and special sense, as signifying the very highest condition of the mental powers, the perfection of human intelligence. Like many other words of a similar kind, it is difficult or impossible to define it in words; but there is always or impossible to define it in words; but there is slways associated with it the idea of creative or inventive power. According to Emerson, it is the "constructive intellect" which "produces thoughts, sentences, poems, plans, designe, systems. It is the generation of the mind, the marriage of thought with nature." "The thought of genius is spontaneous; but the power of picture or expression in the most enriched and flowing nature implies a mixture of will, a certain control over the apportaneous states without which no productive. over the spontaneous states without which no produc-tion is possible." Genius produces what has never tion is possible." Genius produces what has never before been accomplished; "it is the advent of truth into the world, a form of thought now for the first time bursting into the universe, a child of the old eternal soul, a piece of immeasurable greatness." Its chief faculties are the reason and the imagination; and according as one or other of these faculties predominates, it becomes either scientific or artistic. "In the first case it seizes at once those hidden affinities which otherwise do not reveal themselves except to the most patient and rigorous application, and, as it were, intuitively recognizing in phenomena the unalterable and eternal, it produces truth." In the latter it seeks "to exhibit its own ideal in due and appropriate forms; it realizes the infinite under finite types, and so creates the beautiful." Genius is sometimes used to signify that talent or aptitude which we receive from nature for excelling in any one thing whatever. Thus we speak of a genius for mathematics as well as a genius for poetry; of a genius for war, for politics, or for any mechanical employment. The distinction between mechanical employment. The distinction between genius proper and talent is thus given by De Quincey:—
"Genius is that mode of intellectual power which moves in alliance with genial nature, i.e., with the capacities of pleasure and pain; whereas talent has no vestige of such an alliance, and is perfectly independent of all human sensibilities; consequently, genius is a voice or breathing which represents the total Lature of man, and therefore his enjoying and suffering nature; whilst, on the contrary, talent represents only a single function of that nature." And hence, also, it is, that, "besides its relation to suffering and cujoyment, genius always implies a deeper relation to virtue and vice; whereas talent has no shadow of a relation to moral qualities, any more than it has to vital senso."

CEES, jess (Lat.), was a term applied, in ancient Rome, to a clan or party, which included several families under a bond of alliance, whose religious ceremonies, sacrifices, &c., were performed in common. Persons who belonged to the same gens were called gentiles, and those of the same family were distinguished. gentiles, and those of the same family were distinguished by the term agnati. At first patricians only oould have the honour of being gentes; but, after the law passed which enabled the plebeians to intermarry with the higher ranks, the latter class likewise were admitted to share in the clanship; and hence there were both patrician and plebeian gentes, which, of course, often assimilated, by reason of the intermarriage law. The gens Cornelia may be mentioned as an instance of a gens: it embraced the families of the Lentuli, the Scipiones, the Cethegi, and many others too numerous to mention.

GENTIAN. (See GENTIANA.)

GENTIAN. (See GENTIANA.)

GENTIAN. (See GENTIANA.)
GENTIANA, jen-she-ai'nd, in Bot., the typical gen.
of the nat. ord. Gentianaces. The officinal gentian,
so well known for its bitter tonic properties, is the
root of G. lutea, a native of the mountains of central
and southern Europe. From gentian the Swiss prepare a spirit much prized by them as a stomachic.
The genus is stated to have been named after Gentius,
a king of Sclavonia, who discovered if

a king of Sclavonia, who discovered it.

GENTIANACEE, jen-she-an-ai'-se-e, in Bot., the Gen tiana fam., a nat. ord. of Dicotyledones, sub-class Corolliforæ. Herbs, or rarely shrubs, usually smooth. Leaves flora. Herbs, or rarely shrubs, usually smooth. Leaves usually simple, entire, opposite, sessile, and strongly ribbed; rarely alternate, or stalked, or compound; always exstipulate. Flowers almost always regular, variously coloured, axillary, or terminal. Calyx inferior, persistent, usually with five divisions, occasionally four, six, eight, or ten. Corolla persistent, its divisions corresponding in number to those of the calyx; estivation imbricate, twisted or in duplicate. Stamens as many as the segments of the corolla, and alternate with them. Over Lealled or provide the called with them. Overy 1-celled, or rerely pertially 2-celled, from the projection inwards of the placentas, with numerous ovules; placentas 2, parietal, anterior and posterior to the axis, and frequently turned inwards; style 1; stigmas 2, right and left of the axis. Fruit capsular, 2-valved, with septicidal dehiscence, or a berry. Seeds numerous and small; embryo minute, in the axis of fleshy albumen. The order has been divided into two sections or sub-orders, the characters of which are taken from the æstivation of the corolls. of which are taken from the estivation of the corolls. These are, Gentianeæ, with the corolls imbricate-twisted, and Menyantheæ, with the corolls plaited, or in duplicate. The plants included in the order are found in nearly all parts of the world, even in the coldest and the hottest regions. A bitter principle almost universally pervades them; hence many are used medicinally for their tonic, stomachic, and febrifugal properties. There are 64 genera and about 450 exercise.

GENTILE, jen'-tile (Lat. gentilis, from gens, a nation), a term used in Scripture to denote a pagan, or worshipper of idols. The Jews classed all the inhabitants shipper of idols. The Jows classed all the inhabitants of the earth, with the exception of their own peculiar race, under the general name of goim, which is equivalent to the Latin gentes, nations; and after a time the term Gentiles began to be applied in a reproaching instead of a general sense. All who were not circumcised and Jews, were regarded as Gentiles or heathens, and as such they were excluded as much as possible from all those privileges and relations by which the Jewish nation became so exalted. As the Gentiles were consequently, considered as outcasts and aliens were consequently, considered as outcasts and aliens were, consequently, considered as outcasts and aliens from the favour of God, it is not much to be wondered at that the Jews were very prejudiced against a Saviour and a Gospel which inculcated the union of the

man to the appellation of gentleman, or to determine a standard by which persons who claim to hold this rank, as undoubtedly it is, may be distinguished from those who possess no right to it. It is generally applied to all who compose the bulk of the great middle class of English society, consisting of professional men, merchants, and others largely engaged in trade and commerce, and all whose income or education raises them above the lower classes of the trading community. Strictly speaking, it is the title of one who bears coat-armour, and takes rank next to an equire and above a yeoman, or, according to the definition given by Jacobs, in the Law Dictionary, "one who, without any title, bears a coat of arms, or whose ancestors have been freemen; and by the coat that a gentleman giveth he is known to be, or not, descended from those of his name that lived many hundred years since." It of his name that lived many hundred years since. may therefore be said, with ruth and justice, that one who inherits the right to bear coat-armour from his father, and his mother if she be an heiress, is bond fide father, and his mother if she be an heiress, is bond fide a gentleman by indisputable right, and, if it were worth while to contest the point, is entitled to take precedence of all others to whom the title is conceded in virtue of their professional standing, income, or education. The original derivation of the word is from the Lat. gentilis, belonging to a tribe or gens, and home, a man. In the early days of Rome, the inhabitants of that city were divided into two classes,—the populus, or that portion of the community in whom all power lay, and the plebs, or commonalty. The populus, or body of the patricians or nobles, was further divided into tribes or gentes, and each gens into families, all the members of which bore the common appellation of the tribe. To belong to a gens or tribe, was to take the members of which bore the common appellation of the tribe. To belong to a gens or tribe, was to take rank among the nobles, and in after-times, when the privilege of admission to a tribe was conceded to men of plebeian origin, it was equivalent to the grant of a title of nobility by letters patent from the crown in our own times. Hence the term gentilis was applied to all who were free-born, being descended from free-born ancestors and belonging to a noble family; while that of sine gente, without family or standing, was applied to men of low rank and origin, and those that were

ancestors and belonging to a noble family; while that of sine gente, without family or standing, was applied to men of low rank and origin, and those that were born of slaves. The term has been adopted in all European languages of which Latin forms the foundation-stone and parent stock; while it is found in our own language in the word "gentleman," and gives the clue to the meaning of the expression "gentle," well-born, in contradistinction to its opposite "simple."—Ref. English Cyclopadia,—Arts and Sciences.

GENTLEMEN-AT-ARMS, a band of fifty gentlemen who were enrolled by Henry VIII., in the year 1509, to attend strictly about the royal person. They were first denominated "spears," but were afterwards called "gentlemen pensioners," which name they bore until the year 1834, when they were called gentlemen-at-arms. The members are elected exclusively from officers in the army or navy, who enjoy their half-pay at the same time that they receive their pension as gentlemen-at-arms. The officers are a captain, who has £1,000 per annum; a licutenant, with a salary of £500; a standard-bearer, with £310; a clerk of the cheque with £120; and forty gentlemen with £70 per annum each. The duty of the gentlemen-at-arms, in the present day, is principally to attend at drawing-rooms and leyees. What when they were first originateper annum each. The duty of the gentlemen-at-arms, in the present day, is principally to attend at drawing-rooms and levees; but when they were first originated, they had the exclusive privilege of bringing in the royal dinner, and placing the same on the table, a service which they still have the honour of performing at coronations; in reward for which latter service, the sovereign has often conferred the rank of knight-back on each of the follows or gentlemen of the bund. hood on one of the officers or gentlemen of the band, ordering the fees for the same honour to be paid out of the treasury. Their uniform is decidedly military, and very similar to that of the foot-guards, although on some occasions it has been assimilated with the

caviour and a cospel which inculcated the union of the two different sects, and placed the Gentiles on an equal footing with the Jews. Those of the Gentiles of the Gentiles of the Gentiles of the Gentiles of the many section in the New Testament, is sometimes identical with Gentiles.

Gentiles, Gentiles, Gentilhomme, from gentilloff, of good birth, and home, man).—It is a matter of difficulty to give a correct definition of what entitles a genera has thus become more copious as the study of the good birth.

natural history has progressed, and presents one of the difficulties which the student of zoology has to contend against. (See Special).

Genus, in Bot, the term genus is applied to a collection of species of plants which resemble one another in general structure and appearance, more than they resemble any other species. Thus the various kinds of brambles constitute one genus; the roses, another; the heath, willows clovers cake and as forth force. of brambles constitute one genus; the roses, another; the heaths, willows, clovers, oaks, and so forth, form also, in like manner, so many different genera. The characters of a genus are taken exclusively from the organs of reproduction, while those of a species are derived generally from all parts of the plant. Hence a genus may be defined as an assemblage of species which resemble one another in the structure and gene ral characters of their organs of reproduction. It does not necessarily happen that a genus should contain a number of species; for if a single one presents peculiarities of a marked kind, it may of itself constitute a genus.

GROCENTRIC, je-o-sen'-trik (Gr. ge, the earth, and

tention, a point, centre), an expression that is applied to the position of a planet as it would appear to an observer stationed at the centre of the earth. It is opposition to the term heliocentric, which is used to denote a planet's position as it would be seen by an observer at the centre of the sun.

Observer at the centre of the sun.

GROUN, jet-ods (Gr. gaiodes, earthy, from ge, the earth), in Min., a term applied to a round lump of agate, or other mineral, or to a mere incrustation of the same. Its interior is sometimes empty, and in that case the sides of its cavity are lined with crystals, as in agate balls. Sometimes it contains a solid movable nucleus, and sometimes it is discovered to be supported by the contains a solid movable nucleus, and sometimes it is discovered to be tilled with an earthy matter different from the external envelope.

GEODEY, je-od'-e-se (Gr. ge, the earth; daio, I di-vide), that science which enables us by measurement and direct observation to determine approximately the shape or figure of the earth, and ascertain the area of its entire surface, or any part of it, as well as the varia-tions in the force of gravitation at different parts of the earth. The figure of the earth was known to be nearly spherical some time prior to the Christian era, and even in the present day we are taught to consider its form to be that of a regular oblate spheroid, or its form to be that of a regular oblate spheroid, or sphere flattened at the poles, which is a sufficiently close approximation to its actual shape for all general and practical purposes. If the latitudes and longitudes of places on the earth's surface, deduced from geodetic measurements, coincided with those obtained from astronomical observations, the form of the earth would be that the form of the earth would be that of a regular spheroid of rotation; but there is such a difference in the results obtained by the two methods, that no regular shape can be assigned to the earth by which these results can be reconciled. measurements of arcs of the meridian that have been made during the 18th and 19th centuries, in various parts of the world, have, however, tended to show that the diameter of the earth from pole to pole is, to its diameter at the equator, as 289 to 300; but they have also served to prove that there is a dissimilarity of shape between the northern and southern hemispheres, and that the curvature of the earth's surface is different in meridional arcs of either hemisphere, that are at no great distance from each other; which shows that the earth cannot be a regular spheroid. The discrepancy in the shape of the hemispheres, and the irregularity of curvature in different parts of the same hemisphere, can only be accounted for by the supposition that the earth was once in a fluid state, and that the irregularity in the cooling, and consequent solidification of various parts, had produced a corresponding irregularity of form in its surface, and a departure from the uniform spherical shape, which it would have undoubtedly assumed under the influence of centriugal force, if the whole mass had been homogeneous, and the conditions under which it had cooled had been the same at all parts of its surface. The following is a brief notice of some of the more important attempts that have been made to obtain accurate measurements of arcs of the meridian at different parts of the earth's surface, with some account of the method by which trigonometrical surveys are made for this purpose, and for determining the area and obtaining correct delineations of large 922

tracts of country. Eratosthenes was the first who at-tempted to determine the length of a geographical degree, about 250 s.c. A degree was also measured in the plains of Mespotamia, rather more than a thousand years after, by order of the caliph Al Ma-moum; and in 1617 Willebrod Snell measured a degree of the meridian at Landon and assistant distributed. moum; and in 1017 whienrod duen measures a segree of the merdian at Leyden, and estimated it at about 68-75 English miles. There were, however, some errors in Snell's calculations, which he had detected himself, in Snell's calculations, which he had detected himself, but which he was prevented from correcting by his death in 1628. In 1633, Norwood measured the meridian from London to York, and obtained a tolerably accurate value of the degree. In 1671, Picard and La Hire effected the measurement of the meridian between Amiens and Paris, and obtained a result of 691 English miles as the length of a degree. This was followed, in the commencement of the 18th century, by the extension of the measurement of the meridian by the extension of the measurement of the meridian by the extension of the measurement of the meridian begun by Picard, to Dunkirk towards the north, and Collioure, in the Pyrenees, towards the south, when James Cassini, under whose direction the operation was completed, found the length of a degree between Paris and Dunkirk to be rather less than the result which was obtained by Picard, and also less than the length of a degree between Paris and Collioure, which gave rise to an idea that the length of a degree of the gave ruse to an aces that the tengua or a negree or one meridian must grow less in proportion to its distance from the equator, instead of greater, as it must do of mecessity if the form of the earth be that of an oblate spheroid. This caused Cassini and others to conjecture that the earth must be in the form of a prolate spheroid; that the earth must be in the form of a prolate spheroid; but this idea was shown to be erroneous by the measurement of an arc in 1736, in Lapland, to the north of the Gulf of Bothnia, from which it appeared that there was an increase, instead of a decrease, in the length of a degree of the meridian in proportion to its distance from the equator, although it was discovered that their computation errod in excess when a measurement. from the equator, attaongh it was discovered that their computation erred in excess when a re-measurement of the arc was made by Svanberg in 1802. While Maupertuis was measuring an arc of the meridian in Lapland, Bouguer and La Condamine, assisted by some Spanish officers, were performing the same operation near Quito, in Peru, an iron toise being used as the standard of measurement, which has since been adopted as the standard for the expression of the length of the greater number of the degrees that have been measured on the continent, all of them, indeed, laving been ultimately referred to this as the unit of measurement. In the measurement of the arc effected in Pern, the length of a degree was found to be about 68.72 English miles by the French mathematicians, and rather more by the Spaniards. The results, however, of the two measurements effected simultaneously in Peru and Lapland went far to prove that the form of the earth was that of an oblate spheroid. In 1752, Lacuille measured an arc of the meridian at the Cape of Good Hope, from which operation he obtained a result nearly equal from which operation he obtained a result nearly equal to the length of the degree measured by Picard be-tween Paris and Amiens, although the scene of his labours was about 30° south of the equator, while that part of France selected by Picard is 50° to the north of it; and, according to the received theory of the oblate-spheroidal form of the earth, the length of the degree measured at the Cape ought to have been less than that which was assigned to it by Leccille. The disthat which was assigned to it by Lacaille. The dis-crepancy has, however, been accounted for and ex-plained by Maclear, who has lately remeasured La-caille's arc. In 1791 the arc of the meridian of Paris was remeasured from Dunkirk to Barcelons, by order of the French Convention, to establish the length of the mètre, the new French standard of measurement, which was to be the ten-millionth part of a quadrant of the meridian. This was carried out with great care by which was to be the ten-minimonal part of a quantum on the meridian. This was carried out with great care by Delambre and Mechain; but an error has since been discovered in the work, which affects the length of the measured are to the extent of nearly sixty-eight toises, and makes the mètre to be shorter than it should be by a very small and trifling fraction of its present length.
The trigonometrical survey of the British isles was brought about by the means taken to establish a con-nection between the observatories of Paris and Greendection netween the conservatories of raris and threm-wich, which was effected by carrying a series of triangles from Greenwish to Dunkirk; this was performed by General Roy with great accuracy. The survey itself was commenced in 1791 by Gelonel Williams and

General Mudge, and has been continued by General Colby, Cotonel Hall, and Colonel James, who have been successively superintendents of the Ordnance Survey. In connection with the survey, an arc of the meridian was measured from Dunnose, in the Isle of Wight, to Saraford, in the Shetland islands; embracing an extent of nearly 10° 18°, the length of the arc being found to be a little more than 700½ English miles. In the course of this survey, bases of verification were measured on Housslow Heath, Salisbury Plain, and Misterton Carr in England; on Ehuddlan Marsh, in Wales; on Belhelvic Links, near Aberdeen, in Scotland; and on the shores of Loch Foyle, in Ireland. The base on Sslisbury Plain was remeasured in 1849. The trigonometrical survey of India was commenced in 1801, by Colonel Lambton, who measured an arc of the meridian from Punnee, near Cape Comorin, to Damargida, near Beder, in the Nizam's territories. He was succeeded by Colonel Everest, who continued the system of triangulation from Damargida to Kalianpur, in the plain of Seronj. Colonel Everest, however, considered that the work performed by Colonel Lambton and himself had not been carried out, from various causes, with that degree of nicety and precision which should distinguish works of this nature. He therefore recommenced his labours in 1830, from which the most satisfactory results were obtained, an arc of the meridian having been mest accurately measured by him, assisted by Captain Waugh and Captain Rennie, from Kaliana, near the Himalayas, to Damargida, the differ-ence of the results of the actual measurement of the basis of verification, and their length when computed basis of verification, and their length when computed from each other being but a few inches. The extent of the arc measured from Kaliana to Damargida, by Colonel Everest, was 11°27′33″; while that from Damargida to Punnee, measured by Colonel Lambton, was 9°53′40″; giving an entire length of 21°21′13″. In Europe, during the present century, General Krayenhoff has made a trigonometrical survey of Helland which is a continuation of Delamber's averser. Holland, which is a continuation of Delambre's survey of France. A survey of the Russian empire has also been made, and an arc of the meridian has been measured under the auspices of the Swedish and Russian sured under the auspices of the Swedish and Russian governments, extending from Fugelnaes, on the Arctio Ocean, to Ismail, on the Danube. This includes that portion which was measured in Lapland by Maupertuis, and subsequently by Svanberg. It is the largest are that has yet been measured on the surface of the earth, its length extending over 28° 8′. Two small arcs of the meridian have also been measured in Denmark and Hanover, with great care and accuracy; and an arc of the meridian of Königsberg, in Prussia, by Bessel, when he was engaged in connecting the triangulation of the Russian survey with that of Central Europe and France and England. By means of these surveys, all the principal observatories of the continent of Europe have been connected by a system of triangles, and the geodetical position of its chief cities, and most striking physical features, have been ascertained by actual measurement. In commencing a trigonometrical survey, the first thing to be done is to obtain a base-line, in terms of which the sides of the triangles and distances from station to station are to be computed. To effect this, a piece of ground is selected that is as level and open as possible. The extremities of the base are then marked by the intersection of lines on a plate of metal that is fixed on a block of wood driven firmly into the ground. The course of the line is determined by setting pickets in the ground between the extremities, in the manner adopted for setting out a straight line in surveying. (See Surveying.) The distance from one and of the base to the other is then measured with the most scrupilous care by means of chains or rods, with various appliances to correct their expansion or contraction under the influence of changes in the temperature of the atmosphere. The best of all the different kinds of measuring-rods that have been proposed for effecting this portion of the work with accuracy, seem to be the apparatus of compound bars of zinc and mon which Bessel used to measure the base for the Prussian survey; and that anyented by Colonel Colby, consisting of bars of brass and icon, with steel tongues at right angles to the bars at either end, by which the base on the shore of toch Foyle was measured. As 029

soon as the base has been measured from end to end its length is ascertained on a great circle of the earth, in terms of the standard to which the measuring rods have been referred. But in order that the results of different surveys may be more easily compared, the radius of this circle must be determinate, or, in other words, the radius of the earth at the level of the sea, and the length of the base obtained at a height above the sea-level, must be reduced to its length at the mean level of the sea, which is found by dividing the measured length of the base multiplied by the radius of the earth, by the sum of the earth's radius and the height above the sea-level at which the measurement of the base has been made. When this has been done, the triangulation is commenced, stations being chosen which form the angular points of the princi-pal triaugles. In doing this the sides of the triangles should be made as long as may be practicable, and angles that are very acute should be avoided; for if the length of the sides of the triangles be as great as may be possible, and their angles not too acute, but approaching as nearly as may be to an angle of 60°, there will be less lisbility to error, since a very slight disorepancy in the measurement of an extremely acute angle will give rise to considerable error in the length of any side of a triangle that may be computed from it; and in triangulation from any base, the greater the number of intermediate triangles the greater will be the error of a distance computed through the whole system of a distance computed through the whole system of triangles. After determining the stations, signals are erected, from which the angles of the triangles are measured by means of the theodolite. When the measured by means of the theodolite. When the stations are at a great distance from each other, lamps with reflectors have been used as signels when the observations have been made by night; and plates or hemispheres of polished metal, or pieces of lockingglass, as in the heliotrope invented by Gauss, when they have been taken by day. In observations made by day, piles of stones or wood have also been erected as signals which have been visible with a powerful telescope even at the distance of a hundred miles. When the observations have been made, the angles are When the observations have been made, the angles are reduced to the centre of the station, if the theodolite has been removed from the vertical line, passing through the signal itself, and forming its axis, to a position on either side of it, or in front of or behind it; and they are also reduced to the horizon by trigo-nometrical formulæ. They are also further corrected with regard to spherical excess, and their relation to each other through the whole system of triangles, and the length of the sides of the various triangles is then computed by the aid of trigonometry. As it requires an extensive knowledge of the science of mathematics to enable any one to comprehend the minutise of the operations, and the calculations by which geodetic surveys are effected, and the results obtained, it will be manifestly out of place here to give more than the above brief notice of the more practical features, in above brief notice of the more practical features, in such an elaborate and difficult operation, that may be intelligible to the general reader, and to refer those who may desire a greater insight into the science, to works written by those who have been engaged in carrying out the chief trigonometrical surveys in England and Wales, and on the continent. It should, however, be mentioned, that, in obtaining data for deli-neating the physical features of a tract of country contained within the limits of each of the great triangles of the entire survey, the surface thus bounded is subdivided into smaller or secondary triangles, and is subdivided into smaller or secondary triangles, and the position of the intermediate objects effected by the methods adopted in ordinary surveying.—Ref. Delambre's Méthodes Analytiques pour la Détermination d'un Arc du Méridien; Puissant's Traité de Géodésie; English Cyclopædia,—Arts and Sciences; Encyclopædia Metropolitana,—Figure of the Earth; Everet's Account of the Meavement of Two Sections of the Meridional Arc of India; Clarke's Account of the Principal Triangulation, dc., relating to the Ordnance Survey of the British Isles.

GROGMOSI. (See GEOLOGY.)
GROGMAPHIOLI DISTRIBUTION OF ANIMALS. (See

GROGRAPHICAL DISTRIBUTION OF ANIMALS. (See DISTRIBUTION OF ANIMALS.) GROGRAPHICAL DISTRIBUTION OF PLANTS. (See PLANTS, DISTRIBUTION OF.)
GROGEAPHY, je-og'-raf-e (Gr., from ge, the earth,

and graphe, a description), is that science by means of which we obtain a knowledge of this earth, both as it is in itself and at it is connected with a system of other similar bodies. It comprises a knowledge of its figure and dimensions; of the natural features, divisions, and productions of its surface; of the position of the various places upon it; and of its various inhabitants. It is usually arranged under three principal branches,—Mathematical, Physical, and Political. Mathematical Geography deals with the earth principally in its planetary relations, as a member of the solar system; a great part of this being common to it with astronomy; and hence it is sometimes termed astronomical geography. It treats of the figure, magastronomical geography. It treats of the figure, mag-nitude, density, and motion of the earth; of the movements of the other heavenly bodies which exert an influence upon it; the relative positions and distances of the various places upon its surface; and the representation of the whole or portions of its surface upon globes or maps. By mathematical geography, we ascertain that the earth is spherical in form, or rather what is called an oblate spheroid, being a little flatter what is called an oblate spheroid, being a little flatter. what is called an oblate spheroid, being a little flatter at the poles than at any other part of its circumscrence; that its mean diameter is 7,913 English miles, the equatorial exceeding the polar by 26 hiles; that its orbit round the sun is slightly elliptical, while its mean distance from that luminary is about 95,000,000 of miles; that it performs its revolution in 365 days, 5 hours, 48 minutes, 50 seconds, the mean rate at which it travels being about 68,000 miles an hour; that the eath has also a motion round its own axis, which it completes every twenty-four hours, and that it revolves round the sun with its axis constantly inclined to the round the sun with its axis constantly inclined to the plane of its orbit at an angle of 66° 32″. To the former of these motions we are indebted for day and night; to the latter, for the vicissitudes of the seasons. In order to determine the relative positions of different places upon the earth's surface, geographers have supposed certain lines or circles traced upon it. One of these, the equator, being equally distant from both poles or points of rotation, divides the earth into two hemispheres, the northern and southern. Another encircling line drawn at right angles to the equator and passing through the poles, divides it into the eastern and western hemispheres. Parallel to the equator and numbered from it, are the lines or degrees of latitude, of which there are ninety in the northern, and as many in the southern hemisphere. The equator is divided into 360 equal hemisphero. The equator is divided into 360 equal parts, and lines drawn perpendicularly from the points of division to the poles constitute the lines or degrees of longitude. They are numbered east and west from a certain meridian, as that of Greenwich, Paris, Washington, &c. The meridian of a place is a line passing through that place to the poles at right angles to the equator. All places lying in the same latitude have equal length of day and night at the same time, while all places in the same longitude have mid-day at the same length at the equator; but the former, on account of the flattening of the surface of the globe, are slightly elongated towards the poles, while the latter are slightly elongated towards the poles, while the latter gradually diminish in length as they recede from the equator. The length of a degree of longitude at the equator is 69 06 English miles. Each degree is divided into 60 equal parts termed minutes, and every minute into 60 equal parts termed minutes, and every minute into 60 equal parts termed/seconds; marked thus, ° '". On maps, the latitude is denoted by figures at the sides, the longitude by figures at the top and bottom. The top of a map is the north, the bottom the south, the right hand the east, and the left hand the west. As the earth revolves round the sun with its axis constantly inclined to the plane of its orbit at a considerable angle, it follows that the sun does not remain perpendicular to the equator; but is one half of the perpendicular to the equator; but is one half of the year to the north and the other to the south of it. An imaginary circle, marking the sun's vertical position with regard to the earth, is termed the celiptic, and cuts the equator obliquely at two points, termed the equinoctial points or nodes, the sun being then vertical to the sun that the sun terms of the sun terms of the sun terms. equinocusi points or nodes, the sun being then vertical to the equator. The vernal equinox occurs on the 21st of March, the autumnal on the 21st of September. The sun is vertical at different times of the year to all that portion of the earth's surface tying between 23°28' N. and 23°28' S. of the equator; and this region being subject to the greatest amount of heat, is called 924

the Torrid Zone, and is bounded on the north by a circle termed the Tropic of Cancer, and on the south by another termed the Tropic of Capridorn. The sun is on the parallel of 23° 28' N. on the 21st of June and on the parallel of 23° 28' S. on the 21st of December; termed respectively the summer and winter solstice. From this inclination of the earth's axis, it also follows that the whole region within 23° 28' of either pole, or, in other words, above 66° 22′ of N. or S. latitude, is, for a certain period of the year, involved in continual night or continual day. The northern of these regions is termed the North Frigid Zone, and is bounded by the Artitic girlls: the southern the South Friend Zone. is termed the North Frigid Zone, and is bounded by the Arctic circle; the southern, the Bouth Frigid Zone, and bounded by the Antarctic circle. Between the tropic of Cancer and the Arctic circle is the North Temperate Zone; and between the tropic of Capricorn and the Antarctic circle is the South Temperate Zone,—Physical Geography comprehends a description of the principal features of the earth's surface, as consisting of land and water, the different animal and vegetable products; climate, elevation and direction of mountain-chains, &c. (See PRISICAL GEOGRAPHE.) Political Geography describes the countries and nations of the earth as they are politically divided, and deals with mankind in their social aspect and organization. It gives an account of the laws and government of the different countries, their language, religion, civilization, resources, all of which fell to be treated of in the presources, an or which fell to be treated of in the pre-vious volume of this work, under the names of the different countries. Geography, in its practical appli-cation, "has for its object the determination of all those facts, as to any given country, which will enable us to judge of its fitness to provide man with food and to promote his civilization." It is thus a subject of the utmost importance; for it is well known that outward circumstances exert a very manifest influence upon mankind. The climate and physical characteristics of a country determine, in a good measure, the nature of its inhabitants, and its productions guide their pursuits, In order to convey a minute and correct account of a country, it is necessary for the geographer to separate the different parts from each other, and give a partic-ular account of each, following some general plan. The following plan will be found to be pretty complete; but of course it may require to be more or less modified, to out ourse it may require to be more ress monther, to suit particular cases.—Physical features: including an account of position, extent, and natural divisions of the country; its boundaries; the extent and character of country; it's boundaries; the extent and character of its coast; the height, form, and direction of its mountains; the extent and elevation of its plains; the character of its valleys; the length, direction, size, and velocity of its rivers; the nature and extent of its lakes and marshes; its springs.—Climate: account of, including variations of temperature; fall of rain; direction of prevailing winds; atmospheric pressure.—Geology: comprising an account of its geological formation, its various mineral resources, and the character of the soil.—Botany and Zoology: the number and distribution of the various species of animals and plants, their uses a ministering to the precessities or comforts of the of the various species of animals and plants, their uses a ministering to the necessities or comforts of the people, as supplying them with materials for labour, or as furnishing them with articles of trade.—Agriculturs: the extent of cultivated land, heaths, forests, pastures, &c.: state and progress of agriculture; modes of cultivation; agricultural implements; fertility of the soil; the different kinds of crops; their amount, and the proportion they bear to the wants of the people; the number of the various kinds of cattle, and their uses in agriculture or domestic economy.—Mining: the number, character, and productiveness of the mines; the ountities and values of the different ores raised; the quantities and values of the different ores raised; the progress of mining, and the modes of carrying on operations.—Fisheries: the various kinds of sea and river fisheries; their importance, and the means and manner of prosecuting them.—Manufactures: their progress and present state; the different branches of manufacture; their principal seats; their importance as contributing to the wealth of the country, or as affording employment and means of subsistence to the people; the amount and value of the labour expended upon them; the machinery employed; how far the raw materials are home-produced or imported; how far the manufactured articles are necessaries or luxuries; and how far they are for home consumption, or for exportation,—Commerce: the amount of the exports and quantities and values of the different ores raised; the

imports; the quantities and values of the principal articles; the principal ports; the countries with which trade is chiefly carried on, and the principal articles exported to or imported from each; by whom or underwhat flags the trade is principally carried on; how far the imports are necessaries or luxuries; how far for direct consumption, for manufacture, or for exportation; how far the exports are raw or manufactured goods, are the natural production of the country, or imported or manufactured. It comprehends also an account of the nature, amount, &c., of the internal or coasting trade.—Facilities for Commerce: the amount of shipping belonging to the country, distinguishing sailing from steam vessels; the character of the harbours; length of the navigable rivers and canals; nature and length of the roads and railways; nature of the conveyances.—Fopulation; the number of the nature and length of the roads and railways; nature of the conveyances.— Population: the number of the people at different times; the different races; rate of increase; emigration and immigration; proportion of the sexes, and the marriage relations; the different ages of the population; the average duration of life, and how affected by locality, climate, occupation, or mode of life; the nature and prevalence of certain diseases; the proportion of the population to the production, wealth, and consumption of the country.—Social Condition: the general character, disposition, and habits of the people; their manners and customs; their progress in civilization; the different classes of society; their numbers and relations to one another; the social condition and intellectual and moral culture of each; the number of and relations to one another; the social condition and intellectual and moral culture of each; the number of houses; distribution of wealth and power; occupations of the people; the proportion of capital to labour; skilled and unskilled labour; wages; price of provisions; amount of chief articles of consumption; national vices; pauperism.—Language and Literature: character and growth of the language; different dialects; affinity with other languages. The character, condition, and progress of its literature; the several branches in which it is principally distinguished; names of the principal and the of the principal authors; different classes of publica-tions; literary associations; public libraries; restric-tions on literature, or liberty of the press.—Science and drt: state and progress of; branches in which the country is chiefly distinguished; institutions for the promotion of, as academies, scientific associations, museums, picture-galleries, &c.—Government: its nature, form, and progress; the legislative, judicial, and executive functions, in whom vested, and how carried out the absence of its laws, the relief in the country is the second of the legislative. out; the character of its laws; the political divisions of the country; how far and in what way the different of the country; how far and in what way the different classes of the people are represented; public works, and other means adopted by government for the encouragement of industry and commerce, or for promoting the social and intellectual progress of the people.—

Religion: its character, condition, and history; its connection with the State; toleration; the various religious sects; number of ohurches, and extent of accommodation; the various classes of the clergy; their emoluments; the amounts and sources of the church revenues, as provided by the State, by voluntary contributions, &c.—Education: the number and character of the various seminaries of education; their efficiency; how supported; fees; the number of teachefficiency; how supported; fees; the number of teachers; their incomes; number and ages of the scholars, and their proportion to population, especially between the same ages; how far the State controls or interferes with education. — Crime: state of crime; different classes of offences; the social condition of offenders, classes of offences; the social condition of offenders, age, sex, education, &c.; number of convictions: proportion of convictions to committals; the different kinds of punishment; means employed for the punishment or detection of crime; prisons, reformatories, police, &c.—Defence: the natural defences of the country; its fortresses, &c.; the amount and efficiency of its army, navy, militia, &c.—Finances: amount of national debt, its nature and growth; the various sources of revenue; the gross and net amount received from each; proportion of income to expenditure; the various branches of expenditure.—Tazation: amount various branches of expenditure.—Taxation: amount of; its character, as direct or indirect; its several branches; the articles on which imposed; how levied; expenses of collection; how far protective or retalia-tory; effects on industry or commerce; recent altera-tions, and consequences of — Loney, &c.: the weights, 925

measures, moneys, &c., of the country, and their equivalents; banks and banking system, &c.—Antiquities: the different classes of antiquities; their character and age; their state of preservation, &c. Information on these various points, so far as they may be applicable to suy particular state or country, is necessary, in order to a thorough geographical knowledge of it, i. e., physically and socially,—in order to understand its present position, to trace the various circumstances by which it has arrived at that state, and to acquire some knowledge of the action and re-action that is constantly knowledge of the action and re-action that is constantly taking place among its various elements. The sphere of the geographer is thus a very extensive one, and demands of him to be familiar with a vast variety of anhienta

GEOLOGY, je-ol'-o-je (Gr. ge, the earth; loges, discourse or reasoning), that department of natural science which embraces all that can be known of the constitution and history of our planet. In the words of Mr. J. Beete Jukes, it is not so much one science as the application of all the physical sciences to the examination and description of the structure of the earth, the investigation of the processes concerned in the production of that structure, and the history of their action. The fact that geology rests upon all the natural sciences accounts for its modern origin. It was not till some very considerable advances had been made in all the sciences which relate directly to the earth, that geology could begin to exist in any worthy form. It was not till the chemist was able to explain to us the true nature of the mineral substances of which rocks are composed; not till the geographer and meteorologist had explored the surface of the earth, and taught us the extent and the form of land and and taught us the extent and the form of land and water, and the powers of winds, currents, rains, glaciers, earthquakes, and volcanoes; not till the naturalist had classified, and named, and accurately described, the greater part of existing animals and planta, and explained to us their physiological and anatomical structure, and the laws of their distribution in space,—that the geologist could, with any chance of arriving at sure and definite results, commence his researches into the structure and composition of rocks, and the causes the structure and composition of rocks, and no causes that produce them, or utilize his discoveries of the remains of animals and plants that are inclosed in them. He could not till then discriminate with certainty between igneous and aqueous rocks, or between living and extinct animals; and was, therefore, unable to any down any one of the foundations upon which his own science was to rest. To enable our readers to form a clear conception of the scope and methods of geology, we take the liberty of quoting the philosophical and lucid explanations given by the writer already alluded to. "There is another, and a more restricted cal and lucid explanations and a more restricted sense of the word geology, than the wide and general one in which we have been using it. This sense is rather the one formerly attached to the word geognosy (Gr. ge, the earth; gnosis, knowledge), by which we may understand the knowledge of the nature and position of the different masses of earthy and mineral matter of which different districts and countries are composed, without reference to the history of their composed, without reference to the history of their production. This was the early and simple meaning production. This was the early and simple meaning of the word geology, when considered as synonymous with geognosy; namely, the examination and description of the different varieties of rocks, and the minerals they contained. Geology was looked upon in the light of a geographical mineralogy; and even yet it is regarded more or less under this aspect by many persons. No one, indeed, could have anticipated, from the mere study of masses of stone and rock, where, to a partial and local view, all seems confusion and irregularity, the wonderful order and harmony which arise from more extended observation, and the almost arise from more extended observation, and the almost romantic, and seemingly fabulous, history which be-comes at length unfolded to our perusal. To discover comes at lengtu uniolded to our perusal. To discover the records on which this history is founded, and to understand their meaning aright, frequent long-continued and wide-spread observation and research in the field, and patient and conscientious registration, of the observed facts in the closet, are absolutely necessary. This collection and co-ordination of facts it is which is the record and co-ordination of facts it is which is the proper and peculiar business of the geognost. The ditch, the cutting, the quarry, and the mine; the cliff, the gully, and the mountain side, are

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his enbjects. These he has to study, to examine, to dissect, to describe the minutize of the structures they expose, and to classify and arrange the facts they may expose, and to classify and arrange the facts they may afford, depicting their lineaments on maps and sections, and recording them in written descriptions. The business of the geognosi, then, is to make out, from indications observed at the surface, and in natural and artificial excevations, the internal structure, the solid geometry of district after district, and country after country, until the whole earth has been explored and described. If, while so doing, he notes all those facts which may enable him or others to understand and explain how that structure has been produced, he then becomes a geologist. It might at first be thought becomes a geologist. It might at first be thought that, in order to make out the solid structure of lands and countries, it would only be necessary to understand the nature of the mineral matters of which they were composed, and that, for this purpose, no knowledge of organic or living beings would be required. It is, however, one of the most remarkable results of geological science, that an acquaintance with organic, and especially with animal forms, is at least as necessary for a geologist as a knowledge of minerals, and that a correct knowledge of organic remains (portions of lessil plants and animals) is a more certain and unerring guide in unravelling the structure of complicated districts than in unrarelling the structure of complicated districts than the most wide and general sequantance with inorganic substances. The cause of this necessity, puzzling and paradoxical enough, perhaps, at first sight, may be briefly stated as follows. When we come to examine the crust of the globe, we flud that its several parts have been produced in succession; that it consists of a regular series of earthy deposits (all called by geologist and of the complete of the constraints of the con a regular series of earthy deposits (all catted by geologists rocks), formed one after another during successive periods of time, each of great but unknown duration. Now the mineral substances produced at any one period of this vast succession of ages do not appear to have had any essential difference from those formed at another. We cannot, therefore, with any certainty, discover the order of time in which the series of rocks was formed, or the order of superposition, which they consequently preserve with regard to each other, from an examination of their mineral character or The animals and plants, however, contents only. living at one period of the earth's history were different from those living now, and different from those living at other periods. There has been a continuous suc-cession of different races of living beings on the earth, following each other in a regular and ascertainable order; and when that order has been ascertained, it is obvious that we can at once assign to its proper place of production, and therefore to its proper place in the series of rocks, any portion of earthy matter we may meet with, containing any one, or even any recognizable fragment of one, of these once living beings. Just as when we find under the foundation-stone of any socient building a parcel of coins of a particular sovereign, we know that the erection of that building took place during his reign; so when we find a fragment of a known foseil in any piece of rock, we feel sure that that rock must have been formed during the period when the animal or plant of which that fossil is a part was living on the globe, and could not have been formed either before that species came into existence or after it became extinct. In cases, therefore, where the original order of the rocks has been confused by the action of disturbing forces, or where the rocks themselves are only at rare and wide interrale exposed to view, their order of deposition and consequent succession of places, may be more casily and certainly ascertained by the examination and determination of their fossil contents than by any other method." Geology may be viewed in three great aspects,—Descriptive, Theoretical, and Fractical; Descriptive Geology being that which restricts itself to a consideration of facts and appearances as presented in the profex crust. Theoretical, that which attempts to to an appearance as presented in the rocky crust; Theoretical, that which attempts to account for the phenomena, and arrange them into a connected world-history; and Practical, that which, guided in its researches by the other two, treats of the mineral products of the globe, the methods of obtaining them, and their application to industrial or economic purposes. As a main topic, geology may also be conveniently studied under the three sub-sciences,

—Physical Geography, Mineralogy, and Palaontology;

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### Geometry

the first treating of the surface configuration of the globe as depending on geological influences, the second restricting itself more particularly to a consideration restricting itself more paracticary to a consideration of the mineral substances which enter into the composition of the crust, and the third devoting itself exclusively to a consideration of the fossil plants and animals found in the rocky strats. Each of these subsciences can be studied intimately in detail as separate departments; yet it must be seen at a glance that without an intimate acquaintance with all the three, there can be no true knowledge of geology. Those who are anxious to study this grand and useful departwho are anxious to study this grand and useful department of natural science cannot choose a better guide than Mr. David Page, who has produced an "Introductory Text-book," for beginners, an "Advanced Text-book," and a "Hand-book of Geological Terms;" three works of remarkable excellence. With the light of the "Advanced Text-book," an earnest student may obtain a thorough insight into geology, and soon fit himself for studies in the field. The "Physical Geology" of Mr. J. Beete Jukes is an admirable work for those activaly exceed in examining district. teclogy of Mr. J. Beets Junes is an admirable work for those actively engaged in examining a district. For the poetry and romance of geology, the reader is referred to the interesting works of the late Dr. Mantell, particularly to his "Wonders of Geology." Sir C. Lyell's "Principles of Geology," and the excellent treatises of Phillips, De la Beche, Ansted, and Portlock, ought to be studied by the advanced student,

occ, ought to be studied by the advanced student. GEOMERRY, je-ome-orre (Gr., geometrien, formed of gea, the earth, and metreo, I measure), may be strictly defined to be the doctrine of the extension of such things as lines, surfaces, and solids. The attributes or properties of bodies may, in order to be more readily explained, be resolved into two classes, one comprising the general characteristics of all, and the other such only as are included in particular or negative bodies. the general characteristics of all, and the other such only as are included in particular or peculiar bodies. Extension, figure, magnitude, mobility, divisibility, impenetrability, weight, and inertia, may be mentioned as some of the properties which belong to the first class; whilst some of those in the second are solidity, liquidity, transparency, and such-like. Of all these properties mentioned, only extension, magnitude, figure, and divisibility, come under the special branch of science denominated Geometry; the different properties which remain, coming under the head of Natural Philosophy, or Physics. The important science of geometry was or Physics. The important science of geometry or Physics. The important science of geometry was first cultivated in Egypt, according to the testimony of Herodotus, which historism dates its origin from the following circumstance:—Sesostris, the king of Egypt, shared the lands at Thebes and Memphis between his subjects, and each portion was marked out by different landmarks; but, owing to the inundations of the Nile, these boundaries were frequently destroyed, and it became necessary, as often as this was done, to restore them by measurement; hence a swetem was and it became necessary, as often as this was done, to restore them by measurement; hence a system was invented, which was termed geometry. Thales, a philosopher who lived some 640 years before Christ, brought the science into Greece from Egypt, white, he had, it is related, gone in search of knowledge at rather a late period in life. He is said to have ap-plied a circle to the measurement of angles, and to have instituted various comparisons and relations between triangles by means of their proportions; one nave instituted various comparisons and relations between triangles, by means of their proportions; one particular point he discovered too, that all angles in a semicircle are right angles, which must be looked upon as an important discovery, when it is taken into consideration that the science was yet in its infancy. After Thales came Anaximander, who is said to have invented the state of the property and the speak and groups. geometrical charts, and the sphere and gnomen; next followed Anaximenes, who invented the sundial, and must thus have been acquainted both with astronomy and geometry. Pythagoras instituted the theory of regular solids; and under his school it was improved regular solids; and under his school it was improved gradually during the two centuries which clapsed after the introduction of geometry, until the school of Plato took it in hand. Plato seems to have had the bighest opinion of the science, and we read in the classics, that the inscription "Let no one ignorant of geometry enter here," was placed over the portals of his school. The theory of conic sections dates its birth from the Platonic achools and to the same source may be ascribed the uneary of come seemons dates its birth from the Fistonic schools, and to the same source may be secribed the beautiful theory of geometrical less, which is not only interesting from the hidden truths which it contains, but also from its importance in the solution of problems.

The school of Aristotle cannot be said to have done

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much towards the forwarding and improvement of geometry, although one of the writers of the same period has transmitted to us the only written accounts period has transmitted to us the only written a history of geometry in six books. The school of Alexandria is undoubtedly the first grand starting-point of geometry; it is justly celebrated in general history, but in mathematics its importance can hardly be over-rated. The sphool was founded shortly after the death of The sancor was founded sacrity after the death of Alexander, when the vast empire which had been built up by that conqueror was dismembered, and the greater portion of it fell to Ptolemy Lagus, who estab-lished his capital in Egypt. His wealth and encourage-ment, coupled with the disturbed state of their homes, induced many of the Greek philosophers to place themselves under his protection; and amongst these was Euclid, who is entitled to one of the highest places was mond, who is entitled to one of the nighest pieces in the history of geometry. Euclid's Elements are the foundation of the science, and all modern geometry is composed only of variations on his well-known theorems, axioms, and deductions. The writings of Archimedes are likewise most important; and although they are less studied in the present day, on account of their being less elementary than Euclid, yet they should be carefully conned by every mathematicisn, as they give a keen insight into the workings of ancient geometry -more so, in fact, than Euclid. The study of the mathematical sciences declined considerably in the 1st century of our era, but it regained its supremacy during the 2nd. Menelaus wrote on trigonometry and spherical geometry; and his work on the same reached us by means of a translation from the Arabic, which is in existence at the present day. Dr. Halley held Menein existence at the present day. Dr. Halley held Mene-lears in great esteem, and prepared a careful edition of his works, which was published in 1758. From the 2nd century up to the 8th, geometry again lan-guished considerably, and it was then taken up by the Arabians, as the Greeks had neglected it. It is from the Arabians, in fact, that some of the books of Euclid have been preserved for the benefit of science in general. The Participate has a learn against their conversions. The Persians have also possessed their geometricians, the most distinguished of whom was Nassir-Eddin al Tussi, who wrote a commentary on the great Euclid, which was published in Italy in the year 1590. The Hinduos appear to have been acquainted with some of the geoappear to have been acquained with some or ageo-metrical problems at even an earlier date than the Egyptians; but the evidence as to this is so obscure that much reliance cannot be placed on the fact. Geometry remained quiescent from the 8th century to the 17th, when it was again taken up with a similar seal as that by which it was prosecuted in the old Greek empire. Lucas Valerius, an Italian, was the first who gave it his serious consideration; and his re-searches led him beyond the timeworn pathway in first who gave it his serious consideration; and his researches led him beyond the timeworn pathway in which his predecessors had been contented to work. He selected a subject which Archimedes seemed to have forgotten; namely the centre of gravity in solida, and he carried out his purpose in a very satisfactory manner. In England, geometry, or the apirit of it, seemed now to have been imbibed; and Robert Record was the author of the first book on the subject printed in this country, entitled the "Pathway of Knowledge;" Edward Wright, another geometrician, was the inventor of the "Mercator's Chart." Kepler was the first of the moderns, however, who thoroughly understood and calarged his subject. He opened one of the unexplored pathways of science which had long been closed,—that of introducing the notion of infinity into science. The views of Kepler were eagerly adopted by Roberval and Cavalieri, and the carnest investigations of the three led to a fruitful harvest of discovery. The theory of tangents of Fermot, the differential calculus of Leibnitz, and the fluxional theory of Newton (see article on Fluxions), may be traced as consequences to the new views of Kepler. Guildin, a Jesuit, discovered the centre of gravity applicable to the measurement of solids formed by revolution; Galileo first suggested the cycloid; James Gregory was the author of the logarithmic ourve; and Leibnitz showed the two properties of the catenary. Before the time of Newton. pure security and Rephra were the only Newton, pure geometry and algebra were the only subjects on which mathematical students could exercise subjects on when mathematical students count exercise their genius; but his great and sublime discoveries opened a vast field for new studies. The fact of the orbits of the planets being in the form of ellipses,

naturally connected their motions with the theory of conic sections; and this is ably portrayed in Newton's "Frincipia." From repeated seets, the truth of this was fully established, and the theory became generally understood: whence this first step served as a ground-work of reasoning in all speculations on physics, and geometry and astronomy became even more closely allied than the ancients presumed them to be. The principles of functions and the calculus may be said to have eclipsed the geometrical method in the investigation of natural phenomena after Leibnitz invented the Differentials; and this was because of the intricacy of the latter. tials; and this was because of the intricacy of the latter, which unfits it for the more delicate calculations in the higher branches of mathematics. In concluding this brief sketch of geometry, before entering on the subject itself, it may be mentioned that Euclid is one of the best treatises which could be had on the elementary part of the subject; and after him comes Legendre's Geometry, which admits the student into the higher ranks of the science. All notions of geometrical mag-nitude are obtained by means of contemplating a body or solid, which is extended in three different forms; or solid, which is extended in three different forms; that is, in length, in breadth, and in thickness. The outside boundary of a solid which separates that particular portion of space which it occupies from space in general, is termed the surface, or superficies, that is, the external ares; and a surface cannot be considered as possessing any other qualities except length and breadth. Sometimes a surface is separated or divided into two or more parts within itself, by a boundary. This boundary is called a line, and has no divided into two or more parts within itself, by a boundary. This boundary is called a line, and has no other quality but length only. The termination of any line, which marks where it ends, or divides it into different portions, is termed a point, which possesses neither thickness, length, nor breadth. Solids, surfaces, and lines, therefore, are the subjects of geometrical investigation and discussion. There is no limit between the contract the surface and whatever to the number of these surfaces, solids, and lines which may be considered in this science. The lines which may be considered in this science. The elements of geometry, however, are restricted to a few, which include straight lines, circles, rectilineal plane figures, and their consequents, which constitute one branch of the science; and solids, bounded by planes, and the cylinder, the cone, and the sphere, all of which are formed by the intersection of planes, and which go to make up the other portion of the subject. Geometry is, consequently, divided into two branches, one of which treats of figures on a plane, the other of the formation and ramification of solids. 1st. Lines and figures on a plane.—Geometry treats on the properties and relations of quantities having or possessing the quality of extension; and such having or possessing the quality of extension; and such quantities are termed magnitudes, whilst extension is resolved into length, breadth, and thickness. A point has position, but no magnitude, and a line possesses only length: hence points and lines are closely allied; as the termination of every line, and the intersection of one line with another, must always be a point. A traight line, or right line, as it is termed in geometry, is always the shortest way from one point to another. Every line which is neither straight nor composed of straight lines, is a curve line. A superficies has only length and breadth; and, consequently, the extremities and intersections of superficies are always lines. A plane superficies is that in which any two points being taken, the right lines drawn between them lies wholly in that superficies. Every superficies which is neither having or possessing the quality of extension; and such taken, the right time drawn between them hes wholly in that superficies. Every superficies which is neither a plane, nor composed of plane superficies, is termed a curve superficies. A solid has length, breadth, and thickness; hence the boundaries of all solids are superficies, and the contiguous boundary to two solids which are connected is also a superficies. A plane rectifined angle is the inclination of two straight lines to one another which must to one superficient. angle is the inclination of two straight lines to one another, which meet at one point, but are not in the same straight line. The point of meeting between them is called the vertex of the angle. Angles, in common with other quantities, admit of addition, subtraction, multiplication, and division. When one straight line erected on another straight line makes the adjacent angles equal to one another, then each of the angles thus formed is a right angle, and has 90 degrees; the line which makes them with the base is termed the perspendicular. An obtuse angle is that which is greater than a right angle; and an acute angle is less than a right angle. Parallel straight lines, which are

in the same line, are such as, when produced, can never meet. A plane figure is a plane terminated everywhere by lines; if the lines are straight, the space they inclose is termed a rectifined figure, or polygon, and the lines themselves are termed the perimeter of the same. When this polygon has three sides (the least number it can possibly have), it is called a triangle; when four, a quadrilateral; when five, a pentagon; and so on. An equitateral triangle is hat which has three equal sides; an isosceles trangle as two sides count; and a scalese triangle has as two sides equal; and a scalene triangle has il three sides mequal. A right-angled triangle has a right angle, and the side of the triangle opposite this angle is called the hypothenuse. An obtuse-angled triangle has an obtuse angle, and an acute-angled triangle has an acute angle. Among quadrilateral triangle has an acute angle, and an acute-angea triangle has an acute angle. Among quadrilateral figures, a square is that which has its four sides all equal to one another, and all its angles right angles. A rectangle has all its angles right angles, but its oppo-site sides only are equal. A rhombus has all its sides equal, site sides only are equal. A rhombus has all its sides equal, but its angles are not right angles. A parallelogram, or rhombuid, has its opposite sides parallel and equal; and a tropezoid is a figure which has only two of its opposite sides parallel. The straight line which joins the vertices of two angles which are not adjacent to each other is called a diagonal. A polygon which has all its sides equal, is called an equilateral polygon; and it has not a real lead an equilateral polygon. its suces equal, is called an equitateral polygon; and it he angles are all equal, it is called an equiangular polygon; if both the angles and the sides of the polygon be all equal, it is called a regular polygon. With regard to the terms used in geometry, an axiom is a proposition the truth of which is evident at first sight to the observer; a theorem is a truth which has been demonstrated or reasoned; and a problem is a question proposed which requires solution; a lemma is only a subsidiary truth employed in the solution of a problem or the demonstration of a theorem; a corollary is a consequence which follows the theorems of one or several propositions or problems solved; a scholium is a remark made upon one or more preceding propositions, and it tends to show the application, the restriction, or the extension of the same; an hypothesis is a supposi-tion made in order to effect more easily the demontion made in order to enect more easily the demonstration or enunciation of a problem or theorem; and, lastly, the term proposition is applied generally to problems, theorems, and lemmas. The signs used in geometry are the same as those of sigebra. The fundamental axioms on which the science is based may be sufficiently as the side of the s indamental axioms on which the science is based may be said to be six in number. 1st. Two quantities, each of which is equal to a third, must be equal to one another.—2nd. The whole of anything is greater than a part of the same.—3rd. The whole of anything is always equal to the sum of its parts or subdivisions.—4th. Only one straight line can be drawn between any two points.—5th. Two magnitudes, whether they are lines, surfaces, or solids, are equal, if, when applied to one another, they exactly coincide, or fill the same space that is.—6th. All right angles are equal to one another. The application of these axioms, and the foundations of others, are laid down in the first and second books; whilst the proportions of the circle cocupy the third and fourth books of Euclid's Elements, and may be thus summed up:—A circle is a plane figure contained by one line, which is called a circumference; and the characteristics of the figure are such that all lines drawn from its centre, to its circumference are equal. These lines centre to its circumference are equal. These lines are called radii, or semidiameters; and the straight line which passes through the centre, and is bounded at either end by the circumference, is termed the diameter, and it divides the circle into two equal parts. An arc is any portion of the circumference of a circle which is any portion of the circumference of a circle which is separated by a chord, or straight line, which does not pass through the centre. A segment of a circle is the figure contained by an arc and its chord; if the chord passes through the centre, then the segment will be a semicircle. A sector is that part of a circle contained by an arc and two radii, drawn one to each extremity of the arc: if the radii are at right angles to one another, then the sector is said to be a quadrant. A straight time is said to be applied in a circle, when its extremities are in the circumference of the same. A reactilineal figure is inversibed in a circle, when the verrectilines figure is inscribed in a circle, when the vertices of all its angles are on the circumference. A straight line is said to be a tangent to a circle, when it

meets it in one point only; and the point of meeting is styled the point of contact. A polygon is said to be described or circumscribed about a circle, when all its circle is eaid to be incle; and in this case the circle is eaid to be increased in the polygon. The drawing of tangents and chords are the most important propositions connected with the circle, and these are fully shown by Euclid. Proportion is, however, the greatest of attributes which belong to plane figures. In comparing two quantities of the same kind, we are greatest of attributes which belong to plane figures. In comparing two quantities of the same kind, we are led, in order to have a just idea of their relative proportion, to inquire how often the less is contained in the greater magnitude. When one contains the other a certain number of times, without leaving any remainder, the greater quantity is said to be a multiple of the less, and the latter is a point of the former: equimultiples are multiples which contain similar quantities a similar number of times, and are consequently equal to one another. The relation between any finite magnitudes is termed exite. and the two macroitudes comparitudes is termed exite. and the two macroitudes comparitudes is termed exite. to one another. The relation between any name mag-nitudes is termed ratio, and the two magnitudes com-pared, are the terms of the same; the first being called the antecedent, and the second the consequent of the ratio. The terms of an equal number of ratios are called proportionals. Thus, if four quantities, A, B, C, and D, are taken, which are proportionals, A is said to be to B as C is to D; whence, A divided by B is aqual to C divided by D; and so on. The axioms with respect to proportion are three in number. 1. Equal quantity to proportion are three in number. 1. Equal quantities have the same ratio to the same quantity, and the same quantity has the same ratio te equal quantities.—
2. Quantities having the same ratio to the same quantity, or to equal quantities, are equal to one another.—
3. Ratios equal to one and the same ratio, are equal also to one another. If four quantities are said to be proportionals by inversion, it is interred that the fourth is to the third as the second is to the first. By composition, is when the sum of the first and second is to the second as the sum of the first and second is to the fourth. By alternation, when the first is to the third as the second is to the fourth. By division, when the difference of the first and second is to the second as the difference of the hird and fourth is to the second as the difference of the third and fourth is to the fourth. By conversion, when the first is to the difference of the first and second as the third is to the difference of the third and fourth; and lastly, by mixing, when the sum of the first and second is to their difference as the sum of the third and fourth is to their difference. doctrine of proportion in Euclid's fifth book applies doctrine of proportion in Euclid's fifth book applies alike to commensurable and incommensurable quantities; but for the sake of simplicity, it is generally taken in the former sense Equivalent figures are such as have equal surfaces: thus a circle may be equal to a square, and so on, although the figures are very dissimilar. The lastimaportant branch of the geometry of plane figures, is this quadrature of the circle, on which depends the discovery of the relation between the diameter and the circumference of a circle, which was said to have been known by the Chinese long before the diameter and the circumsterence of a circle, which was said to have been known by the Chinese long before the Christian era. The proportion between the circumsterence and diameter of a circle was found by contrasting the proportion between the sides of an inscribed and circumscribed polygon about a circle; it being found that the areas of these differed so little, as to give very nearly the circumference of a circle; from which it was deduced, that if the diameter equals the figure 1, the circumference will be 3:1415926, equals the figure 1, the circumference will be 3 1415226, which is near enough for all practical purposes, although, for astronomy, it is necessary to have a larger number of places of decimals. The second part of the science of geometry concerns that relating to solids. A solid has been already defined, as that which possesses length, breadth, and thickness, and in the latter characteristic, comprising its difference from a plane figure. A prism is a solid contained by plane figures, of which two opposite ones are equal, similar, and parallel, and the others are parallelograms. The distance between the bases of a prism is termed its dititude. A cube is a rectangular parallelopiped, contained by six equal squares. A pyramid is a solid contained by several planes which meet in the same point, and which terminate at the anterior extremity in a polygonal plane. An imat the anterior extremity in a polygonal plane. An important theorem in solid geometry is, that the solidity of any parallelopiped, or, in general, of any prism, is equal to the product of its base and its altitude when multiplied together. Buclid treats on the elementary

### George, St.

portions of plane and solid geometry in his sleventh book, which contains most of the propositions and theorems on the subject. The highest branch of geometry, although perhaps not the most useful to engineers, is undoubtedly that which treats of the cylinder, the line, and the sphere. A cylinder is a solid figure described by the revolution of a right-angled parallelogram about one of its sides which remains fixed. The axis of the cylinder is the fixed straight line or side about which the parallelogram revolves; and the bases are the spircles described by each extremity of the parallelogram. A cone is a solid figure described by right-angled triangle about one of the sides containing the right angle, which remains fixed. A sphere is a solid figure produced by the revolution of a semicircle about its diameter, which remains fixed. Similar cones and cylinders are such as have their axes and diameters of their bases equal or proportional. In order to estimate the curvature of any surface at a proposed point, it may be observed, the surface of a sphere cannot be assimilated with the curvature of any surface whatever; because in the sphere the curvature is uniform about the same normal, whereas in surfaces in general this is far from being the case. The say surface waterer; but the same normal, whereas in surfaces in general this is far from being the case. The mode of proceeding in such cases must, therefore, be to imagine several planes drawn through the normal at the point under consideration, in order to calculate the radii of curvature of each of those sections at that radii of curvature of each of those sections at that point, and, by comparing them, to judge of the greater and lesser curvature in those directions about the point, as well as towards what points the curvature is turned; for, curved surfaces contiguous to any point are situated partly below and partly above the tangent plane drawn to that point. In making different planes pass through the same point of a surface, so that some contain the normal to the surface and some do not it will be found that the radii of curvature. do not, it will be found that the radii of curvature relative to that point, both of the normal and oblique sections, bear remarkable relations to one another. independently of the particular form or curvature of the surface. It would be impossible in the proportions of the present work to give even the rudiments of analytical geometry of dimensions, or to deduce the various propositions, theorems, and applications of Euclid's formulas, which, did space permit, might readily be done. The reader is referred for more consistent of the proposition of the arbitrate to Tabletick to T readily be done. The reader is referred for more explicit information on the subject to Euclid's Riements, Newton's Principia, Hutton's Mathematical Tracts, Legendre's Riements de Géométrie, Hymer's Analytical Geometry, and Kopler's works, which enter at large on both divisions of geometry, both practical and theoretical. (See also separate articles on CONIC SECTIONS, ELLIPSS, FLUXIONS, GRAVITATION, &c.) GROEGE, ST., jorje, saint, the patron saint of England, was born in Epiphanis, Cilicis, or, according to some accounts, in Cappadocia; and was, during the latter years of his life, bishop of Alexandria. Some historians, however, relate that St. George was a soldier in the service of the emperor Diocletian, and that he suffered martyrdom along with many others on

# Gerhardt's Notation

world, but the greater number are found at the Cape of Good Hope. There are four genera and about 500 species, many very remarkable for the beadty of their flowers

flowers.

Grankium, je-rai'-ne-um, in Bot., the Crane's-bill, the typical gen. of the nat. ord. Geraniace. The species are chiefly European plants, in many cases being mere weeds of no interest, and in others being extremely showy border-flowers. The favourite plants called geraniums do not belong to this genus, but to the genus Pelargonium (which see). The root G. maculatum is a powerful astringent, and is much used medicinally in North America, where it is called alumnout. G. parviforum produces edible tubers, which are known in Van Diemen's Land under the name of native carrots. native carrots.

native carrots.

GERANUM OIL. (See ANDROPOSON.)

GREFILOON, or JER-FILCON, jer'-fawl-kon (Fr. gerfaut) (Fulco Gyrfulco), a species of falcon, considered as the boldest and most beautiful of the tribe. In size it approaches closely to that of the caprey. It general colour is brownish-grey, of varied tints above and white beneath, with brown longitudinal spots. The tail is crossed with a number of deeper and lighter bands, and the bill and legs are usually of a pale blue or yellowish colour. Three varieties of the ger-falcon are



GER-FALCON.

historians, however, relate that St. George was a soldier in the service of the emperor Diocletian, and that he suffered martyrdom along with many others on account of his embracing Christianity. After the crusades, the fame of St. George, who was termed by the Greeks "victorious," spread so much that, in the reign of Edward III, he became the patron sain to England. In order to enhance his popularity among the illiterate, the fabulous story of St. George and the Dragon was concoted as a reason for his canonization. Georgics, je-or-jiks (Gr. georgika, things relating to husbandry), is the title of a poem on agriculture and rural economy, by Virgil, in four books. It is regarded as the most perfect of his works, and displays an intimate knowledge of the subject.

General of the crame's-sil fam., a nat. ord. of Diocyledones, sub-class Thalamifors. Herbs or shrubs with simple leaves, membranous stipules, and articulated swollen joints. Flowers usually symmetrical; sepals five, imbricated; peats twisted in astivation; stamens generally comernate monadelphous. Fruit consisting of five carpois, stacched by means of their styles to an elongated axis or carpophore, from which they separate when ripe from below upwards by the curling up of the styles. Seeds, one in each carpel, exalbuminous; embryo convoluted. Some plants of this order are distributed over various parts of the

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# it will be seen that there is a discrepancy between the specific gravities and the equivalents of some few bodies. This will be plain from the following examples :

	Equiv. Spec. Grav.
Hydrogen	
Oxygen	8 15.9
Bulphur	
Chlorine	35.5 34.9
Bromine	90 70-8

To remove this anomaly, M. Gerhardt doubles the To remove this anomaly, M. Gernard coules the equivalent numbers of exygen, sulphur, carbon, selenium, and tellurium, on the assumption that equal volumes of elementary gases and vapours contain the same number of atoms when compared under similar consume number of atoms when compared under similar consumers. sume numer of atoms went computed unter sintar con-ditions of heat and pressure; which is equivalent to saying that an atom of oxygen weighs sixteen times as much as an atom of hydrogen, because a cubic foot of the former gas weighs sixteen times as heavy as a ou-bic foot of the latter. According to this new system, therefore, the equivalents of oxygen, carbon, sulphur, selenium, and tellurium are doubled; and in most chemical books these doubled equivalents are indicated by a line drawn through the letter; thus—eeg p. 5. A few compounds, formulated according to both systems, are given below; but, for convenience, the new equivalents are printed in italies:—

•	Old Formulæ.	New Formulæ.
Water Potash Oxide of silver Alumins Sesquioxide of iron Chloride of potassium Sesquichioride of alumina Hydrochlorio acid Bulphide of potassium Cyanogen Cyanogen Carbonic oxide	HO KO AgO Al.O. Fe.O. KCI Al.CI. HCI KS O.N CO	H.O Ag.O Al.O. Fe.O. KCl Al.Cl. H.Cl. H.Cl. CN CO

Besides the change in the equivalents described above, Gerhardt revived and fully carried out a theory of the constitution of acids and salts, first propounded by Sir Humphrey Davy. According to the present theory, as first started by Lavoisier, Berzelius, and others, nitrate of silver would be formulated thus:—AgO, NO.; being looked on as a compound of nitric acid and oxide of ailver; but, on comparing this salt with its corresponding haloid, chloride of silver, a disorepancy occurs, which vanishes, if we consider nitric acid, as existing in nitrate of silver, to consist of NO, instead of NO. From numerous other accounts. existing in nitrate of silver, to consist of NO<sub>a</sub> instead of NO<sub>a</sub>. From numerous other anomalies, occurring chiefly in organic bodies, Gerhardt came to the following conclusions:—1. That every uncombined soid necessarily contained one of more equivalents of hydrogen.—2. That the bodies hitherto regarded as dry soids possessed no acid properties until united with hydrogen and oxygen.—3. That salts were formed by the substitution of one or more atoms of hydrogen. by the substitution of one or more atoms of hydrogen, by one or more stoms of a metal, or some substance acting as such. Thus, the bodies known as NO<sub>2</sub>, SO<sub>3</sub>, and CO<sub>3</sub>, are neutral and inert, until united with an equivalent of water, when they form respectively nitrie, sulphurio, and carbonic acids.

	Old view.	New view.
Nitric scid	NO.	HNO.
Bulphuric acid	80,	HSO.
Carbonic acid	co.	HCO.

This brings the haloid and oxygoid salts into perfect harmony, both being regarded as acids in which the hydrogen is replaced by a metal.

$$HCl + K = KCl + H$$
  
 $HSO_4 + K = KSO_4 + H$ 

or, in other words, the sold is regarded as the nitrate sulphate, or carbonate of hydrogen, and the sait formed, as the nitrate, sulphate, or carbonate of the metal. Hence the terms nitrate of potassium, sulphate of sodium, and carbonate of ammonium, as used by Gerhardt's followers, instead of those in ordinary use.

### German Catholics

German Catholics

Gerhardt also originated the system of arranging compounds according to types, and sully worked out the theory of the formation of all bodies by the substitution of one element or group of elements by others of a similar character. (See Salzs, Substitution Tenony, Types,—Ref. Fowne's Manual of Chemistry, 8th edition, Appendix; Odling's Messual of Chemistry.

German Catholics, jer's make kith-o-liks, is the name of a religious sect which has recently been formed in Germany, by secession from the Roman Catholic church. It originated in a proclamation of a special pilgrimage and service by Bishop Arnoldi, of Treves, to the holy coat of that city, to be accompanied by remission of sins. This proceeding called forth a letter from Johannes Ronge, an excommunicated priest of Silesia, dated 1st Ootober, 1844, characterising it as an idolatrous festival, and calling upon the bishop to suppress it. A short time before, another Catholic priest, Johann Czerski, had seceded from the Romish church, and attempted the foundation of an independent Christian congregation. The letter of Ronge met with many sympathizers, and czerski, a number of congregations sprang up in a very short time. calling themselves German Catholics. The having been effected between konge and Czerski, a number of congregations sprang up in a very short time, calling themselves German Catholics. The "Confession of Schneidemühl," drawn up by Czerski, Oct. 19, and presented to the government Oct. 27, 1844, rejected as unscriptural, and as merely human ordinances, the reception by the priests alone of the Lord's supper in both kinds; the canonization and invocation of the saints; indulgences and purgatory; fasting; the use of the Latin language in divine service; mass and vespers; the ceilibacy of the priests; the prohibition of mixed marriages; the supremsey of the pope, and other points. They declared themselves determined to sever their connection with the pope, to receive the Lord's supper in both kinds, and to recognize the Bible as the only rule of faith. They retained the seven sacraments and the mass, which they celebrated in the vernacular tongue. The "Confession of Breslan," which set forth the views of retained the seven sacraments and the mass, which they celebrated in the vernacular tongue. The "Confession of Brealau," which set forth the views of Bonge, proceeded farther than that of Schneidemühl,—claiming free investigation of the Bible, and freedom of belief for every individual member. It regarded as essential doctrines only,—belief in God, the creator and governor of the world; in Jesus Christ, as having, by his doctrine, his life and death, redeemed men from sin and misery; and in the influence of the Holy Spirit upon earth. Of the sacraments of the Catholic church, it retained only baptism and the Lord's supper. A council met at Leipsic on the 22nd of March, 18-25, in which Ronge, Czerski, and the delegates of twenty congregations, took part; and a new creed was adopted, based principally upon the Confession of Breslau. After that time the principles of German Catholicism spread very rapidly, being of German Catholicism spread very rapidly, being adopted not only by many Roman Catholic priests, but adopted not only by many Roman Catholic priests, but also by many Protestant clergymen and laymen. At the end of 1845, they comprised about 300 congregations. They, however, met with much opposition from the various governments, and many vexatious restrictions were imposed upon them in Prussis, Saxony, Bavaria, and other states. A more serious source of disquiet, however, arose among themselves. It has been seen that the tendency of Czerski was towards the doctrines and ritual of the Church of Rome; Ronge, on the other hand, approached towards rationalism. A series of dissensions, in this way, arose among the body, which was very prejudicial to their progress. An attempt was made to unite both parties in an assembly at Bawicz, in the month of February, 1846, in which Czerski, Ronge, and others took part; but it had not the desired effect. The congregations sympathizing with Czerski met at Schneidemühl in the month of July in the same year, in order to effect a closer organisation among them, in order to effect a closer organisation among them selves; but, from the great differences of opinion that prevailed among them, they were unable to come to any agreement. Nor were the followers of Ronge more successful in their attempts to effect the same object. A council was held at Berlin, in May, 1847, attended by deputies from 151 congregations, and new efforts were made to accomplish a union of the two parties, but with little better success. The revolution of 1848 was favourable to the German Catholics,

and generally led to the removal of some of the civil restrictions to which they were subjected. A conference was held at Kothen in 1850, at which an alliance was proposed with the free congregations which had formed themselves by secession from the Protestant churches; and a diet was fixed for 1852; but it did not meet. Since that time German Cathotrocerent controller; and a une was ment to 1992; but it did not meet. Since that time German Catholicism has been on the decline, partly on ascount of internal dissensions, and partly from oppressive measures adopted against them by the governments. Many congregations have been disbanded, while others have gone over in a body to the Protestant church.

A conference was held at Gotha, Sept. 10, 1858, at which, however, only forty-two representatives were

Present.
GERMAN LANGUAGE AND LITERATURE (Ger. Deutsche Sprache und Literatur).—The German language is a branch of the Indo-Germanic class of languages, which separated from the parent stock at a very early period. The Germans called their language Deutsch or Teutsch, The Germans called their language Deuteck or Teuten, from their aucestors, the Teutons. In its widest sense the Teutonic consists of two branches,—the Northern, or Scaudinaviau, and the Southern, or German. The latter has three subdivisions,—the Rastern, or Gothic, the High German, and the Low German. The Gothic is the carliest of these of which we possess any literary remains, there being still in existence portions of a translation of the Bible into Gothic made by Bishop Italia is the 4th cantury, but we possess puthing of Ulfiles in the 4th century; but we possess nothing of the High or Low German till the 7th century. Hence many persons have been led to regard the Gothic as the original source of the German; but, according to Max Müller, the grammatical differences between the max Muller, the grammatical differences between the two are of such a nature as to show that this was impossible. "There never was," he says, "a combron uniform Teutonic language, nor is there any evidence to show that there existed at any time a uniform High German or Low German language, from which all High German and Low German dialects are respectively derived." The Gothic language died out in the 9th century. The Low German (Platt Deutsch) comprehends many dislects in the north or lowlands of German Country and Plantic Street Country and Pl many, as well as the Friesian, Dutch, and Flemish dis-lects. The oldest literary document of Low German on the continent is the Christian epic the "Heljand" off the officer of Saviour), which is preserved to us in two MSS.
of the 9th century. There are traces of a certain amount
of literature in Saxon or Low German from that time onward, through the middle ages, up to the 17th cen-tury, but little of that literature has been preserved; tury, but little of that literature has been preserved; and after the translation of the Bible by Luther into High German, the fate of Low German literature was sealed. High German (Hoch Deutsch) has been the literary language of Germany ever since the days of Charlemagne. Its history may be traced through three periods,—the Old High German, extending from the 7th to the 12th century; the Middle High German, from the 12th century to the time of Luther; and the New High German, from Luther down to the present time. In the present day there are various dialects of the German spoken in different parts of the present time. In the present day there are various dislects of the German spoken in different parts of the country; as the Swabian, Bavarian, Franconian, Saxon, &c., (See Müller's Lectures on the Science of Language.) The earliest existing monument of German literature is the translation of the Bible into Gothic by Ulflas, is the translation of the Bible into Gothie by Ulfilas, already alluded to. After the Gothie language ceased to be spoken, nothing was known of this work until towards the close of the 16th century, when a portion of it,—namely the four Gospels, was found in the abbey of Werden. The letters are in silver upon purple veilim; whence it is called the Codex Argentess, and it is now preserved in the library of Upsala. Afterwards, in 1616, the Epistles of St. Paul, of the same work, were discovered by Cardinal Mai and Count Castiglioni in the monastery of Bobbio, in Lombardy Of the translation of the Old Testament only a few lines remain. The earliest literature of Germany is known to us only by report or tradition. According lines remain. The earliest literature of Germany is known to us only by report or tradition. According to Tacitus, the Germans celebrated in songs, which were old even in his time, the praises of their national deity Tuisco, and his son Mannus, as well as the deeds of their great heroes. When the nations began to migrate, heroes of greater and greater remown march into the scene of song, and the historic forms of Attile, Theodoric, Günther, and others, appear. The two

most ancient German poems are the "Lay of Hildebrand and Hadabrand" and the Prayer of Weissenbrun, which belong to the 6th century. Many of the legends of this period were afterwards embodied in the lay of the "Nibelungen," the most celebrated production of German mediawal poetry. The introduction of Christianity exercised an important change in the early literature of Germany. The Latin language early literature of Germany. The Latin language came to be that of the church, the court, and the law. came to be that of the charten, the court, and the law.

A kind of religious poetry, after the model of the Roman poets, was introduced in place of the ancient heroic and mythical songs, and was fostered by the court as well as by the clergy. Charlemagne, indeed, was fondly attached to the ancient lays of his fatherland, was londly actsoned to the another to be made; but his successor, Lewis the Pious, looked upon everything German as heathenish: and the consequence was, the almost total destruction of every poem which bore a special mythological character. The "Heljand," a special mythological character. The "Heljand," a poem giving the life of Christ, was written at the in-stance of Lewis the Pious in the 9th century, and stance of Lewis the Pious in the 9th century, and is one of the noblest productions of poetic genus that has ever appeared. Thirty years later appeared another sacred poem, known as the "Krist," composed by Otfried, a Benedictine monk of Weissenburg. Another poem of this period is the so-called "Ludwigs-lika". lied," a poem in honour of the victory of the Frankish king, Lewis III., over the Normans in 883. The other poetical remains of this period are chiefly of a religious poetical remains of this period are cheen of a religious nature, and, together with the contemporary prose literature, are not worthy of notice. Germany, by losing its French and Italian provinces, had become Germany again; and a desire to cultivate the national literature again began to manifest itself. The monks of St. Gall, Passau, and other places, translated some of the German epics into Latin verse; such as the poem of the "Nibelungen," of "Walther of Aquitaine," and of "Ruodlieb," the last two of which have been pre-served and published. The stories of the for, the bear, sad other animals, so peculiar to German poetry, attracted the attention of the monks; and it is owing to their Latin translations that this curious style of poetry can Latin translations that this curious style of poetry can the 10th century. The 11th be traced back so far as the 10th century. The 11th century presents almost an entire blank in the history of German literature. The old High German had become a literary language chiefly through the efforts of the clergy, and its character was pre-eminently clerical. The Crusades, however, put an end to the clerical element in the literature of Germany. The chivalrous emperors of the Hohenstaufen dynasty formed a new emperors of the Hobenstauten dynasty formed a new rallying-point for all national sympathies; and the interest of the people was with the knight, not with the priest. Poetry changed hands, and the royal courts and knightly eastles offered a new and more genial home to the poets of Germany than the monas-teries of St. Gall and Fulds. Middle High German, teries of St. eat and Finis. Infinish High expensions the language of the Swabian court, became the larguage of poetry, and the poets took their inspiration from real life, though they borrowed their models from the romantic cycles of Brittany and Provence. The stories of Arthur and his Knights, of Charlemagne, of Achilles, Eness, and Alexander, imported by French and Provenous knights, served them as their first and Provences Enights, served them as their area models; and while foreign influence is seen in every branch of German poetry at this time, yet nothing can be more different than the same subject, as treated by French and German poets. The German Minnesanger, in particular, were far from being imitators of the Trouvères or Troubadours. Poets made bold for the strict time to express their own feelings, their joys, and sufferings, and epic poetry had to share its honours with lyric songs. The poetry which flourished at the castles was soon adopted by the lower ranks, and the poems of the "Nilcolungen" and "Gudrun," as we now had been added to the time had been added to the possess them, were composed at that time by posts who possess them, were composed at that time by posts who took their subjects, their best thoughts and expressions, from the people; but imitsted the language, the metre, and the manners of the court poets. Thus there are two kinds of poetry of this period,—the national, or people's poetry, the production of strolling materies; and the art poetry, or that of the courts, composed chiefly by kings and courtiers. Many of the poets were nobles by birth, several of them prinoes. Among the distinguished poets of this period, are Heinrich von Veldecke, Hartmann von Aue, Wolfram

von Eschenbach, Gottfried von Straaburg, and Kon-rad von Würzburg. The fall of the Swabian dynasty of the house of Hohenstaufen, in the latter half of the 13th century, was the death-blow to German chivalric poetry. Lysic poetry continued to flourish for a time; but it degenerated into an affected sentimentality and anworthy idolatry of the ladies. Didactic poetry, how-ever, began to be cultivated with some degree of success. The middle classes, the burghers of the free towns of degrees were new heripping to rise into power of Germany, were now beginning to rise into power, and poetry again changed hands. It now passed from the abodes of princes and knights to the homes of burghers and the workshops of artisans; and instead of the Minnesinger, we have the Meistersinger, and their strains were more subdued, practical, and homely. Poetry became a trade, like any other, and guilds were Foetry became a trade, like any other, and guilds were formed, consisting of master-singers and their apprentices. Heinrich Frauenlob is called the first Meistersänger, and during the 14th, 15th, and 16th centuries, new guilds or schools were formed in all the principal towns of Germany. The poetry of the 14th and 15th centuries is interesting historically, but is not otherwise of much value. The best songs of the period are those of Halbauter and Veif Weber, celebrating the victories of Switzerland over Austria and are those of Halbauter and Veit Weber, celebrating the victories of Switzerland over Austria and Burgundy. Attempts were made to revive the chivalric poetry of the Crusades, both in the beginning and towards the close of the 15th century, but without success. In the 13th century, prose literature begins to flourish, and several local chronicles appear,—as well as works on jurisprudence, and some sermons. In the 14th century, Germany possessed several mystic theologians, as Eckart and Tauler, men of clear intellect and energy of purpose, whose sermons and writings contributed to pave the way for the Reformation. In 1373, the first complete translation of the Bible into German was made by Matthias of Beheim. An important event in this century, in its general influence upon the future progress of German literature, was the establishment of the university of Prague, followed soon after by universities in almost all parts of Germany. The 15th century was rich in scholars, but poor in men of genius or strong thinkers. The invention of the art of printing was a reformation in this century, the hence the of which were abited. genius or strong thinkers. The invention of the art of printing was a reformation in this century, the benefits of which were chiefly felt by the great masses of the people. It extended to them the privileges which had previously been confined to the rich. Between 1470 and 1500, several thousand editions of books were printed in Germany. The 16th century introduces, along with the Reformation, a new era in the history of the literature of Germany. Luther's translation of the Bible is so pure in language, and so beautiful in style, that it is still regarded, even in the present day, as a model of elegant expression. The present day, as a model of elegant expression. The religious quarrels which agitated Germany during the religious quarrels which agitated Germany during the 16th century gave to literature a theological direction, and the first scholars of that time were more or less engaged in religious controversy. Prominent in this class, after Luther himself, ratuad Zwingli, Johann Arnd, Bugenhagen, Bullinger, Melanchthon, and Ulrich von Hutten. Some of the best poets of this period, as Boban Hessius, composed their poetry in Latin; and, indeed, there came out from the universities a tendency to exalt the Latin above their mother tongue, which was very prejudicial to the latter. The period before and after the Reformation was especially furtiful in satirical and allegorical works. One of the tongue, which was very preparation was especially period before and after the Reformation was especially fruitful in satirical and allegorical works. One of the most remarkable of the former class was the "Ship of Fools" (Narrenschiff), by Schastian Brant, a metrical satire on the follies of the age; and which was afterwards imitated by Thomas Murner, in his "Narrenswards in the Murner was Johann Fischart, the author of numerous works; among which may be mentioned "Flohatz," a remarkably witty poem on fleas; and a romantic poem, "Das ably witty poem on fleas; and a romantic poem, "Das ably witty poem on fleas; and a romantic poem, "Das ably with the German among which may be mentioned "Flohatz," a remarkably witty poem on fleas; and a romantic poem, "Das glückhafte Schiff." He has been called the German Rabelais. Of the popular songs (Volkshieder) of this period, some have been much admired. The works of Hans Sacha, the poet and cobbler of Nuremberg, display a very remarkable degree of fertility, liveliness, and humour. A great poet, in the strict sense of the word, he was not; but he possessed an uncommon talent for mastering any given subject, and he was the

most popular poet in Germany during that century. His works are numerous, and in all apples of composi-tion, from the most tragic touch of feeling to the most popular poet in Germany during that century. His works are numerous, and in all tytes of composition, from the most tragic touch of feeling to the most comic turn of thought. This period produced several distinguished scholars and men of science; among whom may be mentioned Melanohthon, Camerarius (classics and philology), Cornelius Agrippa, Theophrastus Paracelaus (mystical philosophy and natural history), Copernicus (astronomy), Leonhard Fuchs (botany and medicine), Corrad Gesner (botany and zoology), and Agricola (mineralogy). Towards the en of the 16th century, everything seemeddrifting back into the middle ages; and then came the Thirty Years war, which, in its consequences, was most disastrous to Germany. The physical and moral vigour of the nation was broken. We meet with no trace f originality, truth, taste, or fealing in the poetry of that period, except, indeed, lin the sacred poetry, many of the hymns of Paul Gerhard being still sung in the Protestant churches of Germany. As auterly opposed to nationality or originality. Opitz, the founder of the so-called Sileaian school, is the true representative of the classical poetry of the 17th century. He was a scholar and a gentleman, most correct in his language and versification, never venturing on ground which had not been trodden before by some classic poet, whether of Greece, Rome, France, Holland, or Italy. Literary societies were formed at several of the courts of Germany, professedly for the improvement of the language and poetry of the country, after the model of those of Italy; but they were mere silly imitations, and produced little good. The "First Silesian school" is represented by men like Opitz and Weckherlin, and is characterized as pseudo-classical. It was imitated in the north of Germany by Simon Dach, Paul Flemming, and a number of less-gitted poets, who form the "Königaberg school." The chief heroes of the "Second Silesian school" is represented by men like Opitz and Weckherlin, and is characterized as pseudo-classical. It was imitat and a number of Isss-gitted poets, who form the 
"Königsberg school." The chief heroes of the 
"Second Silesian school." The chief heroes of the 
"Second Silesian school." The Hoffmannwaldau and 
Lohenstein, whose compositions are more ambitious, 
bombastic, and full of metaphors than those of Opitz; 
but are also more disappointing. There were some 
independent poets who kept aloof from either of these 
schools, as Friedrich von Logan, Andreas Gryphins, 
and Moscherosch. Among the other works of this 
period, we may mention the "Simplicissimus," a novel 
giving a lively picture of German life during the 
Thirty Years war; the patrictio writings of Professor 
Schupp; the historical works of Paffendorf; the 
pietistic sermons of Spener and of Franke, the founder 
of the orphan school at Halle; Professor Arnold's 
ecclesias ical history; the first political pamphlets of 
Professor Thomasius; and among philosophers, Jacob 
Boehme at the beginning and Leibnitz at the end of the 
entury. The 18th century was marked by a revolution 
in the literature and modes of thought in Germany. 
Johann Christoph Gotteched, professor of eloquence at 
Leipsic, in the early part of this century, exercised great 
power as a critic, and was the means of defeating the 
Second Silesian school. He was, however, an advocate 
of French models in art and poetry; and it was 
through the opposition which he roused by his Gallomains, t at German poetry was at last delivered from 
the trammels of that foreign school. Gottsched and 
his friends at Leipsic were opposed by Bodmer and 
his friends at Leipsic were opposed by Bodmer and 
his friends at Leipsic were opposed by Bodmer and 
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his friends at Leipsic were opposed by Bodmer and 
his friends at Leipsic were opposed by Bodmer and 
his frien named, we're Hagedorn of Hamburg, whose fables and songs have immortalized him in Germany; and Albert von Haller, the physiologist, remarkable also as a writer of descriptive and didactic poetry. During this literary stringgle, the great names of German poetry sprang up, — Klopstock, Wieland, Lessing, Herder, Goethe, and Schiller. Klopstock's "Messiah" made a profound impression by its mystic, devout, and rapturous faith, as well as a work of art. The fashionable

and elegant portion of society was attracted by the semi-Grecian, semi-Parisian muse of Wieland. But it was reserved for Lessing to give a new direction to German literature. He established a new school of criticism, and exerted a powerful influence upon the progress of the drama, by unfolding, for the first time, to the German mind, all the beauty, originality, and vigour lof Shakespeare. His tragedy "Emilia Galotti," his comedy "Minna von Barnhelm," and his philosophical drama "Nathan der Weise," are models of dramatic composition. Herder, a man of vast learning as well as a noetic genius, exerted a strong influence instic composition. Herder, a man of vast learning as well as a poetic genius, exerted a strong influence upon the poets of his time, and contributed powerfully to promote the study of Oriental poetry, as well as the ancient popular songs of different nations. The crowning work of his life is his "Ideen zur Philosophie der Geschichte der Menachheit." Another great impulse was given by Winekelmann, whose writings on the remains of ancient art modified all the old theories of the beautiful. Goethe came forward in 1773 with his "Goetz von Berlichingen," which was greeted as the commencement of an entirely new 1773 with his "Goetz von Berlichingen," which was greeted as the commencement of an entirely new period in German dramatic literature. In 1781 appeared Schiller's first piece, "Die Räuber" (the Robbers), followed by "Fiesec" and "Cabale and Liebe." These impassioned tragedies gave a new impulse to the literary excitement. His "Don Carlos" (1784) shows greater moderation, and opens a long series of tragedies, in which the highest aspirations for liberty and humanity are sinterwoven with historical associations expressed in language of the most classic purity. It was now however, after Schiller's muon with It was only, however, after Schiller's union with Goethe (1795) that, by their combined labours, Ger-man literature was brought to that classic perfection Goethe (1796) that, by their combined labours, German literature was brought to that classic perfection which, from a purely local, has since given to it a universal influence. Schiller, by his enthusiastic and sympathetic eloquence and tenderness, became the favourite of the people; while Goethe, with his many-sided intellect and boundless sensibilities, controlled by a strong will, became the acknowledged sovereign of German literature. The philosophic spirit of this age also gave birth in rapid succession to the master minds of Kant, Fichte, Hegel, and Schelling. Jean Paul Richter is a peculiar and powerful writer of this period, whose works, though characterized by obscurity and irregularity, are frequently lighted up by flashes of humour and brilliant gems of thought and feeling. Novalis (von Hardenberg) is another strangely-constituted writer, whose works, though few and fragmentary, contain scattered thoughts of such wisdom and genius as to give them a high place in the hiterature of his country. Ludwig Tieck, a more voluminous and connected writer than his friend Novalis, was also much more of a creative genius. His dramas, and and connected writer than his friend Novalis, was also much more of a creative genius. His dramas, and collection of ancient fairy and popular tales, often reflect the romance of medieval possay with much beauty and genius, but with a mystic feeling, bordering almost on superstition. To the so-called Romantic school belong the brothers Schlegal,—August Wilhelm, author of various critical and asthetical works, and a metrical translation of Shakespeare; and Friedrich, known as a writer on the history of ancient and modern literature, and the philosophy of history. The other writers translation of Shakespeare; and Friedrich, known as a writer on the history of ancient and modern literature, and the philosophy of history. The other writers of that and the subsequent period to the present time, are so numerous, that we can only afford to mention a very few of them. In almost every department of literature, the writers of the present or last century, in Germany, occupy a chief place. In philosophy, the names are numerous; but they are all eclipsed by the great names of Kant, Fichte, Schelling, and Hegel, and generally belong to one or other of these schools. (See German Philosophy.) In theology, Schleiermacher, Paulus, Bretachneider, Reinhard, Eichhorn, Hengstenberg, and a host of others, have done good service in the field of biblical inquiry. In philological and critical inquiries, occur the names of Wolf, Hermann, Boeckh, Othried Müller, W. von Humboldt, the brothers Grimm, Ffanz, Bopp, Bunsen, Benecke, Lachmann, Haupt. In history, Johannes von Müller, Heeren, Wachler, Friedrich von Raumer, Ranke, Lappenberg, Pertz, Niebuhr, Neander, Dahlmann, Gervinus, Menzel, Schlosser. In poetry, besides the names already mentioned, are Arndt, Körner, Heine, Uhland, Kinkel, Riokert, Schwab, Kerner, Mörike, Börne. In dramatic literature, are distinguished Kotzebue, Müllner,

Houwald, Grillparzer, Eaupach, Grabbe, Immermann, Gutskow, Mosen, Prutz, Laube, Helbel, and Frydag. In the field of historical or social romance, are Witziben, Van de Velde, Pichler, Häring, Spindler, Steffens, Koenig, Gutskow, Prutz, Mugge, Von Sternberg; ben, Van de Velde, Pichier, Häring, Bunnier, susuems, Koenig, Gutzkow, Pruts, Mugge, Von Sternberg; besides several ladies; as Ida von Hahn-Hahn; Paalsow. Among other literary writers of note, may be mentioned F. de la Motte Found, Achim von Arnim, Brentaus, Von Kleist, Amadeus Hoffmann, Chamisso, Kühne, Anerbach, and Stifter. The labours of A. von Humboldt in the field of natural science have given a powerful impulse to the German mind in that direction. Among their travellers are Martins in Brasil, Pöppig Humboldt in the field of natural soience have given a powerful impulse to the German mind in that direction. Among their travellers, are Martius in Brasil, Pöppig in South America, Tachudi in Peru, Schuehert in Greece, Lepsius and Brugsch in Egypt, Schomburgk in British Guiana, Biebold in Japan, Gützlaff in China, Barth and Vogel in Africa, the brothers Schlagentweit in Central Asia, and Leichhardt in Australia. On geography, ethnology, &c., are the works of Berghaus, Petermann, Stein, Hübner, Wappäus, Klöden, Kohl. In astronomy and mathematics, are Bessel, Hnoke, Struve, Gauss, Mädler; while in medicine and the natural sciences, are J. Müller, Ehreiberg, Burdach, Carus, Oken, Cotta, Schleiden, Von Buch, Liebig, Dove, Burmeister, Poggendorf, Erdmann, Gmelin, Gräfe, Vogt, Rokitansky, Wagner, and Doffenbach. In the history of language and literature, politics, and the social sciences, are Vilmar, Gervinus, Bouterwek, Becker, Wachler, Waagen, Savigny, &c.—Ref. Max Müller's Collection of the German Classics, Introduction; History of German Literature, by W. Metcalf, Koberstein's Grundeis der deutschen Nationalliteratur (1845-52); Gervinus' Geschichte der deutschen Nationalliteratur (1845-52); Gervinus' Geschichte der deutschen Nationalliteratur (1852) y Jul. Schmidt's Geschichte der deutschen Nationalliteratur (1852); Jul. Schmidt's Geschichte der deutschen Nationalliteratur (1852); Geschichte der deutschen Nationalliteratur (1852); Geschichte der deutschen Nationalliteratur (1852); Geschichte der deutschen Pienies philosophic spirit which characterizes Germany in the present day is only of comparatively modern origin. The old scholastic forms retained their place here long after they had been forsaken in France and England. The writings of Lord Bacch, of Descartes, and of Spinoza, which

been forsaken in France and England. The writings of Lord Bacon, of Descartes, and of Spinoza, which did so much for philosophy in their own countries, had but little influence in Germany. It was more particu-larly the writings of Locke which first excited any considerable degree of attention. His empiricism, considerable degree of attention. his empiricism, which sought to set up psychology as a regulator of metaphysics, aroused the opposition of Leibnitz, the first German that made an epoch in the history of the new philosophy, and who, from the influence which he exerted on all sides, must be regarded as the originator exerted on an sides, must be regarded as the originator of the philosophic spirit in Germany. Yet the fundamentals of his system,—monodology, pre-established harmony, the doctrine of innate ideas, wanted a strong systematic basis, being rather genial hypotheses than regularly-established propositions. This defect Ohr. Wolf set himself to remedy, and sought to establish a system of philosophy complete in all its nate. Wolf set himself to remedy, and sought to establish a system of philosophy complete in all its parts, according to the fules of strict logic; but, in so doing, he set aside the very doctrines which most particularly obsaracterize the system of Leibnitz. The wide circulation of his writings, the high esteem in which he was held by his contemporaries, the great number of his scholars and adherents, show the great influence which Wolf exerted for a time, He was destined, however, to outlive his reputation, for there soon came on a period of philosophical deadness in Germany. during period of philosophical deadness in Germany, during which a kind of eclecticism, devoid of principle, prewhich a kind of eclecticism, devoid of principle, prevailed,—the so-called "philosophy of common sene," borrowed from the English and French philosophers of the 18th century. Nevertheless, there also existed great mental activity of certain kinds. Poetry, the reform of education, politics, and religious enlightenment, deeply occupied men's minds; old eustoms in family and political life ware shaken, and a great and thorough movement was preparing itself in the quiet. With Immanuel Kant begins the more modera period of German philosophy; and although, at first, his with immanuel Kant begins the more modera period of German philosophy; and although, at first, his "Critique of Pure Reason" (Kritic der reinet Verwarft) was in danger of being everlooked; yet, after a time, this and the principal of his other critical works, which, after long preparation, made their appearance in rapid succession, gave a powerful stimulus to

scientific research. The cause of this lay, not only in the novelty and comprehensiveness of his investigations, but in that they exactly corresponded with the tenthe movelty and comprehensiveness of his investigations, but in that they exactly corresponded with the tendencies of the age-at the time. Excluding all dogmatism and fanaticism, maintaining the independence of apeculative inquiry, referring all theoretical apeculation to the accessible region of experience, the elevation of the mozal to the highest and ultimate of all human endeavour; these in general constitute the main features of his philosophy, which he wisked to be cultivated rather with a view to its social than to its mere philosophic importance. He also entertained the hope that, by means of critical investigations into the nature of the human mind, it might be possible to reconcile the opposing systems of empiricism and rationalism, of sensualism and spiritualism, &c., and to discover a series of comprehensive principles to which the convoversies of the philosophic schools might be referred in the last instance. That this hope was disappointed was owing to this, that Kant sought to support the old metaphysic of the schools by a psychology which itself rested on the basis of that metaphysic. Besides, there was wanting in the heyday of Kantism any sufficient point of unity for the several parts of philosophy. Of this want K. L. Reinhold was the first to become conscious; and scepticism, as in Schulze's Anexidenus, and degree that the contract and others. scious; and scepticism, as in Schulze's Anesidemus, and dogmatism, in the writings of Eberhard and others, dogmatism, in the writings of Eberhard and others, raised their feeble opposition to the now triumphant criticism. J. G. Fichte believed that he had found that absolute point of unity which the criticism of Kant had indicated, in the fact of consciousness. Fichter verweling on the path which Kant had pointed out, changed the half-idealism of Kant into a complete idealism, while he declared the Ego to be, not only the bearer and source of knowledge, but also the only reality, the representation and act of which is the world. In the Ego, knowing and being were identical; it was at once the principle of existence, and knowledge and nature appeared only as the reflex of its absolute activity. With this idealism began akind of revolutionary excitement among the philosophic minds of Germany, which contrasted strongly with the quiet and sober spirit of Kant. System followed system, philosophic literature became overwhelming, and the public excitement was general for twenty or thirty years. The ment was general for twenty or thirty years. The meteors which made their appearance in the philosophic heavens of Germany, for the most part disappeared as suddenly as they had blazed forth. Schelling was the first to exert a more general influence, and changed the idealism of Fiohte, under the influence of Spinoza (who had been again brought into notice by Jacobi), into the so-called philosophy of identity. This system set out originally with the assertion that, as Fiohte has deduced nature from the Ego, so, by reversing the process, the Ego may be deduced from nature; that both forms of philosophy find their basis in the absolute, as the identity of all opposites,—the ideal and real, subject and object, spirit and matter. In order to carry out this assertion, Schelling assigned intellectual intuition as alone corresponding to the absolute; yea as representing, and identical with, the absolute itself. The organ of this intuition was called reason, and, as such, was opposed to the reflection of the understanding, which was held to be quite incapable of comprehending absolute identity. The relation of the actual phenomenal world to the absolute was held to consist in this, that the latter represents itself in a the first to exert a more general influence, and changed comprehending absolute inemuty. The remain of one about phenomenal world to the absolute was held to consist in this, that the latter represents itself in a multiplicity of appearances, steps out of "indifference" into difference, manifeste itself in the latter, &c. He sought to demonstrate this identity in non-identity, and non-identity in identity,—especially with regard to natural philosophy in special cases, in which the highest merit to which he and his followers are entitled is the having opposed the empiricism of mere observation and computation in natural investigations, and to have contributed to the swakened interest in and to have contributed to the awakened interest in the natural sciences. For in contemuing experience and reflection, occasion was also afforded to a fanciful

the direction indicated by Fichts and Schelling, the philosophy of Hegel also asserted itself, and attempted to develop in regular succession the equature of the intellectual intuition by the dialectic method. He indeed threw off the lawless play of fanciful combinations; but he sought for the expression of speculative thought, not in those laws of the comection of thought thought, not in those laws of the consection of thought which have been recognized for thousands of years, but in a dislectic, the essence of which consists in the analysis of all the established principles of thought, and whose process consists therein that every conception generates out of itself its opposite, and uniting this with itself, inwardly enriches itself, and in this way proceeds to still higher stages. This method pretended to be identical with the thing itself; Hegel, with analysing preservations cought to carry out. tended to us defined with the thing testing a security with lenduring perseverance, sought to carry out through the whole field of philosophic inquiry, and divided his system into the three provinces of legic, the philosophy of nature, and the philosophy of mind. While the systems above-mentioned form a tolerably statishing the company of the philosophy of the philosoph While the systems above-mentioned form a tolerably straight line of progress, there excess certain other systems, as that of J. F. Herbart, in opposition to the idealism of Fichte, and which took a direction quite contrary to the philosophy of the time. Herbart, Schelling, and Hegel are the only thinkers that can claim to have exerted any general influence since the time of Kant. Among the numerous other thinkers of this time, who were chiefly occupied in defending or remodelling the older systems, we may mention Krug, Fries, and others, who were employed in the development of the Kantian system; Steffens, Oken, Schubert, F. von Baader, and Eschenmayer, who were employed chiefly in physical researches; those who Schubert, F. von Baader, and Eschemayer, who were employed chiefly in physical researches; those who attempted to exhibit systematically the philosophy of Jacobi; the different attempts to bring back philosophy to an empirical psychology; the peculiar specularive attempts of Schleiermacher, J. J. Wagner, Krause, Weisze, the younger Fichte, Branisz, E. Beinhold, A. Trendelenburg, H. Ritter, A. Günther, and others; the different tendencies within the Hegelian school; and, finally, the relation which Schelling latterly took up to his own earlier teaching, as well as to that which up to his own earlier teaching, as well as to that which had been developed out of them. In the same propor-tion in which during the last fifty years the science of philosophy has been prosecuted in Germany, has also its history been studied; and indeed the Germans were the first who sought to comprehend and represent the history of philosophy as a whole, and to throw light upon the more important parts of it by valuable special extensions. the the street important parts of it by valuable special wheaties. The rapid change in the philosophic systems, and the extravagances which characterized some of them, have often been much blamed and made sport of, and it seems, as a consequence of that, that there has been for some time a bull in the interest taken in nas been for some time a full in the interest taken in speculation, and a sort of sceptical aversion to all proper philosophic inquiry has taken the place of the former enthusiasm. Yet the influence of philosophy in elevating and strengthening the scientific spirit in Germany has been great and beneficial; and there is almost no region of inquiry in which a deeper and

almost no region of inquiry in which a deeper and more thorough mode of treatment is manifest as the fruits of this philosophic spirit.—Ref. Brockhaus, Conversations Lexicon.

Greman Silven is a useful alloy, composed of 51 per cent. of copper, 30.6 of zinc, and 18.4 of nickel. It is, in fact, brass, to which nickel has been added to give it a white tinge. It is manufactured in large quantities at Birmingham, and is much used for forks, spoons, and other table requisites, in consequence of its durability, incorrodibility, and resemblance to silver. It is also much used for electro-plating.

Greman Trachogy —The important negation which

GERMAN THEOLOGY.—The important position which the Germans in the present day occupy in the field of theological speculation entitles them to some special notice in a work of this kind. The phrase German theology is commonly restricted to the doctrines of Protestant Germany, as the theology of the Catholic church there does not differ materially from Roman Catholic manuscript. and reflection, occasion was also afforded to a fanciful church there does not differ materially from mone and of speculation, which frequently had nothing Catholicism generally. It is, however, principally, farther in common with science than the name, and on this account many dark opinions in the regions of poetry, religion, and social life came to unite themselves with the philosophy of Schelling, and which often led to the most strange aberrations into romanicism, mysticism, and a tendency to Catholicism. In Christianity. The father of German rationalism is

# German Theology

generally regarded to have been Wolf (1679—1754), who introduced into theology his distinction between natural generally regarded to have been Wolf (1879—1764), who introduced into theology his distinction between natural and revealed religion, and a number of rationalistic ideas. His system was adopted by numerous theologicans, both of the Lutheran and Reformed churches, and thus at once deeply penetrated into theological literature and the schools. J. A. Ernesti, a contemporary of Wolf, established the historico-critical school of Protestant excepsis, by applying the rules of classical philology to the interpretation of the Bible. Semler (1725-91) distinguished theology from religion (i. e. morality); claimed the right to subject the whole canon of Scripture to the freest investigation, and aid down as a supreme principle, that the Scriptures are to be regarded as canonical and of divine origin, only in so far as their contents are of an ethical or moral nature. He also distinguished between a local, temporal, and therefore transitory part of the Bible, and the imperishable word of God. W. A. Teller (1734—1804) published, on the basis of the biblical studies of Ernesti, Semler, and their followers Michaelis and Bichhorn, a new system of Christian doctrine, studies of Ernesti, Semler, and their ionowers mione-elis and Eichhorn, a new system of Christian doctrine, and prodaimed a practical religion of reason, as the essence of Christianity. A new theory of far-reaching influence was set forth by Töllner (died 1774), who distinguished between Holy Writ and the word of God, the latter of which he found also in all other religions, and in reason. He distinguished different degrees of inspiration, and maintained that the same degree did mapiranon, and maintained that he same degree due not exist in all perts of the Holy Scriptures. Against the assumptions of this new school, orthodox theology was principally defended by Bengel, Crusius, Oettinger, Zollikofer, and Spalding. English deism was transplanted into Germany by Reimarus (1694—1768), in the calebrated "Wolfenbuttel Fragmenta," first published by Lessing. He denied the possibility of a revelation, and declared, as the principal doctrines of natural religion, the existence of God, a divine providence, and the immortality of the soul. Moses Mendelssohn, a Jew (1729–96), adopted the same views, and declared the happiness of man to be the principal aim of religion. Other writers of the same school were Steinbart (1738–1809): Basedow (1723–90); and Babrdt (1741–92). An not exist in all parts of the Holy Scriptures. Against Other writers of the same sensol were Steinbart (1738–1809); Basedow (1723-90); and Bahrdt (1741-92). An important organ of this school was the "Allgemeine deutsche Bibliothek," published (1765-92) by Nicolai. Lessing (1729-81) also partially belonged to this school, and maintained that Christianity is essentially a system of education for mankind, in which the Scriptures are of education for mankind, in which the Scriptures are text-books, which may perhaps be superseded when humanity is educated for the reception of the new everlasting gospel. He also held that revelation gives to man nothing more than reason alone would have sufficiently developed in time. The path marked out by Lessing was further pursued by Kant, who declared the ideas of God, liberty, and immortality, indemonstrable by pure reason, and that the only thing certain in itself is the moral law, which conducts us to a practical faith in God and immortality. Through him, the terms rationalist (one who dealers natural religion alone to be morally necessary, though he may admit revelation), naturalist (one who denies the reality of a supranatural divine revelation), and supranaturalist (one who considers the belief in revelation a necessary element in religion) came into use, and rationalism (one who considers the belief in revelation a necessary alement in religion) came into use, and rationalism and supranaturalism became the principal division of the theological schools. The first rationalistic system of dogmatic theology was published by Henke, the most complete and celebrated by Wegachaider; besides whom, among the most distinguished were Paulus of Heidelberg, and Röhr of Weimar. The foremost representatives of the supranatural theology were Storr, Knapp, Hahn, and Steudel. A middle course between these two was first attempted to be established by Raunhard, and the most prominent of his successors in neese two was urat attempted to be established by Benhard, and the most prominent of his successors in this work were Schott and Bretschneider. Instead of attempting to pursue a middle course, Sohleiermacher sought to merge the two into one entirely new system, acknowledging the claims of both. He found the proper source of all Christian life and knowledge in the proper source of Christian consciousness. proper source or an Christian are and knowledge in the pious sentiment or Christian consoiousness, in which the subject comprehends itself, both in the totality of its being and in its being determined by the Christian principle reigning in the race. In this consciousness, it becomes assured of the reality of a new divine prin-ciple of life, which reveals itself in Christianity. Heve-

## Germination

istion is not, according to him, an external law, claiming submission from the subjective reason, and nothing more is demanded of the latter than to recognize itself as being determined by the Christian principle, and more and more to penetrate itself with it. The views of Schleiermacher not only met with many supports of Schleiermacher not only met with many supporters, but likewise execused an important influence upon the schools which were opposed to it. Most of the ad-herents of Schleiermacher defended from his standberents of Schleiermacher defended from his stand-point all the esantial doctrines of biblioal orthodoxy; as Neander, Ulman, Lücke, Umbreit, Olahausen, Hundes-hagen, &c. Others attempted a middle ourse between it and German Protestantism; as Twesten, Nitsach, and J. Müller. A third school, claiming fuller indepen-dence of theological investigation, is represented by A. Schweizer and Hammgarten-Crusius. The most recent influence of lasting inventances in the development of influence of lasting importance in the development of influence of lasting importance in the development of the German theology came from the philosophy of the absolute, introduced by Schelling, and completed as a system by Hegel. According to this view, the popular religious which have existed in the world have been the several points by which the divine self-consciousness has developed itself. After the death of Hegel, his school became divided into those who used an orthodox and those who used a heterodox mode of avancasion, the one attempting to develop orthodox his school became divided into those who used an orthodox and those who used a heterodox mode of expression; the one stempting to develop orthodox views of Christianity out of his system, the other maintaining that pantheistic ideas were the true results of it. Among the former were Daub, Marbeincke, Rosenkranz, Göschel, Erdmann, and Conradi; among the latter, Strauss, author of the "Life of Jesus," and L. Feuerbach, author of the "Essence of Christianity. The so-called Tübingen school originated with F. C. Baur, who introduced the philosophy of religion, as a Christian science, into the history of Christian doctrines, and sought to comprehend the historic development of the dogma as the dislect process of the idea itself. Rejecting the authenticity of most of the books of the New Testament, and ascriving to them a later origin, he endesvoured, by numerous writings, to fill up the vacuum thus left in the history of Christi and earlier Christianity. Among his followers, Schwegler and Zeller were the most distinguished. Their writings called forth an immense number of opponents; among whom were Thiersch, Dorner, Schaff, Bleech, Hase, and Ewald. Attempts have recently been made by T. H. Fichte, O. P. Fischer, Weisse, Wirth, and sothers, to establish a system of speculative theism, in opposition to rationalistic and speculative theism, in opposition to rationalistic a cal Church Gazette, of Hengstenberg, became an influential organ of this party. It was, however, almost wholly a Lutheran orthodoxy which was thus almost wholly a Lutheran orthodoxy which was thus restored. Its principal theologians are Hengstenberg, Hävernick, Keil, Klieforth, Kahnis, Rudelbash, Guericke, Delitzsch, and a host of others. This revived Lutheranism soon split into an old and a new school, and some of the latter were charged with having introduced into the system the most dangerous innovations. Notwithstanding the great diversities that have prevailed, and still prevail in Germany, the leading tendency is towards orthodoxy, and rationalism is on the wane. In every single department of German theology an exceedingly voluminous and thorough literature has been produced, and some branches of literature has been produced, and some branches of theology have been cultivated almost exclusively in

theology have been cultivated almost exclusively in Germany.—Ref. New American Cyclopadia.
Generators, jermin-oi-shaw (Lat. germino, I sprout), in Bot., the beginning of vegetation, or the development of the embryo (which see) into an independent plant, capable of supporting itself. The time required for germination varies much, according to the nature of the seeds and the conditions under which they are planed. Generally experience accommendations. nature of the seeds and the conditions under which they are placed. Generally speaking, seeds germinate most rapidly directly after they are gathered. If preserved till they are quite dry, in some cases the process of germination requires months or even years. The seeds of the garden oreses will frequently germinate in twenty-four hours; but the majority of seeds do not germinate for from six to twenty days. Heat is the agent which most accelerates germination. A certain amount of moisture, and a free communication

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# Gerund

with the atmospheric sir, are in all cases necessary to the process. Absence from light is a favourable con-dition. Seeds sprout most readily during spring or summer, in loose pulverised and properly-drained soil, at a moderate depth; as, under such circumstances, air, moisture, and warmth have free access, while light at a moderate depth; as, under such circumstances, ari, moisture, and warmth have free access, while light is excluded. Certain chemical changes, the most important being the conversion of starch into sugar, take place in the seed, and the embryo is nourished by the products of these changes. Thus nourished, it increases gradually in size, and ultimately bursts through the integuments of the seed. Its lower extremity, or radiole, is commonly protruded first, and, taking a downward direction, becomes fixed in the soil. The opposite extremity soon elongates upwards, and is terminated above by the plumule or gemmule, which is the first terminal bud, or growing apex of the stem; and at the same time the cotyledonary portion is either left under ground, or is carried upwards to the surface. During the gradual development, the embryo continues to be nourished from the matters contained in the albumen or cotyledonary portion, and is ultimately enabled to produce its first leaves and root. The young plant is then in a position to acquire the necessary nourishment by itself, for its further support and growth, from the media by which it is support and growth, from the media by which it is surrounded; and being rendered independent of the seed, has no need of the cotyledonary portion, which accordingly perishes. The spores of acctyledonous accordingly perishes. The spores of acctyledonous plants develop roots indifferently from any part of their surface: this mode of germination is termed beterowheat. In the germination of monocotyledonous embryos, the radicle is not itself continued downwards so as to form the root, but it gives off branches of nearly equal size, which separately pierce its extremity and become the rootlets. Each of these rootlets, at the point where it pierces the radicular extremity, is surrounded by a cellular sheath, termed the coleorhiza. This mode of germination is commonly termed chall. surrounded by a centuar sneath, termed the evectors are.

This mode of germination is commonly termed endorhizad. The radiole of a dicotyledonous embryo is
itself prolonged downwards by cell-multiplication just
within its aper, to form the root; and this mode of
germination is distinguished as exorhizad. (See Boor,
STRE.)

within its distinguished as exerciscal. (See Root, Stram.)

GREUND, jer'und (Lat. gerundiums from gero, I carry), in Lat. Gram., is a part of the verb used to denote something as being done; thus, legendum, reading, from lego, I read. It is a sort of verbal substantive, being declined like a noun, but having the same power of government as its verb. In English the present participle occupies the place of the gerund.

GRENHAGES, gene-ne-roll-see (after Gesner, the naturalist), in Bot., the Gesnera fam., a nat. ord. of Diocyledones, sub-class Corollifora. Herbs or soft-wooded shrubs. Leaves wrinkled, exstpulate, generally opposite, or whorled; flowers irregular, showy; calyx half-superior, 5-parted; corolls 6-lobed; stames diandrous or didynamous, with the rudiment of a fifth. Ovary half-superior, 1-celled, surrounded by an annular fleshy dise, or by glands; style 1. Fruit espeular or succulent, 1-celled, with 2-lobed parietal placentes. Seeds numerous, with or without albumen; embryo with minute cotyledons and a long radicle. The plants of this order are chiefly natives of warm or tropical regions. On account of the beauty of their flowers, they are much cultivated in this country. There are 69 genera and about 275 species.

GREYA ROMANORUM, jest-til ro-ma-no'-rum (Lat., the deeds of the Romans), is the tile of a legendary work of the middle ages, written in Latin, and whose tales are chiefly taken from the history of the Roman emperors, or belong to that period, and are accompanied with moralising expositions; whence it is also called Effective Moralisate. The 'stories are short, and display an almost childish simplicity. They were spointed to be read by the monks, and were generally much read down to the 16th century. They were translated into several languages, and formed a risk mine for the earlier fabulists and novelists. Grässe, in his German translation of this work (2 vols. Leipnic, 1842), assigns its suthorship, apparently with reason, to a certain monk named Elimandus, who

#### Giant

Giant

carry), in Physiol., is applied to the period which interenes between the time of conception and that of delivery. This period differs greatly in different animals. In the human species it is nine calendar months, or, more strictly, forty weeks, or 280 days; but by certain circumstances the period may be prolonged or shortened by several weeks; and sometimes the birth takes place as early as the seventh month. In the cow the period of gestation is nine months, in the mare eleven, in the dromedary twelve, and in the elephant twenty-one. In the smaller animals it is much less; being in the dog about sixty-three days, in the cat fifty-six, the rat twenty-eight, in the sow four months, and in the sheep and goat about five.

GRUM, js-um (Lat.), in Bot., agen. of the nat. ord. Rosaces. The most interesting species is G. urbasum, the wood svens, a common herb in our hedges and thickets. The roots have an aromatic flavour, something like that of cloves. They were formerly much used for flavouring ale, and to some extent in medicine, for their tonic and astringent properties.

GHER, ghe, a sort of butter used by the natives of India, which undergoes a peculiar process in order that it may last for some time. The milk is first boiled in large earthen pots for an hour or two, after which it is allowed to cool, and a little dhye, or curded milk, is added, in order to make the whole more readily coagulate: after the lapse of some hours, the mass is converted into curds, and is ready for churning. The contents of each jar, to the depth of some five or six inches, are then removed or skimmed off, and placed in a larger earthenware utensil, in which they are

The contents of each jar, to the depth of some five or six inches, are then removed or skimmed off, and placed in a larger eartheaware utensil, in which they are churned by means of a small piece of split bamboo for about half an hour; then some hot water is poured into the jar, and the churning continued for half an hour longer; after which time the butter is found to be formed. When this becomes rancid, as it necessarily does in a day or two, it is again melted in an earthen vessel, and boiled until all the water has evaporated from it; after which a little salt or betel-leaf is put into it, and it is covered up in closed pots to be kept for use. Ghee forms a very important article of internal traffic through India, as the natives consume great traffic through India, as the natives consume great quantities of it, although it is not much esteemed by Europeans.

quantities of it, although it is not much esteemed by Europeans.

GRIEELLINES, gib'-hel-lines, in the history of the Middle Ages, was the name of a political party in Germany and Italy, which, with their opponents, the Greiphs, distracted the peace of these countries, particularly the latter, for several centuries. The Ghibellines were the supporters of the authority of the German emperors over Italy, to which the Guelphs were opposed. (See Guelpes and Ghierlines.)

GROSTS. (See APPARITION.)

GLINT, ji'-ānt (Fr. géant, from gigas, the Latinized form of a Greek word, probably formed from ginesthat and ge, signifying 'the earth-born'), an individual of extraordinary stature and bulk. The existence of a race of giants, or of individual instances far exceeding those enhibited in modern times, was fully believed in, up to the commencement of the present century. This belief was founded partly upon scriptural evidence, partly upon the discovery of enormous bones supposed to be those of human beings, and partly upon the accounts handed down by ancient and mediaval writers. In the Old Testament, the name of giant is applied to several races of men; but the appellation seems to refer more to violence and physical power than to stature. The Anakims and some other tribes seem, however, to have been distinguished from other races by their surerior attempts and uncontious. seem, however, to have been distinguished from other races by their superior strength and proportions.
There are several instances in the Scriptures of individual giants; such as Og and Golisth. The height of
the former is not mentioned, but the latter, at most, were appointed to be read by the monks, and were generally much read down to the 16th century. They generally much read down to the 16th century. They were translated into several languages, and formed a trick mine for the earlier fabulists and novelists. Grasses, in his German translation of this work (2 vols. Leipzio, 1842), assigns its authorship, apparently of supposed giant were exposed by the action of with reason, to a certain mouk named Elimandus, who died 1227. The newest edition of the original text is that edited by Keller (Stuttgart, 1842).

Grassaxiow, jes-tai-shun (Lat. geste:io, from gero, I posed giant were found on the Rhone: it was stated

Gilding

that the skeleton had been found in a tomb 30 feet long, bearing the inscription "Teutobochus Rex." The Parisiane growded to see the bones of the King Teutobochus; but it was afterwards found that the The Parisina growded to see the bones of the King Teutobochus; but it was afterwards found that the remains were not those of a man, but of a mastodon. In this country, Dr. Mather, in 1712, announced the discovery of the bones and teeth of a giant in the state of New York. The statement was published in the Philosophical Transactions; but it was subsequently ascertained that the bones in this case also were those of a mastodon. Among classical writers, instances are numerous of giants, but not worthy of belief. Plutarch states that, when the grave of Anteus was opened by Serbonius, the body was found to be full 60 cubits long. Pliny also relates that, at an earthquake in Orete, the bones of a giant 46 cubits in length were disclosed. Coming to more reliable evidence, it seems certain that a height of even more than nine feet has been attained. In the museum of Trinity College, Dublin, there is a skeleton 8 feet 6 inches in height; in the museum of the College of Surgeons of England, is snother 8 feet. Great diversity, as to height and airs, prevails smong the human race. In northern latitudes, men are below the ordinary standard, many being less than four feet. In temperate climates, the height varies from 4½ feet to 6 feet; but this is sometimes exceeded, as mentioned above. As a general rule, giants are of rarer occurrence than dwarfs; they are usually of a lymphatic temperament, of a delicate complexion. Often deformed, and generally badly proare usually of a lymphatic temperament, of a delicate complexion, often deformed, and generally badly pro-portioned. Their muscles also are flabby, and their voices weak. They are seldom long-lived, and in this voices weak. They are seldom long-lived, and in this respect are the reverse of dwarfs. O'Byrne, whose skeleton is in the Royal College of Surgeons of England, died at 22, while Borowlaski, the dwarf, died at 98. (See Dwar.) It has also been observed that giants show a want of activity and energy both in body and mind, while dwarfs are usually lively, active, and irascible. The causes which occasion the production of giants are not much understood. According to Geoffroy Saint-Hilaire, Bishop Berkeley attempted to manufacture a giant. He reared an orphan boy, named memufacture a giant. He reared an orphan boy, named Magrath, on certain hygienic principles, and succeeded so far that at the age of 17 he was 7 feet in height. He died, with all the symptoms of old age, when he had completed his 20th year, at which time he was 7 feet 8 inches high. It is a singular fact, that in the mythology of all the Indo-Germanic nations, giants hold a marked position. A mongst the Greeks, they were represented as hideous beings of monstrous size, having the tails of dragons, and living in volcanic districts, to which they had been banished after their war against heaven. The gods, with the assistance of Hercules, were supposed to have imprisoned them under Etna and other volcances. They were fabled to have sprung from the blood which fell upon their mother Gs (the earth) from the alain Ouranus (heaven). This mingling of heavenly with earthly descent, together with the places of their abode, evidently points to the mysterious volcanic convulsions of nature, which they were intended to typify. In the dently points to the mysterious volcanic convusions on nature, which they were intended to typify. In the mythology of northern nations, giants play a still more important part. They believed that the first created being was Ymir, "the Ancient Chaos," and the pro-genitor of the frost giants. The origin of Ymir was long before the creation of heaven and earth. In the long before the oresided of heaven and east. In the beginning, a world existed in the far north, in which was a well, from whence flowed a poisonous stream hardening into ice. As this accumulated, it formed the northern part of Ginnungagap, or the abyse of abysess, the southern extremity of which was radiant with heat and light from another world. The meeting of with heat and light from another world. The meeting of heat and cold produced drops which, by the agency of the All-Father, or orestive power, which had sent them forth, became a living being, and received a human form. Ymir, the giant, thus created, was nourished by four streams of milk, and, while he slept, a man and woman grew from under his left arm, while a son was produced from his feet. Other beings were afterwards formed from the salt and snow-covered stones, and from these the three brothers Odin, Vili, and Ve, were born. These three were gods, and having slain Ymir, they dragged him into the middle of Ginnungagap, formed the ocean and all waters from his blood,

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and from his huge body heaven and earth, and all solid bodies. All the frost giants, except Bergelmir, perished with Ymir. He begame the father of the new giant race of the Jötuns. It is a common belief in many nations that mountains and islands have been raised. namenty nations that mountains and islands have been raised, and rocks and mountains strown down, by giants. Giants are also used to typify the heathen element in its conflict with Christianity. Graous, djoor (Turk., a dog), is a term applied by the Turks to Christians, or, indeed, to all who are

ot Mohammedans.

not Mohammedans.

GIBROSITY, gib-bos'-c-te (Lat. gibbositas, from gibbus, a swelling or protuberance), in Med., is applied to a hump or other irregularity or swelling on the back, or any other part of the body.

GIBROSIS, gib'-bus (Lat. gibbus, hunched, humped), an expression applied to the convex or protuberant shape that the moon presents in its second and third quarter, before attaining the perfect circular form that it exhibits when it is full.

GINDERSES gid-denses (Sax gidio Lat. perfect.)

that it exhibits when it is full.

GIDDINESS, gid'-de-nes (Sax. gidig, Lat. vertigo, from verto, I turn), in Med., is a dizziness or swimming of the head, with more or less of mental confusion, and a loss of power to balance the body. The objects around him in many cases appear to be moving about in different directions, often conjoined with a sense of dimness or darkness, or with sounds of bells or drums in the ear. It generally comes on suddenly, and is symptomatic of various diseases, arising, as it does, from some disturbance or debility of the nervous power. It generally precedes a fainting fit, or an attack of spoplexy; attends fevers, inflamnations, and many other diseases, and not unfrequently arises from some organic disease, and not unfrequently arises from some organic disease of the brain or heart. Most frequently, however, it arises from indigestion, and may be got rid of by means of some aperient medicine. When this falls, or when it is of frequent occurrence, medical advice ought to be sought. ought to be sought.

ought to be sought.

Giff, giff (Sax. giff, Lat. donum, donatio), in Law, is the transferring of the right and possession of a thing by one man to another, voluntarily and gratuitously. In this latter respect, gifts are distinguished from grants, which are always made upon some consideration or equivalent. The giver of the thing is called the donor, the receiver the dones. Gifts are divided, as regards their subject-matter, into gifts of chattels real and gifts of chattels personal. Under the former head may be included all leases of land for years, assignments, and surrender of these leases, and years, assignments, and surrender of these leases, and all other methods of conveying an estate less than free-hold. A gift of chattels personal is the act of transhold. A gift of chattels personal is the act of trans-ferring the right and possession of them, and may be done either by writing or by word of mouth, attested by sufficient evidence, of which the delivery of posses-sion is the strongest and most essential. The law generally looks with some degree of suspicion upon gifts, and they are usually considered to be fraudient if creditors or others become sufferers thereby. Where a gift has been executed by delivery of possession, it is not in the donor's power to retract it; but so long as the gift has not been completed by delivery of possession, it is not properly a gift, but a contract, and this a man cannot be compelled to perform but upon good and sufficient consideration. The deed or conveyance and sumcient consideration. The deed or conveyance creating an estate tail is also called a gift, from the operative words of the convoyance, which are always "I give," or "have given." It differs in nothing from a feoffment, but in the nature of the estate passing by it; and gifts in tail are equally imperfect without livery of seisin, as feoffments in fee-simple. (See ENTAIL.)

GILBRETHES, gil'-ber-tins, in Eccl. Hist., the name of a religious order, founded by St. Gilbert, in Sem-pringham, in Lincolnshire, about the year 1148. The monks of the order observed the rule of St. Augustine, and were accounted canons, and the nuns followed that of St. Benedict. There were about twenty-five houses of this order in England and Wales at the time of the

of this order in England and wases we dissolution of the monasteries.

Gilding, gild-ing (Sax, gildan, to gild), the art of covering bodies with a thin coating of gold, either by chemical or mechanical means. In chemical giding, the gold is applied to metallic surfaces by the agency of chemical affinity. One of the best metals for gilding on is a mixture of copper with one-seventh of brass.

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Copper itself is too soft and dark-coloured; ordinary brass, however, serves the purpose quite well. The gold employed is calleds' fine gold,' and is 'free from alloy. In orderto apply the gold to the metal required to be gilt, it is first combined with mercury, a quantity of the former being boiled with five or six times its weight of the latter. When the gold is dissolved, and the amalgam sufficiently boiled, the fluid mass is noured out into cold water, and then becomes semi-fluid. It is next put into a piece of chamois-leather and squeezed; by which means the particles of quick-silver escape through the pores of the leather, whilst the gold is retained. The amalgam, if good, is then of about the consistency of stiff olsy, and has a greasy and gritty feel when divided with a bone spatula. In order to apply the amalgam to the surface of the copper, or other metal, it is necessary to use a solution of nitrate of mercury, as otherwise there is no chemical affinity between the substances required to be brought in contact. This solution is called, in commerce, "gilder's aqua fortis," and when a piece of metal is immersed in it, its surface is immediately converted into an amalgam to which the mercury and gold amalgam closely adhere. The methods in which this operation is performed in detail depend open the size and nature of the articles to be gilded. After receiving the gold covering, the gilded articles are washed and dried in a careful manner. Gilt articles of all the better qualities are submitted to an after-process, for the purpose of giving them a deeper orange tint, by first Copper itself is too soft and dark-coloured; ordinary in a careful manner. Gilt articles of all the better qualities are submitted to an after-process, for the purpose of giving them a deeper orange tint, by first covering them with a chemical compound, and then placing them on a heated iron plate, when the warm gold surfaces become oxidized. Most gilt articles are gold surfaces become exidized. Most gilt articles are also burnished by a stone burnisher, formed of a polished piece of black hæmatite. In the mechanical mode of gilding, gold-leaf or gold powder is applied and fixed to various substances by different means. Thus gold may be applied to wood, plaster, pasteboard, leather; and also to metals, such as silver, copper, iron, tin, and bronze; so that gilding includes several arts exercised by men employed in very different trades. Wood-work is gilt by brushing over the surface desired to be operated upon with a solution of parchment size mixed with a little whiting. After filling up the holes and irregularities, the surface is again brushed over with a composition of the same sort. shed over with a composition of the same sort. After this operation has been repeated several times, the plain parts are moistened and smoothed down with the plant parts are moistened and smoothed down with pumice-stone, &c., and when dry the work is covered with several coatings of gold size, a peculiar substance,, of which deer's fat is said to form the principal ingre-dient. The gold-leaf is then carefully laid on with a sort of fine comb, called a "tip," and pressed into the cavities with a dry camel's hair pencil. When dry, the gold is burnished with a stone in some parts. This constitutes hurnished with a stone in some parts. This constitutes burnish-gilding: oil-gilding is performed with a gold size of an oily nature; and japan-gilding, effected with japan size, is intended for those surfaces which are to be exposed to the weather. For a description of the process for gilding by means of electricity, see ELECTRO-PLATING AND GILDING.
GILL, jill (from Low Lat. gilla, a drinking-glass), is a measure of capacity holding the thirty-second portion of a gallon, or the fourth portion of a pint.
GILDENIA, gill-lo'-ne-d, in Bot., a gen. of the nat. ord. Rosuces. G. trifoliata and stipulaces are pretty North-American plants, with lobed, discoloured leaves and white flowers. The roots of both species are used medicinally, and are commonly known under the names constitutes burnish-gilding : oil-gilding is performed

medicinally, and are commonly known under the names

medicinally, and are commonly known under the names of Indian physic and American ipecacuanha. In small doses they are tonic; in larger doses, emetic.

GILLIESIACEM, gille-se-al-se-e (after Dr. Gillies, of Conception, in Chill; in Bot., the Gilliesia fam., a nat. ord. of Monocotyledones, sub-class Petaloidem, consisting of small herbaceous bulbous plants, with grass-like leaves and spathaceous flowers. There are but two leaves and southacous flowers. There are but two geners, -Gilliesia and Miersia, containing five species, all natives of Chili. Their properties and uses are

United are known by different names in commerce; Gills, gills (Swedish gel), a term applied to the apparatus possessed by all fishes, by means of which their respiration is effected exclusively through the Ginsung. (See Param.) Ginsung. (See Param.) on each side of the neck, and are composed of several amine fixed on arches. These lamine are covered Hist. Cameloparadis Girafia, is one of the tallest 938

with a vast number of minute blood-vessels, and are with a vast number of minute blood-vessels, and are so formed as to present a considerable surface to the water, so that a sufficient portion of oxygen may be received by the blood. As the oxygen is continually being removed, the water becomes deteriorated, and it is consequently necessary that a constant current should flow over them. This is effected in most fishes by their taking the water in at the mouth and expelling by their taking the water in at the mouth and expelling it under the gill-covers in regular respirations. The blood, which is continually being sent to the gills from the heart, is distributed, by means of the arteries, to every part of the body; from whence, by means of the veins, it comes back again to the heart.

Gimmlas, gim'-bills (Ang.-Nor.), the two hoops of brass in which the mariner's compass is suspended, in order to secure a briscontal nosition for the compass.

order to secure a horizontal position for the compass, card, and needle, under any circumstances. This is effected by means of their being fitted one within the other. The compans is suspended within the inner hoop other. The compase is suspended within the inner hoop is by two pivots at opposite points, and the inner hoop is suspended in a similar manner within the outer hoop, by pivots that are in a line at right angles to that which passes through the pivots, by which the compass-box is suspended in the inner hoop. A compass supported in this manner is said to be suspended on

gimbals.

Gir, or Girs, fin (contraction of engine), a machine employed for raising heavy weights, driving piles, &c. It consists of three poles, about twelve or sixteen feet long, placed in the ground eight og nine inches apart, united at the top by a rope twisted several times round each, or by an iron ring. Two of the poles are kept their proper distance apart at the bottom by a movable iron bar placed between them in a horizontal position; windless is also several by the contraction of a windlass is also secured between the same two poles about 34 feet from the ground. When in use, the gin about 34 feet from the ground. When in use, the gin is set up over the object to be lifted, and a rope, one end of which is secured round the windless before mentioned, and carried thence through a pulley at the

mentioned, and carried thence through a pulley at the top of the poles, is then fixed to it, when, by turning the windlass, by means of handspikes, it may be raised the required height.

Gin (from Fr. genièvre, juniper), an ardent spirit, largely manufactured in London and other places, and originally flavoured with juniper berries, from which it derives its name. Geneva is frequently confounded with gin; the former is, however, merely procured by the fermentation of the berries of the Juniper communication of the berries of the Juniper communication of the price of the Juniper communication of the Junipe with gin; the former is, however, merely procured by the fermentation of the berries of the Juniper communis. Hollands gin is a variety of corn spirit, which was formerly wholly imported from Holland. The popularity of this spirit induced the English distillers to produce a similar liquid; but a difference can easily be detected by good judges. At the present day, English gin consists of plain corn spirit, lavoured with oil of turpentine and a smell quantity of other substances. It is consisted that Hollands gin may contain a proportion of juniper, but as a general rule, it is not present in English gin. Every gin-distiller has a receipt of his own, which is usually kept a secret; hence the variety of flavours to be found in this spirit; as, the plain gin flavour, the Hollands flavour, the whiskey flavour, the smoky flavour, the Hollands flavour, the whiskey flavour, the smoky flavour, the flavouring of gin; among others may be mentioned sugar, bitter almonds, turpentine, creosote, lemon, cardamomas, caraways, caseia, garlic, Canada balsam, horseradish, grains of paradise, cayenno pepper, and several other herbs, seeds, fruits, &c.

GINGER. (See ZINGEER.)

GINGHAM, ging-hām (its Indian name), a cotton fabric, originally manufactured by the natives of India, from whom also it derived its name. It generally bears a coloured check pattern, which is not produced by dyeing or stamping the manufactured material, but by interweaving coloured threads. Formerly, all the gingham in use was imported into this country from India; but at the present time it is largely manufactured are known by different names in commerce; and umbrella gingham is woven with threads all of the same colour.

GINSENS. (See CAPANAX.)

of quadrupeds, as it is the largest of the Ruminant order. In points of resemblishes, the giraffs approaches the deer, the autislope, and the camel; and, besides this, has many singularities about it which are especially its own. In the length, slenderness, and firstbility of its neck, it surpasses all other quadrupeds, and peculiarities of conformation adapt it eminently for the life which it leads on the sandy desert. Its head resembles that of the camel, from the absence of a naked muzzle, and in the shape and organization of the nostrile, which are oblique and narrow apertures, defended by the hair which grows at their margins, and surrounded by cutaneous mescular fibres, by which the animal can close them at will. This is a beautiful provision of nature for the defence of the air-passages and the irritable membranes lining This is a because provision of materia to the element of the sir-passages and the irritable membranes liming the olfactory cavities, from the fine particles of sand which the storms of the desert raise up and whirl about in sufficienting clouds. The eyes of the girafic area



GIRAPPE.

laced as to take in a wider range of vision than those passed as to take in a wider range of vision that those of any other quadruped, and it is thus able to see an enemy in the rear as well as in the front when its head is elevated during the time that it is briwsing on its favourite assais plant. The weapons by which it defends itself are its horns and its hoofs. The forit defends itself are its horse and its hoofs. The lormer it does not wield by butting, as is the case with
other Cervide; but swings round with a lateral movement of the neck, and hits with them sideways: the
latter are very powerful; and sometimes a giraffe has
been known to prostrate a lion with a single kick. Its
motion in progressing is most peculiar; travelling, as
it does, in a sort of orab-like movement. It lifes both it does, in a sort of crab-like movement. It lifts both its hind and fore legs on each side of the body together, its hind and fore legs on each side of the body together, and its appearance when cantering is peculiar in the extreme. The tongue is formed to suit its habits of life, and is used to hook down the branches of trees which grow beyond the height at which its muzzle can reach. The two horus with which it is provided are peculiar to both sexes, the bony part of the same being articulated by a broad, rough, epiphysial basis to the oranium, and covered by a hairy tegument. It is mentioned in Brande's Dictionary, that "a giraffe more than two-thirds grown will est daily confinement eighteen pounds of clover-hay and eighteen pounds of a mixed vegetable diet, consisting of carrots, mangel-wurzel, baffley, split beans, and onions, and will drink four gallons of water. They copulate

in March. The female has four inguinal adders: she brings forth one young one at a birth, and the period of gestation is fifteen months. The new-born giraffe measures six feet from the fore hoofs to the top of the head, and in a few hours after birth it is able to follow the dam."

low the dam,"

GIRBER, gw'der (from Bax. gwdus, to bind), the
name given in Civ. Eng. and Arch. to long beams of
wood and iron, that are thrown across openings of considerable span, to support floors and the roadway of
bridges. Girders are of two kinds, simple and framed; bridges. Girders are of two kinds, simple and framed; the former being merely wooden beams, or beams of east or wrought iron; while the latter are beams of the above materials made of several pieces, put together in such a manner that they may be capable of offering a greater resistance to excessive pressure than a simple girder could exert. The depth and width of all girders must be proportioned to the greatest weight that is likely to be thrown on them, that they may be abbe to offer the greatest possible resistance to its pressure, with the least possible quantity of material. The strength of a girder is augmented by adding to its depth, rather than to its width, as a less capability of resistance increases directly as the width and as the square of its depth. If, for example, a beam of Norway deal that is three directly as the width and as the square of ins depts. If, for example, a beam of Norway deal that is three inches wide and six inches deep will bear a certain weight, a beam that is twice as wide will bear twice that weight; while one that is twice as deep will bear four times as much, and one that is twice as deep will bear twice as deep, eight times as much. The longer it is, the greater will be its flexibility; or, in other words, the content of the twice as deep, eight times as much. The longer at is, the greater will be its flexibility; or, in other words, if two beams of the same width and depth, but of which one is twice as long as the other, be supported at the ends, having equal weights suspended from their centres, the longer beam will exhibit a greater amount of deflection than the shorter one; the capability of resistance in griders of all kinds being inversely as the length. The manner in which the weight is thrown on a beam has considerable influence on its power of release the considerable influence on its power of rea beam has considerable influence on its power of ra-sistance. Thus a beam will not bear half as much, if all the weight be collected at its centre, as it will if the weight be distributed equally along its length. Beams will also bear a greater weight when their extremities are secured, or loaded with a weight of masonry, as in the case of graders stretching from wall to wall of a building, to support a floor. A dead uniform weight is less injurious to the power of resistance that a girder can exert, than a weight which is in motion; but it is found that the power of resistance of a beam loaded with a dead weight decreases considerably when it has sustained that weight for a long period of time. The amount of weight that should be thrown on a girder under any circumstances should never exceed one-third of the weight that would have to be applied to it in order to break it. Girders should also be shaped in accordance with the conditions under which they are to be loaded. Thus the upper surface of a girder supaccordance with the conditions under which they are to be loaded. Thus the upper surface of a girder supported at both end—what has to sustain a great weight at one point only, should be in the form of a parabola; while that of a beam supporting a uniform weight at all points, should be elliptic, the under surface being perfectly straight in both cases. Wrought and cast iron girders are made with flanges, or projecting edges of metal at the top and bottom. In cast-iron girders, the bottom flange must have a sactional area coult to six. mensus at the top and nottom. In cast-iron girders, the bottom flange must have a sectional area equal to six times the area of the top flange, as the power of cast iron to resist compression is about six times as great as its power to resist a drawing atrain; but in wroughtiron girders, on the contrary, the sectional area of the bettom them read he are to say that of the top area the area of the heater when the say that the these than the say that the these than the say that the these than the say that of the top the top the say that the these than the say that the the say that the say the say that the say that the say that the say the say that the say that the say that the say that the say the aron girders, on the contrary, the sectional area of the bottom flange need be only one-half of that of the top flange, as the power of wrought iron to resist compression is only half as much as its power to resist tension. In other points, the strength of iron girders varies in proportion to their depth.—Ref. Tate's Strength of Maderials; Rairburn's Cast and Wrought Iron for

Building Purposes.
GIBDLE, gir-dl (Ang.-Sax. gyrdel, from gyrden, to envirole; Gr. zone, Lat. cingulum), a band of leather, or some other substance, used in girding up the kins. It was more or less in common use among several of It was more or less in common use among severess of the nations of antiquity. In Scripture, the girding up-of the loins is frequently alluded to as being greatised by the Jews before undertaking a journey. Girdles of sackcloth were also sometimes worn as tokens of hu-miliation. Among the Greeks and Romans the girdle

Girondists

was a military ornament; and hence to deprive a soldier of his girdle was a mark of the deepest ignominy. The tunic of the Romans was also fastened by a girdle or belt shout the want, and it was regarded as very effeminate to uppear abroad with the tunic alackly or carelessle girdle. Hence girt came to denote diligence, activity, cleverness, and ungirt, idleness, effeminacy. The young women always wore a girdle, or sone, before marriage; and hence the phrase "Zonam solvers virgineam" was sometimes used to denote that ceremony. The girdle worn by Venus was called "cestus." Among the Romans the girdle served also as a purse; and in England it was formerly the practice for bankrupts, or insolvents, to give up their girdles in open court.

GENONDISES, je-ron-dists (Fr. Girondins), the name of a celebrated political party in France during the Revolution. They were so called from the department of Gironde, which the leaders of the party represented in the Legislative Assembly which met in the month of October, 1791. These were Verguiaud, Guadet, Gensonné, Grangeneuve, Ducos, &c., men of great oratorical powers, and who soon obtained great influence in the Assembly. Their political views, however, were not sound; and they did great mischief by their opposition to the constitutionalists; thus leaving the way open for the extreme democratic party. They were republicans, who took their political notions chiefly from the writings of the ancient Greeks, and succeeded in gaining many over to their side. For a time they had a majority in the Assembly, and the succeeded in gaining many over to their side. For a time they had a majority in the Assembly, and the king found himself obliged to select some of the more king found himself obliged to select some of the more moderate of the party to form his ministry; among whom were Roland, Servan, Clavière, and Dumouricz. For a time they seemed reconciled to monarchy; but at length the king found it necessary to dismiss them; a proceeding which led to the insurrection of the 20th of June, 1792. They, indeed, did what they could to oppose the massacres which followed; but their popularity and influence with the people was wholly gone. They subsequently endeavoured to stir up the provinces against the Parisian party, but without success. The demagogues of the city rose in arms against them, assailed the Convention, and demanded their imprisonment. They were accused, tried, and condemned.

assailed the Convention, and demanded their imprisonment. They were accused, tried, and condemned. On the 31st of October, twenty-one of them perished by the gaillotine, including Brissot, Vergniaud, Genconné, and Duoos; others perished afterwards; a fewescaped, and after the downfall of the Terroriats, again appeared in the Convention.—Ref. Lamartine's Ristoire des Girondins, 8 vols., Paris, 1847.

GLACIAL Deposits, gluis'e-al (Fr. glacial), in Geol., belong to the Pleistocene period, and consist chiefly of clays, sands, and gravels, sometimes stratified, sometimes rudely piled together, and containing great blocks of rock, which also sometimes occur scattered loasely over the bare rock-surface. These deposits, which have evidently been forzaed by the agency of glaciers, are called by various names; as, the "Great Northern Drift:" "Till" (in Scotland), a brown clay which have evidently been forrard by the agency of glaciers, are called by various names; as, the "Great Northern Drift;" "Till" (in Scotland), a brown clay with boulders; "Marls" in Wesford and Wickbow, where fossilierous marl is interstratified with sand and gravel; "Limestone Gravel" in central Ireland, chiefly consisting of pebbles of carboniferous limestone, heaped sometimes into narrow ridges forty to eighty feet high, and from one to twenty miles long, which are called "Escars;" the "Boulder Clay" in northern and central England; and "Drift" almost universally. The "Erratic Block Group" is another well-known name for these deposits. (See GLACIER, BOULDERS, DEIFF, PLEISTOCKER.)

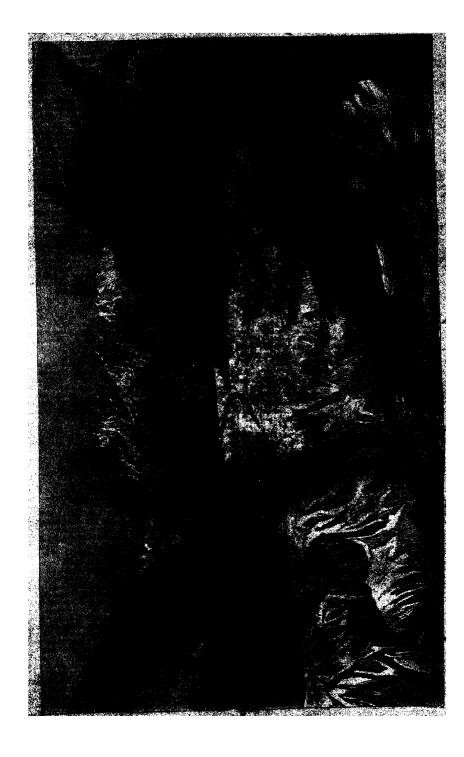
well-known name for these deposits. (ose Thables, Bouldess, Duirr, Flaismoekins.)
Glacies, glüs'-s-sr (Lat. glacies, ice), an accumulation of ice, or of anow and ice, formed in a valley or vavine of a snowy mountain. The average annual fall of snow in the region of the Swiss Alps, from 8,000 rau or snow in the region of the Swiss Alps, from 8,000 to 10,000 feet above the level of the sea, has been estimated at sixty feet; that is to any, sufficient snow descends in one year to form a bed of this thickness. The accumulation of snow on the high table-land is called the need, and is found to consist of layers of more or less everatibles can which diministration. called the nece, and is lound to consist of layers of more or less crystalline snow, which diminish in thickness as their depth increases. At a certain depth, these layers can scarcely be distinguished one from another, and still lower the substance of the neve passes into clear ice. The neve is the source of the 910

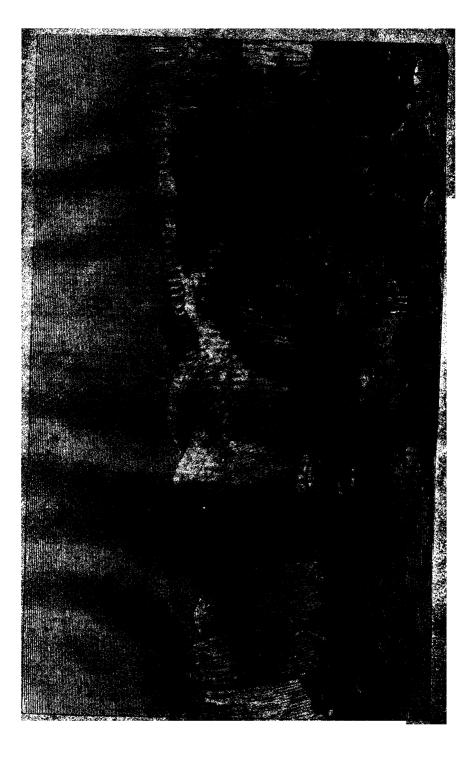
glaciers, or rivers of ice, which fill all the valleys radiating from the central mass of a great mountain. Sometimes valleys twenty miles long and three or four broad are filled up with ice to the depth of some 800 feet. Although apparently solid and stationary, glaciers more slowly down their valleys, and carry with them, either on the surface, frozen into their mass, or grinding and rubbing along the bottom, all the fragments, large and small, from blocks many tons in weight down to the finest sand and mud, that rain, and ice, and the friction of the moving glacier itself, detach from the adjacent rocks. The laws of this motion were first thoroughly investigated by Professor James Forbes, who was forced to admit that the ice-mass possesses a slight degree of plasticity, or a demicentificiality, by which it is enabled to flow down the valley just as a viscous substance, such as partially melted pitch, would flow. The researches of Professors Tyndall and Faraday have shown that ice may be plastic without being viscous, owing to its peculiar property dall and Faraday have shown that fee may be plastic without being viscous, owing to its pseudiar property of reuniting by the contact of adjoining surfaces after having been broken into fragments. (See REGELATION.) The motion of the glacier is not due to viscosity, as imagined by Forbes, but is the result of the minute, almost molecular, fracture and regelation of the ice particles, which move as if they were sand, continually thawing and re-freezing. The glaciers of the Alps, and probably those of ofter regions, descend to a vertical depth of nearly 4,000 feet below the line of perpetual snow, and into a warm climate. before the Alps, and probibly those of other regions, descend to a vertical depth of nearly 4,000 feet below the line of perpetual snow, and into a warm climate, before they finally melt away and leap forth as rivers of running water. The heap of materials of all sorts and sizes, which they deposit at their melting extremity, is called the moraine, a term which is also applied to the lines of blocks that are being carried along on the surface of the glacier. Combined with the avalance and the iccherg (see these words), the glacier is now, as it has been in ages past, one of the most important of geological agents. Professor Tyndall has lately advanced the theory that the present conformation of the Alps has been produced mainly by the action of ancient glaciers. All the great valleys have, in his opinion, been ploughed out by moving masses of ice; in other words, the glaciers have been the real excavators, and not, as usually supposed, mere accidental tenants of valleys previously formed by water denudation. The evidence of glaciers in any country during former epochs consists partly in the polished and grooved surfaces of the rocks over which they slid with their impested boulders and shingle; and partly by the peculiar contour and composition of the moraines, which differ materially from beds of diffusionings and polishings, together with the moraines, weathed boulders, bear evidence to the existence and detended boulders, bear evidence to the existence very distinct. In all the valleys of the Snowdon range, soratchings and polishings, together with the moraines and detached boulders, bear evidence to the existence of vast aluggish rivers of ice. At Plate LXI, is shown a drawing of the celebrated glacier known as the Mer de Glace; at Plate LXII, is given a drawing of the Glacier des Bois and the source of the Arveigon. Both these glaciers are in Switzerland.

GLACIS, glates (Fr.), in Mil., the inclined plane or alope that extends from the exterior of the covered way towards the open country. The great of the

supe that extends from the exterior of the covered way towards the open country. The creet of the glacis is about seven or eight feet above the terreplein of the covered way, which coincides with the natural level of the soil surrounding the fortifications. The slope itself extends about 150 feet from the covered slope itself extends about 150 feet from the covered way, having an inclination of one foot in twenty, or theresbouts, from the crest of the work to the natural surface of the ground. The glacis covers the masonry or reveturents of that part of the rampart which forms the searp of the ditch, and serves to hide it from the batteries of the enemy. It also conceals soldiers who are in the covered way from the view of the investing force, and protects them from their fire. A banquette in unually constructed in the covered way.

GLADIATORS, gläd-e-ai-tors (Lat.), a term applied in Antiq. to those porsons who fought, generally in the arena at Rome, for the entertainment of the spectators. The custom of gladiatorial combate was introduced into Rome from Asia, and some suppose that the reason of keeping up the diversion was to accustom the people to despise danger and death. The





origin of these combats seems to have been a custom in which many nations indulged, of sacrificing captives or prisoners of war to the smanes of the great men who had died in the campaign. Thus, Achilles, in the Iliad, is represented as sacrificing twelve young Trojans to the manes of Patroclus; and Encess, in the Encid, sends captives to Evander to be sacrificed at the funeral of his son Palles. In time it became the custom to sacrifice slaves at the funerals of all persons of distinction; but as it appeared barbarous to massacre them in cold blood, they were appointed to fight with one another, and endeavour to save their own lives by killing their adversaries. This took away somewhat of the horror of the spectacle, as there was a possibility of avoiding death by courage and skill. The diversion became every popular, and the profession of gladiator became an art, the masters of which were called landers by the Romans. They purchased and trained up slaves for the purpose, and then sold them to those who had charge of the gladiatorial exhibitions. At first the contests took place near the sepulchre or funeral pile of the déceased; but they were afterwards removed to the circus and amphitheatres, and became ordinary amusements. In process of time the Romans became so fond of these bloody entertainment that not only heirs coming into property, but all the principal magnistrates, presented the recole with shows origin of these combata seems to have been a custom that not only heirs coming into property, but all the principal magistrates, presented the people with shows of this nature in order to court their favour. The emperors also found it was much to their interest to provide gladiatorial displays. Titus exhibited a show provide gladiatoris displays. Titus exhibited a show of gladiators, wild beasts, and shem sea-fights, which lasted more than 100 days; and Trajan a similar solemnity, which continued for 123 days, during which time 5,000 pairs of gladiators were brought out. From slaves and freemen the inhuman sport at length spread slaves and freemen the inhuman sport at length spread to people of rank and condition; so that Augustus was obliged to issue a public edict that none of the senatorial order should become gladiators. The number of gladiators, however, increased, and the evil increased to such an extent, that Constantine issued a decree abolishing the gladiatorial shows, which, however, continued a favourite pastime till the reign of Honorius. On several occasions Rome was in danger through the On several occasions Rome was in danger through the large number of gladiators. One of the most memorable instances happened in the year 76 n.c., when seventy-four gladiators, headed by Spartacus, a Thracian, overcame their master at Capua, and fled to the mountains. There they were joined by runaway slaves and peasants, and soon became the terror of the country, and spread alarm almost to the gates of Rome. The war lasted three years, when Spartacus was slain by M. Crassus, after displaying much valour. Gladiators were classed according to the weapons which they used and the manner in which they fought. The Ordinarii fought averal together; the Eguites fought Ordinarii fought in pairs in the ordinary way; the Cateroarii fought several together; the Equites fought no horseback; the Retiarii used a fork, called a tridens, and a net, which they threw over their opponent, who was generally armod with a short sword and a shield: the Andabatæ fought blindfolded, the helmets which covered their heads having nospertures,—their ludicrous motions were very amusing to the spectators; and the Hoplomachi, who fought in complete armour; together with various others. All the gladiators were armour on the right arm, if nowhere else, and all wore helmets and carried shields, except the Rettarii. The Bestiarii, who fought with wild beasts for money, were on me right arm, it nowhere cise, and all wore helmets and carried shelds, except the Retariii. The Bestiarii, who fought with wild beasts for money, were not reckned as gladistors. When a gladistor was so severely wounded as not to be able to continue the fight, his antagonist stood over him pausing, until he should kill him or not. If he had fought well, the audience turned their thumbs downwards, to indicate that his life should be spared. If, however, he had neither shown courage nor address, they held up their thumbs downwards, they held up their thumbs, and the victor immediately passed his sword through the body of his fallen antagonist. Palms were awarded to the conqueror, and gladistors, or retiring through the body of his fallen antagonist. Palms were awarded to the conqueror, and gladistors, or retiring from horses infected is only one who has taken the infection. The best to shoot them at once, as they seld up their thumbs downwards, to indicate their discussion of the story of glanders is so strong, that all horses that have even gone near another affected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is only one who has taken the infection. The best plant, therefore, with regard to horses infected is one wort them at once, as they seld one retain to spread the disease, and geard to horse infected is described with the diborres infected is only one who has taken t

of bas-reliefs illustrating clearly the mode of fightidal

of bas-relies illustrating cleary the mouse of against of the gladiators.

Gladiators, Glade-o'-lus (Lat. gladius, a sword, in allusion to the shape of the leaves), if Bot., a gen. of the nat. ord, iridaces, consisting of plants with ensiform leaves and very showy flowers, purple, red, or white. Many species and varieties are in outlivation thanks a decream of any and cardialis are the

white. Many species and varieties are in cultivation as border flowers. G. communis and cardinalis are the favourite species: the latter is a splendid plant, with scarlet flowers, spotted with white.

GLAND, glind (Lat. glans), in Anat., is an organ of the body, composed of blood-vessels, nerves, and absorbents, in which secretion is carried on; as the lacyrnal, mammary, and salivary glands. They are variously divided by anatomists, according to their structure or their contents. In form, glands are—1. Simple; consisting of small hollow follicles, covered with a peculiar membrane, and having a proper excretory duct; as the membrane, and having a proper excretory duct; as the mucous glands of the nose.—2. Compound; consisting mucous giands of the nose.—2. Compound; coffisisting of many simple glands, the excretory ducts of all of which meet in one common duct; as in the sebaceous glands of the face, &c.—3. Conglobate or lymphatic glands; composed of a texture of lymphatic vessels, connected together by cellular membrane.—4. Conglomerate; composed of numerous simple glands, with their ducts all entering into one common trunk; as the parotid and salivary glands. According to their con-tents, they are divided into mucous, sebaceous, lym-phatic, salival, and lacrymal. There are also what are termed ductiess glands, which resemble the others in external conformation, but differ from them in the in external conformation, but differ from them in the absence of any duct or opening for the removal of the secreted fluid, and indeed, few of them contain any secreted fluid. Glandular swellings are not unfrequent, especially in weak and scrofulous persons. They occur about the neck, or other parts of the body, are comparatively paniless, and of very alow growth, with little or no tendency to suppuration. In such cases, the system should be strengthened with tonics, and stimulants applied to the part: sea-bathing is also very beneficial. Glandular swellings also cour in certain diseases; as scarlet fever, &c. diseases; as scarlet fever, &c.

GLANDERS, glind'-ers (from gland), a disease in horses, which is attended with a copious discharge of horses, which is attended with a copious discharge of mucus from the nose, and which generally preves fatal to the animal affected. Scrolulous horses, on account of their weak constitution, are generally subject to glanders. The poison produces in the blood abnormal changes, which vitiate the fluid, and unfit for healthy nutrition. From the irritant nature of the morbid fluids passing through them, the lymphatic glands and vessels become inflamed, and lymph is deposited. This being of an unhealthy nature, soon softens, and extends to the skin overlying the part, and ulperating extends to the skin overlying the part, and ulcerating sores are formed. On the surface of the more vascular sores are formed. On the surface of the more vascular nucous membranes effusions of tubercular matter are also poured out. These bring on inflammation, and degenerate into chancrous ulcers, generally un the mucous membranes of the nostrils in extreme cases of mucous memoranee of the nostrils in catterine cases or disease. It is stated in Johnson: "Farmer's Encyclopadia," that blue vitriol (sulphate of copper) in drachm doses of thin gruel, has been given with success as a remedy in some cases, and that the nostrils should also be washed with a solution of lime. Glanders is often communicated to the human system from horses affected with the disease, and generally ends in death

Glasgow, University or

Glasgow, University or, glda-go, was founded
by William Turnbull, the then bishop of Glasgow, in 1451, in terms of a bull obtained from
Pope Nicholas V. in the preceding year. Two
years after, King James II. conferred upon it,
by royal charter, certain important privileges.
"This miversity," says Dr. Reid, "came into the
world as naked as every individual doss;" it had no
property in lands or houses, besing chiefly dependent
upon the exertions of the bishop and elergy of Glasgow.
In 1459, however, James Lord Hamilton bequeathed
some property in Chasgow for the use of the College of
Arts; and a few years later, Thomas Arthurile be
queathed another tenement to the college. During
the period of the Reformation, this university was althe period of the Reformation, this university was almost completely annihilated; but in 1560, Queen Mary bestowed upon it the manse and church of the Preach James VI. endowed it with the rectory and in 1977, James VI. endowed it with the rectory and vicarage of the parish of Govan. Since that time the college has continued to flourish, and has given forth many learned men. The number of matriculated students now avemen. The number of matriculated students now averages about 1,200. It possesses faculties of artss law, medicine; and theology, with chairs for Latin, Greek, mathematics, logic, natural and moral philosophy, English language and literature, natural history, botany, chemistry, anatomy, physiology, materia medica, practice of physic, chinical surgery and medicine, midwifery, surgery, divinity, church history, Oriental languages, biblical criticism, civil law, conveyancing, civil engineering, and practical astronomy. Connected with the university are the library, comprising upwards of 100,000 volumes; the Hunterian museum, bequeathed by the celebrated Dr. William Hunter, comprising a valuable collection of anatomical preparations, coins, medals, &c.;—an observatory, and preparations, coins, medals, &c.;—an observatory, and a botanical garden. The office-bearers of the universty consist of a chancellor, rector, principal, and dean of faculties. It possesses a number of bursaries for the support of poor students, and ten exhibitions at Oxford, founded by John Suell, a native of Ayrshire, Oxford, founded by John Suell, a native of Ayrantre, who, in 1688, bequeathed a considerable estate in Warwickshire for the support of Scotch students at Balliol College, Oxford, who had studied for some years at the University of Glasgow.

GLASS, GLASS MANUFACTURE, glass (Sex. glass).—
The composition of this important substance differs ma-

the composition of this important substance diters materially, according to the use for which it is intended. It generally contains the silicates of potash, sodard lime, baryta, magnesis, alumina, and land, coloured by small portions of iron, manganese, cobalt, tranium, copper, or gold. These different varieties must not be considered as definite chemical compounds, but as a mixture of silicates with an excess of silica. The best glass, however, is found to be that which contains the minimum of uncombined silics. The celebrated Bohemian glass, so much valued in the laboratory for its Boheman glass, so much valued in the laboratory for its hardness and infusibility, contains the silicates of potash and lime in predominant proportions. The more fusible Bohemian glass, which is used for ornamental purposes, contains, in addition, anotable quantity of silicate of alumina. French plate glass and ordinary window-glass consist principally of the silicates of sods and cate of alumina. French plate-glass and ordinary window-glass consist principally of the silicates of sods and lime, soda producing a more liquid compound than potach. The ingredients used in the well-known French plate-glass from St. Gobain are 300 parts of white quartzose sand, 100 of any carbonate of soda, 43 of slaked lime, and 300 of cullet, i.e., fragments of broken glass of previous meltings. The fuel employed in the furnace is wood. Ordinary window-glass is made of a mixture of 100 parts sand, 35 or 40 of chalk, 30 or 35 of soda-ash, and from 50 to 160 of cullet. The inferior opaque or somi-opaque kinds of glass used for wine-bottles, carboys, and other articles in which inferior opaque or somi-opaque kinds of glass used for wine-bottles, carboys, and other articles in which tagnessarrow is no object, consist of the silicates of alumina, iron, lime, magnesia, and soda or potash, mixed in varying proportions. Common bottle-glass is made from sand 100 parts, soapmakere' waste 90, gas-lime 80, common clay 5, and rock-talt 3. Bottle-glass contains a less amounts of silica than any of the other varieties. The ordinary white glass used for table purposes in this country is a colourless silicate of potash and lead, and is commonly known as fint-glass, although all glass has just as good a right to this title. The oxide of lead contained in it gives it a

density, softness, fusibility, and brilliancy, qualities which render it peculiarly valuable for the purposes to which it is applied. From its high refractive and dispersive power, it is much employed for optical purposes. Optical glass is made with great care from the purest materials. A good optical glass may be made from 100 purts of pure sand, 100 of minium, and 30 of refined pearl-ash. In making fiint-glass, the melting-pots used are made of the finest Stourbridge clay, mixed with a certain quantity of old pots. The mass is worked up with water, and allowed to remain in this condition for times or four months. It is then made into pots, which are arched over at the top, having a side-opening by which the glass may be withdrawn. They are placed in the furnace in such a manner that the products of combustion may not have access to They are placed in the turnace in such a manner that the products of combustion may not have access to the hole, which would endanger the purity of the glass by reducing the lead to the metallic state. By increasing the quantity of lead, a very transparent glass, with still higher refracting power, is produced, termed pasts or strass, which is used in the white state for cutting into false brilliants, and, in combination with various metallic oxides, for imitating gems and precious stones. Coloured class is made by combining crownstones. stones. Coloured glass is made by combining crown-glass with various metallic oxides, which are dissolved by the glass in small quantities. Protoxide of iron produces green; but sesquioxide of iron has but little produces green; but sesquioxide of iron has but little colouring power, except when present in large quantities, when it gives a yellow tinge to the glass. The contrary is the case with the oxides of manganese, the protoxides producing no tint, while the sesquioxide colours the glass purple or violet. Advantage of this is taken in making colourless windowglass, in which protoxide of iron is a constant impurity. By adding a small portion of black oxide of manganese, the sesquioxide of iron and the protoxide of manganese are formed, neither of which has any colorific properties. It frequently happens that a slight excess of manganese is added; in which case the resulting class turns purple when exposed to the light. Oxide of chromium gives an emerald-green tinge; oxide of cobalt, a deep blue; emerald-green tinge; oxide of cobalt, a deep blue; protoxide of copper, a green; deutoxide, a ruby-red; oxide of uranium, an opalescent greenish-yellow; gold with oxide of tin, a ruby-red; and the oxides of silver with oxide of tin, a ruby-red; and the oxides of silver and antimony, varying shades of yellow. Coloured glass is of two kinds,—flashed glass and pot-metal. Flashed glass has only a superficial coating of coloured material, while pot-metal is coloured throughout the mass. Class may be divided technologically into two kinds,—cast glass and blown glass. The former kind comprehends British plate, which is east and polished; optical glass; and the glass used for heavy domestic utensils, which is made by a combined process of blowing and casting. Blown glass includes ordinary crown and sheet glass, and the lighter glass used for table purposes. British plate is cost in large sheets upon iron tables provided with a ledge to prevent the moiten metal from running off. Were the glass allowed to cool suddenly, it would fly in pieces, from unequal tension, at the slightest jar or blow. It has, therefore, to be cooled or annealed very gradually in an oven or furnace, after which two sheets are placed together, with a layer of polishing pasts between them, together, with a layer of polishing pasts between them, and rubbed backwards and forwards in every direction and rabbed backwards and forwards in every direction until perfectly smooth, the final polish being given to it by women's hands. Window glass is made by two different processes, one of which consists in blowing a large bubble of glass, reheating it and causing the opposite sides to coalesce into a flat disc, by twiring it like a mop while still in a melting state. Glass made the opposite sides to coalesce into a flat disc, by twitling it like a mop while still in a melting state. Glass made by this process is called exown glass. Ghest glass is made by first blowing a long cylinder and cutting off the two onds; the remaining tube is cut down the middle with a diamond, reheated, and opened on an iron table into a flat sheet. This, when polished, forms the patent plate of commerce. Since the removal of the excise duties on glass in 1845, this article has been gradually improved in every direction, until it has reached a state of perfection beyond which it seems difficult to go. The acertions made by Messrs. Chance of Birmingham have principally brought about this result, and now a piece of table glass can be bought for a few pence that but a few years ago would have cost as many shillings. The introduction of glass-engraging has raised up quite a

new branch of art, artistic ornamentation being now applied to table glass of so high a degree of excellence that a small vase-but a few inches high has been sold for two hundred guiness. The introduction of gas glass-furnaces (see Furnaca) will do much to lower the price of glass, and still further improve its quality; and even now this wonderful material is produced at so low a rate that it is mased for roofing houses and cellars at little more than the cost of ordinary roofing materials. (For fuller particulars concerning the manufacture, see Ure's Diot. of Arts, article Glass.)

Guass-nownes, the process by which fint, crown, sheet, and other kinds of glass, are manufactured. The tools employed in glass-blowing are simple, and have continued in use with elight alteration for more than two hundred years. That and skill supply the place of more claborate sids. The principal instrument used is the blowing-tube, which is made of from half an inch to an inch in diameter. It is smaller at the mouth end than at the end which gathers the at the mouth end than at the end which gathers the metal. In the manufacture of flint glass, the blowing tube, being heated at the end nearly to reduess, is introduced into the pot of fused glass, or metal as it is called, which immediately adheres to it; and by turning called, which immediately adheres to it; and by turning it round, the workman can gather up as much metal as he requires. If a large quantity be wanted, the first gathering is allowed to cool by exposure to the air, and when somewhat solidilied, another gathering of metal is made, or even a third and fourth. The utensil to be made is then finished by a process combining blowing, manipulating, annealing, cutting, &c. (See Glass Manuvacture.)
Glass, Expusing on, the art of producing designs

GLASS, ETCHING ON, the art of producing designs upon glass, by the corrosive power of hydro-fluoric acid. In order to effect this operation, the glass is covered with a thin ground of bees-wax; the design is then drawn upon it with the needle, as in etching upon copper. Sulphuric acid is afterwards poured on, and fluor spar or fluoric acid sprinkled on it. The hydrofluor spar or fluorio acid sprinkled on it. The hydro-fluorio acid which is disengaged acts powerfully upon the exposed portion of the glass, while fumes of fluo-silicic acid are liberated. After four or five hours the acid is removed, and the bees-wax removed from the glass with oil of turpentine. The glass is then found to be stched with the design required. The operation may be reversed by drawing the design upon the glass with a mixture of bees-wax and turpentine, and then subjective it to the action of hydro-fluorie said subjecting it to the action of hydro-fluoric acid.

GLASS OF ANTIMONY, in Chem., a transparent glass of a red colour, formed by fusing tersulphide of anti-mony in the open air. It is an oxysulphide of anti-mony, containing eight parts of oxide and one of sulphide.

GLASS-PAINTING, the art of painting designs upon ass, either stained or colourless, with substances glass, either stained or colouriess, who consisting usually of metallic oxides combined with a Whan subjected to a great heat, consisting usually of metallic oxides combined with a vitroous vehicle. When subjected to a great heat, the colours thus applied become permanently united with the surface of the glass. Fainted glass differs materially from stained glass, athlough the terms are considered synonymous. In stained glass, however, the substance of the glass itself has been coloured in the process of manufacture. The art of making coloured glass has been long known. It was introduced into Greace and Rome from Assertis and Error. coloured glass has been long known. It was intro-duced into Greece and Rome from Assyria and Egypt. Byzantine Greeks appear to have been the first persons who practised painting upon glass, and from Byzan-tium the art passed into the West of Europe, by way of Venice and Marseilles. In France, the art of glass-painting was practised with great success during the 12th century. After that time painted glass windows were regarded as essential in religious edifices of any pretenzion. Painted windows of the 13th century abound in France Garmany, and England, and belong pretension. Feinted windows of the 19th century abound in France, Germany, and England, and belong to the First Pointed, or Early English, style of architecture. The painted glass of the 14th century was more vivid in colour, with greater breadth in style, and more careful painting, than that of the preceding century. It was, however, less pure in conception, and not so strictly subordinate to the architectural effects. not so street, subordanies to the stremmentary a great change took piace. The windows became more individualised, and still less dependent upon the architecture. The designs were larger, and began to be treated as pictures.

After the 15th century, when Gothic architecture was declining, the medieval spirit departed from the art of painting on glass, and palages and domestic buildings began to be ornamented with painted glass windows, as well as churches. Glass began to be treated as if it were cauvas or panel, and the works of Raffaelle and other celebrated artists were either copied or imitated. The results were not good. From that period, glass-painting declined more and more, and, until within late years, has never shown any symptoms of revival. The method by which glass-painting is now practised differs in different places; but the general plan is as follows, for a small work on a single plate of glass.—A careful cartoon, the size of the painting, having been procured, the glass is laid out, a tracing made from it, and the outline is carefully traced on the glass, with black or brown, composed of a very fasible viterous flux, coloured with a metallic cxide, and ground extremely fine in an essential cil. Those parts After the 15th century, when Gothic architecture was fusible vitreous flux, coloured with a metallic oxide, and ground extremely fine in an essential oil. Those parts which are intended to be yellow, orange, or red, are then coated according to the tint required, with a mixture composed of an alloy of silver and antimony, ground up with the red oxide which is obtained by subjecting sulphate of iron to a red heat. The glass is then exposed in a furnace to a red heat, in which the tracing colour is fused, and adheres permanently to the glass. The mixture of silver and antimony colours the glass, but does not melt; so that the oxide of iron may be brushed off in the state of dry powder, leaving the glass coloured, but transparent. The other tints, composed of a very fasible class, coloured with metallic may be brushed off in the state of dry powder, leaving the glass coloured, but transparent. The other tints, composed of a very fusible glass, coloured with metallic oxides, are then added, and the whole once more ex-posed to heat. In most cases, the glass is heated, or "fired," as it is called, between the application of each colour. In making a painted window, many pieces of glass are fixed together in a leaden framework, great care being taken to arrange the several compartments from the narroon. from the cartoon.

from the cartoon.

GLASS, SOLVELS, in Chem., an impure silicate prepared by melting 8 parts of carbonate of soda or 10 of carbonate of potash with 15 of pure quarts and one of charcoal. The charcoal assists in decomposing the carbonate, and a black glass is formed, soluble in five or six times its weight of boiling water. It is used in dyeing, to impart incombustibility to wood and woven fabrics, as a varnish to preserve stone, as a vehicle in freeco-painting, and in the manufacture of soap. instead of rosin. of soap, instead of rosin.

GLASSES, MUSICAL, glas'-ses, an instrument of music, composed of a number of drinking-glasses, tuned by filling them more or less with water, and played upon by rubbing them with the end of the finger damped. The smaller the quantity of water contained in a glass, the lower is its tone: hence, it is evident that by procuring a number of glasses, exactly alike in size and shape, and putting a certain amount of water in each, suppe, and putting a certain amount of water in each, a complete scale may be formed. The skill, or rather trick of performing on these glasses, consists in producing instantly the required vibration, by a gentle and rapid action of the finger upon their edges. Mr. Pocherich, of Ireland, is said to have been the first who thempt of producing makes he this mann. who thought of producing music by this means. The instrument called the harmonica had its origin in the

instrument caused the harmonica had its origin in the musical glasses. (See Harnonica.)

Grassites, glass'sies, the name of a religious sect, which sprang up in Scotland about the year 1729, and was so called after its founder, the Rev. John Glass, who was originally a minister of the Church of Scotland, but was deposed by the General Assembly for holding printing contrasts the standard of the harmonical sections. but was deposed by the General Assembly for holding opinions contrary to the standards of the church. Ho fully explained his opinions in a tract, entitled "The Testimony of the King of Martyrs concerning his Kingdom." He was opposed to all national establishments for the support of religion, and advocated a system of independent church government. In fact, his views on this subject approached vary nearly those maintained by the Congregationalists. One of his principal disciples was Robert Sandeman, who formed a congregation in London in 1762, and, after him, this seet in England hears the name of Sandemanians. The leading tenets of the Glassites, or Sandemanians, relate to the efficacy of the atonement and the nature of faith. They hold that "the bare death of Christ, without a deed or thought on the part of man, is sufficient to present the chief of ginners apottess before

God;" and that "faith is no more than a simple assent to the divine testimony, passively received by the understanding." They maintain the necessity of a plurality of bishops, of teaching elders, in each church, but do not consider the want of learning, or employment in worldly business, any disqualification for this office. They also observe certain peculiar prectices, supposed by them to have been prevalent amongst the primitive Christians; such as weekly sacraments, love-feasts, washing each other's feet, the kias of charity, the use of lots; and in general, they attempt to carry out literally, as far as possible, the rules of Scripture. They contribute largely of their goods to the church and to the poor. For a long time they have been decreasing in numbers, and according to the census of 1851, there were only six small congregations of them in England, and a like number in Scotland; the aggregate number of sittings in all the English chapels being gate number of sittings in all the English chapels being estimated at less than 1,000.

GLAUBER'S SALT, glow'-ber (after Glauber), in Chem., the old name for sulphate of sods. (See SODA, SUL-

PHATE OF.) GLAING, glai'-sing (Ang.-Sax.), a term applied to the insertion of panes of glass into the sashbars of window-frames, and a peculiar method of polishing cutlery, as well as to the art of coating articles of earthenware and porcelain with a vitreous class this private them. glaze which gives them a smooth, polished, and us-trous surface. The term is also used in Paint, with reference to the employment of varnishes and certain reference to the employment of variances and certain transparent colours termed glazing colours; and in the culinary art, to the use of white of egg, to give a smooth and shining exterior to pastry and other articles intended for the table. In glazing earthen-ware, the ingredients that are used consist of red lead, white lead, felspar, ground flints, ground flint glass, Cornish stone and clay, sods, nitre, and borax. Various compositions are made for glazing, by mingling some of these substances together in different proporsome of these substances together in different propor-tions, according to the nature of the material which is tions, according to the nature of the material which is to be coated and the purpose for which the article is intended. Thus, in the glaze for common earthenware, white lead and ground flints predominate; in that for porcelain, felspar, borax, nitre, soda, Cornish clay and sand, are used; and for stoneware, red lead, white lead, and ground flints are mingled with the ingredients used for porcelain. For lignig chemical retorts, sand, potash, lime, and nitre are used, without any admixture of lead. The substances of which these glazes are composed are mixed with water, until they assume the consistency of crosm. When the mixture is perfectly ready for use, the ware is dipped into it, and afterwards subjected to the action of heat in an oven, which converts the liquid coating into a solid viterous glaze. (See EARTHENWARE.) into a solid vitreous glaze. (See EARTHENWARE.)
Metal-glazing is the production of a brilliant polish on outlery and steel goods, as well as articles made of brass, tortoise-shell, horn, ivory, and white metals, by means of wooden wheels from \$\frac{1}{2}\$ into four inches in width, and from four inches to two feet in diameter, the edges of which are covered with leather coated with emery-powder moistened with water. Other wheels are also used in polishing, coated with thick buff-leather, which is covered with a mixture of fine sand and water, or rotten-stone and oil, according to sand and water, or rotten-stone and on, according to the nature of the material which requires to be polished. The final polish is given with a wheel, the leather covering of which is sprinkled with crocus or metallic powder, in a dry state. Stones are polished by lapidaries in a similar manner, with wooden wheels, by lapidaries in a similar manner, with wooden wheels, which have emery spread on their edges. In window-glazing, the glass is cut to the required size with a glazier's dismond, and fastened to the sash-bars with a mixture of whiting and linseed oil, called putty, which hardens after having been exposed to the air for a few days, and retains the glass in its proper position. Before the erection of the Crystal Palace, the duke of Devonshire's conservatories at Chatsworth were the largest structures made of glass in this country, but they were eclipsed completely by the former building, in which 82,280 square yards of glass were used in panet which measured 49 inches in length by 10 inches as breadth.

Glesking, glesn-ing i Fr. claner. to glesn). was an

GLEANING, glean-ing (Fr. glaner, to glean), was an established practice among the Jews, and was sanc-

tioned by the law of Moses, who enjoins them, when they reap the harvest, not wholly to reap the corners of the field, nor gather the gleanings, which were to be left for the poor and the stranger, as were also the gleanings of the vineyard; for they were not to gather every grape. (Levit. xix. 9, 10.) In modern times there exists a very general feeling in favour of gleaning; and in England it is popularly regarded as a right which an owner or occupier cannot oppose, and that the poor who enter a field for this purpose are not guilty of trespass. The act, however, has been decided to be illegal, though the practice still prevails all over England of allowing the poor to glean the fields after they are reaped.

England of allowing the poor to give the next seven they are respect.

GLEBE, glebe (Lat. gleba, a lump of earth), in Law, is the land belonging to a parish church.

GLEE, glee (Sax. gleba, a vocal composition in three or four parts, generally consisting of more than one movement, the subject of which, notwithstanding the received sense of the word gles, may be either gay, tender, or grave. The term was not applied to vocal concerted music until long after the modrigal. The concerted music until long after the madrigat. The early glees were nothing but vocal music in parts, in which the singers began and ended together, singing the same words. Gradually, however, they became improved, and the play of words and phrases introduced. Certain words were elongated in musical expression, and points were taken up after the manner of the catch.

ner of the catch.

GUERMEN, glee'-men, a name-given by the Saxons before the Conquest to those who were afterwards called "minstrels." Their art consisted not only in heing the poets and historians of their times, but they were also buffoons, rhymers, singers, storytellers, and jugglers, all these branches being sometimes filled by one man; but oftener by several. They were the immediate successors of the ancient bards. Among the early Saxons, who came to England professedly to aid the Britons against the Picts and Caledonians, they were divided into two classes, distinguished by two supellations, the one signifying merrymakers, and the appellations, the one signifying merrymakers, and the

appellations, the one signifying meas, cotter, harpers.

Generoes, Massacre of, glen'-ko, in the history of Scotland, is an atrocious deed which was perpetrated by the regiment of Campbell of Glenlyon upon a tribe of the Macdonalds, who inhabited the lonely valley of Glencee, in the district of Lora, Argyleshire. After the revolution of 1688, many of the Scottish clans continued in arms against the new monarchy, and in August, 1691, a proclamation was issued by the government promising pardon to all who should lay down their arms or tender their submission before the lat of January, 1692. Many of the chiefs submitted and tendered their allegiance within the prescribed time. their arms or tender their submission before the lat of January, 1692. Many of the chiefs submitted and tendered their allegiance within the prescribed time. Among others, the aged Macdonald, or Maclan, of Glencoe, repaired to J Fort William, and Maclan, of submission, on the Slat of December; but the officer in command, not being authorized to receive it, referred him to the sheriff at Inversry. The journey was long and in the depth of winter; but the old man made what haste he ostild, and on the 6th of January, 1692, took the oath of Allegiance. The news that Mac Ian had not submitted within the prescribed time was, away Macaulay. "received with cruel joy by three says Macauley, "received with cruel joy by three powerful Scotohmen who were then at the English court,"—Breadsbane, Argyle, and the Master of Stair; the two former being hereditary enemies of the Maconcalds. The news of their submission was concealed, and the Master of Stair, who was secretary cealed, and the Master of Stair, who was secretary of state for Scotland, by representing to King William that the Macdonalds of Glenove still held out, obtained an order from the king for their extirpation. On February, 1692, a body of soldiers, 120 in number, under the command of Campbell of Glenlyon, were sent to occupy Glenove. They came professing friendship, and were received with the kindest hospitality by the people. On the evening of the 12th of February, the officers supped at Macdonald's house, and played cards with himself and family. The following morning at five o'clock was fixed for the bloody deed. Lieutenant Lindsay and a party of soldiers returned to the old chief's house, knocked, and were admitted. Macdonald rose from his bed to receive them, and willed ordering his servants to bring some refreshment for them, he was shot through the head. Two of his Globe

attendants were slain with him, and his wife received such cruel treatment that she died on the following day. Like bugchery took place in the other houses. The intention was to slaughter the whole tribe; but owing to the inclemency of the weather, a detachment of soldiers sent to guard the outlets of the valley did not arrive in time, and about three-fourths of the people escaped to the mountains, where many of the women and children perished with cold and hunger. "About thirty corpees," says Macaulay, "lay wallowing in blood on the dunghills before the doors. One or ing in plood on the aungulus before the doors. One or two women were seen among the number, and a yet mere fearful and piteous sight,—a little hand which had been lopped off in the tunuit of the butchery from some infant." The deserted hamlets were then set on fire; so that, when the wretched inhabitants returned, they found no place to receive them. The matter was attempted to be kept as private as possible, and various attempted to be kept as private as possible, and various attempts were made to conceal the truth, so that it was nearly a year after the crime was committed before it was published to the world. At length the popular cry became so great on this subject, that a commission was nominated in May, 1695, to investigate the whole matter. The report was laid before the house of the factitish and the way of the statement of the statemen Scottish parliament on the 23rd of June; and though it contains a clear and just statement of the circumstances, yet no punishment was inflicted on the au-thors of the crime. A graphic account of the massa-cre of Glencoe is given by Macaulay in his History of or of Glencoe is given by Macaulay in his History of England, vol. iv., and Campbell has made it the subject of a poem, "The "Pilgrim of Glencoe." A writer in Blackwood's Magazine for July, 1859, criticises severely Lord Macaulay's account of the massacre, whom he accuses of partiality in attempting to screen William; and concludes that the king's "signature was affixed to the order with full knowledge of the facts, and that his intention was to strike terror into the Highlanders by the 'extirpation' of a clan too weak to offer any formidable resistance, but important enough to serve as a formidable example."

GLOBE, globe (Lat. globus, Fr. globe), a name that is commonly applied to any spherical body, but more especially to the earth, and to the spheres on which representations of the earth's surface, and the relative position of the heavenly bodies, are delineated. These are respectively termed the terrestrial and celestial globe.

are respectively termed the terrestrial and celestial globe.
GLODE-MAKING, the art of making spheres, on which the surface of the earth and the field of the heavens, as it appears to our view, are represented. It is an operation requiring great care and nicety throughout the entire process. A spherical mould, which is generally turned out of a piece of hard close-grained wood, with wires projecting from diametrically opposite points, to represent the earth's axis and poles, is first covered with paper tightly pressed all over its surface. On this several layers of paper are pasted, one above another, until a pasteboard shell of sufficient thickness has been formed about the mould. This shell is then divided into two equal hemispheres, in a line corresponding to that of the equator of the globe, when it is completed. The edges of these hemispheres, which are reseally removed from the mould, in consequence of the first coating not having been pasted to it, are fastened to a piece of wood, corresponding in length with the internal diameter of the sphere, or two pieces of wood joined at right angles to each other, if the globe be large, after which they are securely glued togother, a wire being passed through the sphere and the wood in the centre, to form the poles of the future globe. Several coatings of plaster, made of whiting, oil, and glue, are then applied in succession, until the surface of the sphere presents a perfectly smooth and even appearance. During this part of the process, care is taken to make the sphere revolve easily and freely about its axis, and with regularity, by increasing or diminishing the weight of plaster at any point where it may be necessary. The lines of latitude and longitude that are necessary to guide the manufacturer in putting on the external covering are next drawn on its surface by the aid of a beam compass, and the sphere is now ready to be coated with goven of thin but tough putting on the external covering are next drawn on its surface by the aid of a beam compass, and the sphere is now ready to be coated with gores of thin but tough or paper, on which the outlines of the principal features of the earth's surface, and the names of the different explained in alphabetical order.—In Jurisprudence, parts of the land and water, have been printed from

CHORS

plates prepared by the engraver. The gores for globes of ordinary size are generally twelve in number, each embracing an extent of 30° of longitude along the equaembracing an extent of 80° of longitude along the equator, and extending to about the 67th parallel of latitude north and south of that line. The spaces left uncovered about the poles are covered with circular pieces of paper, extending as far as the arctic and antarctic circles. Great skill is requisite in pasting on the gores, to prevent the edges from overlapping. The globe is afterwards coloured and varnished, and the extremities of the axis are inserted in the ends of a semicircular meridian ring of brass in small globes, and of iron in large globes, made for school purposes, divided into 180 degrees, within which the globe revolves on its axis, and by means of which the latitude and longitude of any place on the globe's surface can be determined and read off. The metal meridian moves freely in a and read off. The metal meridian moves freely in a wooden hemisphere-frame, on which the astronomical horizon is represented by a broad ring which surrounds the globe in a horizontal plane, dividing it into two equal parts. This ring, called the wooden horizon, is covered with paper divided into 360 degrees and compartments of 30 degrees each, marked grees and compartments of 30 degrees each, marked withathe signs of the zodiac, and other things requisite for working problems on the terrestrial and celestial globes. Gibbes are made of all sizes, from three to thirty-six inches in diameter, eighteen inches being the diameter of globes of the ordinary size. They are sometimes made of paper, and constructed in such a manner that they may be folded up and laid saide when not in use. Globes of this description, for schools and public lectures, have been made measuring as much as ten feet in diameter. Embossed globes, or globes having the land raised in relief on the surface, are made in moulds. Globes have also been made of gutta-peroha, which can be taken to pieces and put

are made in moulds. Globes have also been made of gutta-percha, which can be taken to pieces and put together again at pleasure.

GLOBULARIA, glo'-bu-lad'-re-d, in Bot., a gen. of Selaginacea. The species are European shrubs and herbs. The leaves of G. Alspum form the wild senna of Germany, which have been sometimes employed to adultants annual same. adulterate senna-leaves. In small doses they act as a tonic, and in full doses as a safe, mild, and efficient purgative.

purgative.

GLOBULE PROJECTION, glob's-lar, the name more particularly applied to a kind of projection, very seldom used in man-making, in which the eye is supposed to be situated at a point which is distant from the part of the globe that is represented by one half of the chord of an arc of 90°. In this description of projection most of the great circles that appear on the map take the form of ellipses.

GLOBULE, glob'sule (Lat. globulus, a little globe), a small particle of matter of a spherical form. The term is more particularly applied to the microscopic particles which float about in the transparent serum of blood.

GLOBULIN, glob'sules (Lat. globulus), a term applied

blood.
GLOBULIN, glob'-u-lin (Lat. globulus), a term applied in Org. Chem. to one of the protein bodies, or albuminates, when associated with hamatin. As hæmatoglobulin it forms the principal ingredient of the blood globules; mixed with albumen, it is also found in the cells of the crystalline lens of the eye, and is then distinguished by the name of crystallin. Although closely resembling albumen in many of its relations, it differs from that substance in being precipitated from seid and alkaline solutions when perfectly neutralized. It is also, when in solution, completely precipitated by carbonic acid gas.
GLOMEBULE. (See INFLORESCENCE.)
GLOBIA IN EXCELSIS, glo'-re-a in else-sel'-sis (Lat., glory to God in the highest), is the name of a hymn in the communion service of the Church of England, and is so called from the words with which it begins. It is founded on the hymn of the Angels, given in Luke ii.

founded on the hymn of the Angels, given in Luke ii. 14, and is very ancient, appearing nearly as now used in the Apostolic Constitutions. In the Roman Missal it stands at the beginning of the office for the communion.

of the Justinian code, which were generally written between the lines of the text and on the margin, and between the lines of the text and on the margin, and were hence called glosses interbineers and glosses more sinales. These glosses were sometimes held to be of equal authority with the text itself. Accurains, who died about 1260, collected and arranged the glosses of his predecessors. The practice of introducing glosses was also adopted with the books of the cason law. Grossa, or Grorra, glos-så, glot-så, glot-så, glot-så, nanat, is a name given to the tongue, and forms part of the name of various parts connected with that organ. The glosso-pharyngeal nerves are the ninth pair of nerves, rising from the processes of the cerebellum, and terminating by numerous branches in the muscles of the tongue and larynx.

Grosserts, glos-si-sis (Gr.), in Surg., is applied to

the tongue and larynx.

Glossitts, glos-si'-tis (Gr.), in Surg., is applied to inflammation of the tongue. It may result from various causes; as mechanical injury, exposure to cold, the use of mercury, &c. The tongue becomes greatly swollen, and is painful to the touch; respiration and deglutition are much interfered with, and one of the chief dangers of the attack is suffoctation. In mild cases, the application of leoches to the part, with the use of purgatives, will afford relief; but in the more severe forms the knife is to be freely used, and pretty deep ionisions to be made into the indiamed part, which will afford almost instantaneous relief.

GLOTTIS, glot'-tis (Gr.), in Anat., is the name given to the superior opening of the larynx, situated immediately behind the root of the tongue, and covered by

distely behind the root of the tongue, and covered by the epiglottis. (See LARYEX.)

GLOVE, glue (Sar. glof), is a covering for the hand, which is divided into compartments for each separate finger. Xenophon asserts that the Persians used gloves in cold weather, and makes a charge against them, on that account, for their luxurious habits. They were in carly use in England, as is learned by their Saxon name; and in the middle ages they were decorated with gold and precious stones, and formed a costly article in the dress of kings, nobles, and prelates. In the days of chivalry, it was the custom for the knights to wear the glove of a lady in their helmet, and this gift from the fair sex was esteemed a great favour, the knight's success in arms being considered as owing to the virtue of the lady. Throwing down the glove, or gauntlet, was likewise esteemed a challenge to single combat amongst our ancestors, and he who took up the glove thus cast our ancestors, and he who took up the glove thus cast down was deemed to have accepted the wager of battle. According to an ancient custom, it is the practice on a maiden assize,—that is, when there is no offender to be tried,—for the sheriff to present the judge with a pair of white gloves; also, during the time fairs were held, it was the custom to hang out a glove from the town-hall, and as long as it

hang out a glove from the town-hall, and as long as it remained suspended there, all persons visiting the fair were privileged or exempt from arrest; and the taking down of the glove was a signal that the fair was closed and the privilege at an end.

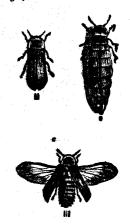
GLOVE MANUFACTURE.—The principal substances of which gloves are made in the prefent day are dogskin, doe, buck, lambskin, kid, and various other kinds of leather; besides silk, cotten, wool, and admixtures of the same. Particular kinds of gloves are known more from the place in which they are manufactured, howfrom the place in which they are manufactured, how-ever, than from the substances of which they are com-posed; as Berlin, Woodstock, Limerick, and Kendal. Kid gloves are the most used, and obtain the highest price in the market; the best of these are of French price in the market; the best of these are of French make, and hardly any of English manufacture can come up to them in point of elasticity and general excellence. Sheepskin gloves are usually of a white colour, and are greatly used in the army. Doeskin gloves are of a soft leather; and Woodstook gloves are a coarser variety of these. The English glovers were a coarser variety of these. The English glovers were incorporated as a "guild" in the reign of Charles II., in the year 1863. The process of glove-making is very simple; and, since the introduction of machinery into the trade, admits of no complicity of manufacture. The dressed skins are first cut out by cutting-machines, and the finger and thumb pieces are likewise separately cut. These disjointed particles of the glove are given into the hands of the sewers, who work it up into the desired form. The sewers use a clasp or clam, which is held between the feet and knees, and clasps the leather

while being sewn. It is stated that, during the years 1856-7-8, French gloves were imported into this country at the rate of 4,000,000 pairs per annum. There is no doubt that the sewing-macfines have considerably lessened the cost of glove-manufacture since they were introduced into England; and although we are not on a par with the French in the average quality of our gloves, yet some of what are termed the "best town-made" are equal to, if they do not surpass, any of the productions of the Paris glovers.

GLOW-WORM, glo'-wurm (Ang.-Sax.). (Lonworis

GLOW-WOLM, glo'-wurm (Ang.-Sax.), (Lompyris noctiluca).— This well-known insect is rather more than half an inch in length, and of a blackish colour.

than half an inch in The thorax is mar-rined with dusky red, the legs and the segments of the body being of the same colour. The female resembles the mule, but is quite destitute of wings. It is not certainly ascercertainly ascertained whether the male glow-worm is capable of emit-ting a phospho-rescent light; and it is generally a-greed, that if the power exists at all, it is in a very slight degree: it is to the female that the name of glow-worm. applies. The light proceeds from the under part of the abdomen, and near the tip; and it appears that the insect has the power to increase or subdue



1. BRITISH GLOW-WORM, FRM. 2. DITTO, MALE. 3. MALE, FLYING.

sect has the power of the intensity of the light at will. Latreille ascertained by experiment that the glow-worm will live a long time without air, and in different kinds of gases. If the luminous part of the body be removed, it will continue for a considerable time to shine; and when the light is apparently extinguished, can be again kindled by softening the matter in v. ier. If immersed in warm water, the insect still preserves its luminosity, but if placed in cold water, the power is suspended. The female being a slow-moving inactive insect, it is supposed by some naturalists that the light emitted by the female acts as a beacon to the opposite sex. The larves have been kept beacon to the opposite sex. The larve have been kept for a considerable period, living upon snails, and killing those of the largest size. "Sometimes they would seize those of the largest size." Sometimes they would seize a snail whilst crawling, and when the animal retired within its shell, they would still keep their hold, and allow themselves to be carried into the shell with the snail; and although they became enveloped in the mucous servetion, it very seldom appeared to adhere to their bodies. Upon being touched or disturbed in any way, the larva emitted the phosphoric light, but not to sogreat a degree as the perfect insect."—English Cyclopadia, art. Lampyride.

GRUUINIUM, glu-sin'e-tum (symbol Gl., eq. 6.9), is metal of comparatively rare cocurrence in nature.

a metal of comparatively rare occurrence in nature, where it is found in combination with silicio acid and where it is found in combination with silicio acid and alumins in the emerald, beryl, and enclase. It is prepared in the same way as aluminum, by decomposing the chloride with potassium or sodium. It is very similar in its properties to aluminium, forming, like it, a seequioxide, glucina, GlpO<sub>3</sub>. Glucina is generally prepared from a mineral called the emerald of Lumoges, which contains silicute of alumina and glucina. It is a white, infusible, insoluble powder, closely resembling alumina, differing from it in forming a carbonate by exposure to the air, and by not forming alums in combination with alkaline sulphases. Its salts have a peculiar sweet taste; hence its name, from glukus, sweet. Its salts have not as yet received any application.

C

Glucoss glu-kose (Gr. glubus, sweet), in Chem, starch, or grope-sugar. A sugar formed from starch, either in the natural organism, or by allowing a mixture of starch and water to flow into a vessel containing a solution of sulphuric acid of one per cent. strength, at a temperature of 130°. The liquid is continually stirred and kept in a state of shullition for half an hour, as soon as all the starch has been added. The liquid is one drawn off and neutralized with chalk, the precipitate allowed to subside, and the clean solution set aside to crystallize. Glucose crystallizes in hard warty concretions, composed of hard transparent cubes. With common salt it forms a compound that crystallizes with facility. It also forms parent cures. When common sair is forms a com-pound that crystallizes with facility. It also forms definite compounds with the alkaline bases, giving rise to a powerful uncrystallisable acid, called gluoic acid. (See also SUGAMS.)

GLUS, glu (Fr. glu). (See GELATINE.)
GLUMACHE, or GLUMIFERE, glu-mai'se-e (from Lat.
gluma), in Bot., a sub-class of the Monocytyledones,
consisting of plants with parallel-veined, permanent
leaves and glumaceous flowers. It includes the Sedges and the Grasses. (SecCYPERACEM and GRAMINADEM.)
GLUMER, glumes (Lat. gluma), in Bot., the outer
bracts of the locusts or spikelet of a grass. (See

BRACT; GRAMINACES.)

BEAGT; GRAMINACEM; GLUTEN, gist-ten (Lat.), in Chem., a characteristic ingredient in cereal seeds. If the flour of wheat or rye be made into appaste with water, and washed in a bag of fine linen, the starch is carried down by the water along with the sugar and destrin: the remainment water along with the sugar and destrin: the remaining grey, sticky, and mucous mass is gluten. It cannot be regarded as a definite body, for, by means of hot alcohol, it may be separated into at least three distinct substances,—one soluble in cold alcohol, which may be precipitated by water in a form resembling albumen, and termed glutin; another deposited by the alcohol as it cools, which has the composition and properties of casein; and a third, which remains undissolved, which may be regarded as vegetable fibrin. Gluten may be assumed to be the principal flesh-forming substance contained in wheat.

Guzgerne, glisterses (Gr. glakus. sweet). in

stance contained in wheat.

GINCHERINE, glis'-er-sen (Gr. glukus, aweet), in Chem. C. M. O., the sweet principle of oils and fats, which is separated from them during the process of saponification; in other words, it is the substance to which stearic, palmitic, oleio, and the other fatty acids, are united in stearin, olein, palmitin, &c. It is a viscid, colourless liquid, of a sweet taste, soluble in water and alcohol in all proportions, but sparingly so in ether. It dissolves most of the deliquescent salts, and many other substances which are soluble so in ether. It dissolves most of the deliquescent salts, and many other substances which are soluble in water. It is slightly volatile at 212°; but if distilled atone, decomposes. It may, however, be distilled numbtered in a current of superheated steam. From its possessing the property of never drying up at ordinary temperatures, it has received many applications in the arts and manufactures. In Med., it is also used in preference to all or other fatty matters. tions in the arts and manufactures. In Med., it is also used in preference to oil or other fatty matters, to keep sores in a soft condition, on account of the case with which it may be washed off. Chemists are somewhat at variance as to its true composition,—one party considering it to be the teratomic alcohol of a base, glyceryl, C<sub>a</sub>H<sub>7</sub>, as vinous alcohol is the alcohol of a base, cthyl:—

in fact, the hydrated oxide of glyceryl. Gerha considers it to be formed on the base glycyl, thus:-Gerhardt

The waxes and spermaceti are not compounds of glycerine. By a very complicated series of actions, Berthelot has been able to form glycerins by synthesis. GLYCHERINE, NITHO. (See NITHO-GLYCHERE). GLYCOCOLL, gli'-ko-seen, gli'-ko-kol, a kind of sugar, obtained from gelatine by the action of sulphuricacid. By transmitting nitrous acid through the aqueous solution, glycocollic acid is formed, which is very similar to lactic acid in its properties. GLYCOL, in Chem., a colourless slightly visoid liquid, with a sweet taste, obtained by distilling binoxide of 947

ethyline, triturated with acetate of silver, and digest-ing the resulting binacetate of glycol with hydrate of potash. The mixture is distilled as soon as the action is complete, and glycol passes over. Its composition ing the resulting binacetate of the school as the school potash. The mirture is distilled as soon as the school potash. The mirture is distilled as soon as the school potash. The mirture is distilled as soon as the school is complete, and glycol passes over. Its composition may be represented by the formula C.H.O., or vinous alcohol, in which the C.H. has a doubly atomic power, being united with four equivalents of oxygen instead of two. It is a very interesting substance to the scientific chemist, the discoveries of Wartz proving it to be the type of an extensive series of derivatives, as numerous as those derived from ordinary alcohol. In a paper read before the Chemical Society of London, he stated it to be the connecting link between the organic and inorganic products of chemistry. An elaborate article on the subject may be found in Miller's "Elements of Chemistry," vol. iii.

GLYCYERHIZA, glis-o-ri'-ad (Gr. glukus, sweet; risa,

on the subject may be found in maniers " macments or Chemistry," vol. iii.

GLYCYRRHIA, glis-e-ri'-zā (Gr. glukus, sweet; riza, root), in Bot., Liquorioe, agen. of Laguminoses, sub-class Papilionaeca. The roots or underground atems of G. glubra, the common or smooth liquorioe, G. echinate, the cohinate-podded liquorioe, and other species, posses a remarkably sweet taste, which is due to the presence of ane nnerystallizable sugar, to which the names of Glycyrrhiein, Glycion, and Liquorice sugar, have been given. The dark-coloured extractive matter which the primares firmish on decoction, contains a large given. The dark-ocloured extractive matter which the rhizomes furnish on decoction, contains a large proportion of this peculiar substance. The extract inspissated is largely imported into this country, under the names of liquorice juice, Brantsh juice, and Italias juice. That imported from Spain is prepared from G. glabra; that from Italy is the produce of G. schwala. About fifty acres of the former plant are under contents at Michele made illuments the profession. nata. About fitty acres of the former plant are under culture at Mitcham, and still more at Pontefract. The annual consumption of liquorice in England is from 1,200 to 1,500 tons. It is used for confectionery purposes and in medicine for flavouring, and as a demulcent pectoral. The great proportion is, however, used by the brewers for colouring porter. Various preparations of liquorice are commonly kept in the shops, and add at the the same of liquorice Postefract. tions of inquorice are commonly kept in the subject, and sold under the names of pipe liquorice, Pontefract lozenges, extract of liquorice, and Solezzi juice. In France there is an extensive use of liquorice-water in the promenades and public places, under the name of coco. It is also sold extensively under the name of the promenaces and punc places, under the name of erguose, in the towns of Turkey and Egypt, like sherbet. Previous to the war, the consumption of liquorice in North America had reached 4,000 to 5,000 tone per annum. The great use of this extract, as a preservative of manufactured tobacco, will partly account for this enormous consumption. The price of liquorice in the United Kingdom has fallen considerably lately, in consequence of the heavy duty formerly paid upon it having been abolished by Mr. Gladstone.

Girphography, gliphy-suffe.— In this process a plate of metal has an ordinary etching-ground placed upon it. The metal is etched in the usual manner. It is afterwards submitted to the action of a voltaic battery, whereby a plate with the drawing in relief is obtained. This plate may be printed in conjunction with type, or separaftely, at a typographical press. The process, which is now very little practised, was intended as a cheap substitute for wood-engraving. Graz, saft (Sax. gnat, Lat. culex), the common type

intended as a cheap substitute for wood-engraving.

Gran, nit (Sax. gnat, Lat. culex), the common type
of the gen. Culicides of Latraille, which is a fam. of
dipterous insects of the section Nemocera. The proboseis is long and slender, projecting forwards, and
terminated by two little lip-like appendages; sucker
composed of six slender bristle-like members; palpi composed of an assence pristie-like members; palpi 5-jointed, generally elengated; antenne filiform, covered with hairs; eyes contiguous, no coelli; wings inclined to the body, and having one marginal and two aubmarginal cells. The common gnat is less than a quarter of an inch in length, and is identical with the length of the control a quarter of an inch in length, and is identical with the insect termed cousis in France and maggatio in America. The pain and irritation which ensure from its sting are caused by the proboscis piercing the skin and a poisonous fluid being injected at the same time. The humming noise which accompanies its flight is caused by the ribration of its wings, which move very rapidly. Granss, rise, in Gool., originally a German term for a peculiar grantite-looking rock, occurring at the very base of the so-called "primary strate;" but now applied not only to the one rock, but to the whole suite of hard crystalline granitoid schists which constitute the lowest portion of the metamorphic strate.

GNETACER, no-tai'-se-e, in Bot., the Jointed Fir fam., a nat. ord. of Dicotylegones, sub-class Gymnospermia.
GNOME, nome (Gr., a sentence or opinion), in Lit. GROME, some (Gr., a sentence or opinion), in Lit., is a short sententious saying, conveying some maxim or moral precept. In the Bible, the Proverbs of Solomon and many of the sayings of Christ afford examples mon and many of the sayings of Christ afford examples of the gnome. The gnomic poets are those Greek poets whose remains consist chiefly of gnomes, short sententious precepts and reflections. The principal writers of this class are Theognis, Solon, Tyrtsens, Simoniers. The best collection of these poets is that of Brunck (Strasburg, 1784; new edition, Leipsic, 1817).

GROME (Gr. paomon, knowing, cunning), is the name given by cabalistic writers to a certain class of name given by cabalistic writers to a certain class of elemental spirits, which they believe to inhabit the earth, and to preside over its treasures. They were of both sexes, and some were said to be beautiful, and others ugly. They sometimes did good, and sometimes evil, to man, the latter especially when they were irritated. The well-known German Rübezahl is a being of this class.

being of this class.

GNONOM, not-mon (Gr. gnomon, the style of a dial), the plate which projects from the face of a dial, the shadow of which shows the time of day according to the aun, as it moves along the graduated edge of the dial-plate. In constructing a sundial, the plate is placed either in a vertical or horizontal position (see SUNDIAL), and the gnomon must be in the plane passing through the meridian of the place, having its cloping edge parallel to the axis of the earth, and forming an angle with the horizon equal to the latitude of the place.—In Math., this name is given to the of the place.—In Math., this name is given to the figure formed by either of the parallelograms about the diameter of a parallelogram, and the complements or subsidiary parallelograms, that make up the entire figure when it has been divided into four parts, by two lines drawn parallel to its sides, and transversely to each other, through any point in the diameter.

cano oner, through any point in the diameter.

Grownon's Projection, no-non's it, the name given
to the method of projecting the whole or a part of a
sphere on a plane surface, which is based on the method
adopted in the construction of a sundial. The eye is
in this case supposed to be in the centre of the sphere,
and all its creat given are consequently received or and all its great circles are consequently projected on any plane surface, beyond that of the sphere in straight lines, a property which is entirely confined to this hand of projection. Sir John Lubbock's Maps of the

Aind of projection. Sir John Lubbock's Maps of the Stars, originally published by the Society for the Diffusion of Useful Knowledge, and now by Stanford, are drawn in this manner; the sphere of the heavens being supposed to be inclosed within a dibe, on each side of which a sixth part of the sphere is projected by straight lines drawn through the centre.

GROSTICS, nos'-tiks (Gr. gnosis, knowledge), in Eccl. Hist., is the name given to various sects in the early history of the Church, who sought to incorporate the teachings of heathen philosophers with the system of Christianity. Their doctrines were very various, so that it is difficult to give any general account of their principles. According to some, they derived their doctrines from the Alexandrian philosophers; according to others, from the Jews or from the Orientals. There can be little doubt that each of these sources contrican be little doubt that each of these sources contributed to build up the fabric of Gnosticism, some sects taking from one, and others from another, and some, perhaps, from all the three. The apostle Paul, even during his ministry, complains of attempts being made during his ministry, complains of attempts being made to ingraft Jewish and heathen customs and opinions upon the Christian faith; and hence Gnosticism is frequently traced back to this early period. There can be no doubt that the sect became very powerful in the Church soon after that time; and their opinions exercised a great influence upon Christian theology. One of their leading principles seems to have arisen from their in hills to account for the arisence of early in of their leading principles seems to have arisen from their inability to account for the existence of evil in the world. They could not see how God, as all-wise, powerful, and good, could allow evil to exist at all; and they were led to conclude that matter must contain within itself the principle of evil. Hence they came to the conclusion that God had nothing to do with the creation or sustenance of the world, but that he created two beings, called Econs, or emanations, from which sprang other scons, and others from these, an innumerable host, the lower descent being always less perfect than those above them. One of these 523

seons was Demiurgus, who created this world, and was the God of the Old Testament. To counteract the evil that existed, God sent Christ, one of the highest the God of the Old Testament. To counteract the will that existed, God sent Christ, one of the highest sons, into the world, to restore man to the knowledge of himself. They had very inferior notions of the character of Christ, and denied that he suffered death, or that he really underwent the sufferings recorded of him. They did not believe in the resurrection of the body, deeming it too gross for a higher deatiny. Their beliefs influenced their lives in two very different ways, leading some to mortify the flesh, in order to bring themselves into closer communion with God, and leading others to give way to every sinful lust and passion, in order to show their total disregard of the body. In process of time they split into various divisions, differing widely from each other both in faith and practice. Among the principal Choostic sects may be mentioned the Nicolaitanes, Saturaines, Cerinthians, Basilidians, Valentinians, Ophites, Carporatians, Antitactes, Docets, Marcionites, Tationists, and Bardesanists. The system of Gnosticism disappears about the 5th century.—Ref. Mosheim's and Neander's Church Histories; Möhler, Versuch über den Ursprung der Gnostiken, 1831: Baur, Die Christichen Gnosis in geschichtliche Entwickelung; Gieseler's Ecclesiastical History.

GNU, nu.—This snimal is an equise antelope, belonging to the section denominated Connochetes. It has a broad a pread an pread an pread an expansion was a support of the property and pread appread app

ing to the section denominated Connochetes. It has broad, spreading muzzle; horns lent downwards and outwards, broad at the base, and tapering to a point; the tail long and busby, like that of a horse; the frontal bone much depressed, and the intermaxillary bones elongated. The guu, or kokoon, as it is va-riously termed, inhabits the plains and wilds of South Africs, where it roams about in extensive herds. In Africs, where it roams about in extensive herds. In appearance it is very singular, and at a distance resembles a full-grown ass. The neck, body, and teil, as well as the pace of the gnu, are nearly identical with that of a donkey or small horse, while its horns, and the long hair which surrounds its face and muzzle, give it the most uncouth appearance imaginable. The gnus are extremely wild and difficult for the hunter to approach, and from their firmness and courage a good deal of danger is attendant in shooting them. In height they are generally about three feet and a half at the shoulder, and their colour is a dark brown. The horns are common to the female as well as the male. When they are surprised by the hunter, in the first alarm they commence flighing up their heels, and start about like a frightened horse; but they immediately afterwards take to flight, and career over immediately afterwards take to flight, and career over the plains at a speed which soon out-distances the hunter, who must trust more to take them by strats-gem than by hoping to run them down. When they nunter, who must trust more to sake them down. When they are wounded, they will often turn on their assailant, and attack him with the greatest fury, often besieging him in some mound or tree for days. Before attacking, they first drop on their knees, and then spring upon their foe with immense impetus. It is said that the guu is subject to a sort of eruption on the skin or the gu is subject to a sort or eruption on the sun or other cutaneous disorder, which attacks the different herds at a particular season of the year; and that if domestic cattle become infected with it, it is certain to end in their death. When taken young, the gun is very easily domesticated, and is often adapted to the plough in South Africa.

plough in South Africa.

Goar, gote (Sax. gar).—The domestic gost, according to Cuvier, varies more in size, stature, length and fineness of the hair, than any other animal, with the solitary exception of the dog. Its distinguishing characteristics, from the Linnean system of zoology, are as follows: The horns are hollow, turned upwards, annulated on their surfaces, and knotted in front. There are eight cutting teeth in the lower jaw and none in the upper; and the male is generally supplied with a beard or tutt of hair under the lower jaw. The original stock from which this animal sprung has been discovered by the researches of modern students of original stock from which this animal sprung has been discovered by the researches of modern students of natural history to have been the Ægagrus, or wild gost, which inhabits the mountains of Caucaus and Persia. The domestic gost is one of the most useful of animals to man, and it bears every temperature, from that of the tropics to as far north as Wardhuys, in Norway, where it remains exposed to all the inclemencies of the weather all day, being only sheltered at

night in hovels which are nearly as much exposed as the open fields. In Norway, it feeds on moss and the bark of the fir-tree. The milk of the gost is far richer than that of a cow, and the hair is particularly useful in manufacture. The skin, especially that of the kid, is used for the making of gloves, and the flesh is often eaten, although it is rather coarse,—that of the kid is esteemed quite a delicacy. The condition of the goat in the British islands is much more wild than that of any other of our domestic animals: from its being a courageous and powerful animal, its temper and motions are particularly inconstant, and it roams over motions are particularly inconstant, and it roams over the mountains of Wales as if it had never been domesthe mountains of Wales as if it had never been domes-tioated, although, at the sight of the herdsman, it will be far more quick and playful and show more affection than the sheep, to which it is undoubtedly superior in many instances. The Cashmere goat is smaller than the domestic goat, and is likewise valued for the fine-ness of its Sacce. the domestic goat, and is likewise valued for the fineness of its fleece. This variety is a branch of the Thibet goats, which pasture on the Himalays Mountains, in Hindostan. Both these species have a long outward hairy covering, and beneath this is a fine and beautiful coat of wool. From this wool are made the magnificent shawls which form such an important item in the Asiatic trade. Many attempts have been made to cross the breed of the goat with the sheep, and some very successful results have followed. The Cashmere goat having been bred in with the Merino, a mule has been the result, which partakes of the good qualities of both. The Rocky Mountain goat of North qualities of both. The Rocky Mountain goat of North America is another variety, and ranks next to the Cashmere goat for the excellence of its fleece. (See also ANGORA GOAT.)

GOAT-MOTH (Cossus ligniperda) belongs to the section Lepidoptera nocturna moths, and its family Hepi-It is the largest of European moths, the expansion of its fore wings sometimes exceeding three inches. The colour of the hind wings is brown, with darker variations or mottles throughout the surface; while the fore wings are a dusky white clouded with brown, and varied with black irregular streaks, formbrown, and varied with black irregular streaks, forming a species of network. The thorax is a buff-colour, and the body is of a dark brownish-grey colour, with silver rings round it. The larva is about three inches in length when full grown, and takes three years to arrive at maturity, during which time it incloses itself in a tough occoon, formed of pieces of wood gummed together with a glutinous sort of gum. The larva or caterpillar lives on the wood of the poplar, oak, and aspen, which it perforates in large holes; whence its name of Lightperds.

GOAT-BUKKE. OF NIGHELAR (Caprimulans surrongus)

GOAT-SUCKER, or NIGHT-JAR (Caprimulgus europ is a bird which derived its name from an absurd idea or supposition, that it was in the habit of sucking the or supposition, that it was in the habit of sucking the teats of goats and other animals at night. These birds form the tribe of \*\*Fisirostres nocturns\* of some naturalists, and are closely silied to the swallows and swifts, from which, however, they may be readily distinguished by the largeness of their eye and the softness of their plumage,—characteristics which are common to the generality of night-birds. The bill is short and depressed, and is very broad, with an enormously wide gape, which extends beneath the eyes, and is bounded by long bristles; the tarsi are short, and the toes long and strong: the wings are long and pointed. The goatsuckers are found in all parts of the world, and their habits are nearly identical. They fly about at dusk, in pursuit of moths and beeties; and from the rapidity and elegance of their flight, they are frequently mistaken for swallows. Their colour is plain, but beautifully variegated by being freckled and barred with black, brown, and grey feathers diversely arranged. There are numerous varieties of this bird; as the banded goat-sucker and the crested goat-sucker; but they are all very closely alike. (See Whire-Pools-Will.) of goats and other animals at night. WILL.)

WILL.)
GOBELIN TAPERTRY. (See TAPESTRY.)
GOD (Ger. Gott, Fr. Dieu, Lat. Deus, Gr. Theos) is the name given to the Creator and Sustainer of the universe, the High and Holy One, who is the object of human worship. The term is of Baxon origin, being a contraction of good. The belief in the existence of some being or beings superior to man, on whom he is dependent, and who demands his worship, is so universal that is may almost \$\mathbb{\end{a}}\$ said to be an instinct of

Gog and Magog

our nature. Those who worship many gods are termed polytheists; those who worship one only, monotheists. The department of knowledge which treats of the being, perfections, and government of God, is called theology. Many attempts have been made, by arguments, to prove the existence of one Supreme Being, all-powerful, wise, and good, through whom everything exists. Some of these arguments are a priori, others are d posteriori. "When we argue from the ideas we have of immensity, eternity, necessary existence, and the like, that such perfections can reside but in one Being, and thence conclude that there can be but one Supreme God, who is the cause and author of all things,"—this is an argument a priori. When, on the other hand, like Dr. Paley, we argue from the order and regularity that we observe in the objects of nature around us, that there is evidence of design and of a designer, this is an argument a porterior. Each of these modes of argument, however, is incomplete of itself, and it is only by a combination of the two that we can expect to be able, if, indeed, the imperfection of our present faculties will ever admit of our being able, to prove by arguments the existence and attributes of God. At least we have not been left to such resources, seeing that He has seen meet to give us a revelation of Himself.

Godarners and Godnothers, god'-fu-thers, god'-muth-erz (Ang.-Sax.), the names given to the male and female sponsors of a child at baptism. According to the principles of the Church of England, for every male child two godmothers and one goddsther. Each sponsor must be a baptized person, of full age, acquainted with the Lord's Prayer, Creed, and Ten Commandments, and acquainted with the fundamental truths of Christianity. It was especially enjoined upon sponsors that they should see to the children being instructed in the principles of Christianity. and take care, by admonition and

acquainted with the fundamental truths of Christianity. It was especially enjoined upon aponsors that they should see to the children being instructed in the principles of Christianity, and take care, by admonition and instruction, to enforce upon them the importance of their performing their part of the contract. Practically, however, it has become little more than a mere form, the godfathers and godmothers usually giving little or no heed to the future training of the child. The origin of this institution is very ancient, but the period of its rise is not exactly known. No trace of it occurs in the New Testament, but it was practised in the 2nd century, and was in general use trace of it occurs in the New Testament, but it was practised in the 2nd century, and was in general use in the 4th and 5th. It probably arose from the Church requising replies to the interrogatives put at baptism; and hence, in the case of infants, the necessity of there having some one to answer for them. In the Roman Catholic Church a sort of spiritual relationship is regarded as established by this connection, constituting by the aron law an impediment to martionship is regarded as established by this connection, constituting by the canon law an impediment to marriage between the sponsors and the baptized or the parents of the baptized. In the Presbyterian and other non-episcopal churches the parents stand in the place of sponsors, the father taking upon himself the haptismal vows as to the religious up-bringing of the child.

child.
GOD'S TRUCE (Ger. Gottesfriede, Lat. Trenga Dei, or Treva Dei) is the name of an institution of the middle ages; a means introduced by the Church to check in some measure the hostile spirit of the times, by establishing certain days or periods during which all private feuds were to cesse. It seems to have taken its rise about the latter part of the 10th or beginning of the 11th century. At first the Church forbade all feuds on those days of the week which were specially consecrated by the death and resurrection of Christ; namely, from Thursday evening to Monday morning, and threatened with excommunication any who transgressed that order. Afterwards the period was extended so as to include the whole of Thursday, the whole of the period from the beginning of Advent to iended so as to include the whole of Thursday, the whole of the period from the beginning of Advent to the Epiphany, and certain other times and saints' days. The precincts of churches, convents, and graveyards, were also interdicted from any hostile encounters. Though frequently disregarded, there can be little doubt that these enactments were of much use in these troublous times. By degrees the power of the State came to be scretch to promote peace, and these laws of the Church gradually fell into disuse.

Gog and Magog are two names that occur several

times in the sacred Scriptures. In Gen. x. 2, Magog is mentioned as one of the sons of Japheth; in Ezek, xxviii. xxrix, the prophet is told to set his face "against Gog, the hand of Magog, the chief prince of Meshech and Jubal, and prophesy against him;" and in Rev. xx. 8, Satan is represented as going forth "to deceive the nations, which are in the four quarters of the earth, Gog and Magog to gather them together to battle." Among Christians, the terms have been used as nearly synenymous with Antichrist, and in a general sense to include all nations hostile to Christianity. These names are also employed to Christianity. These names are also employed to designate two huge warlike figures, that adorn the Guildhall of London. Many fables are given of the origin of these worthies; but nothing with certainty is known regarding them, further than that from time immemorial they have been locked upon with pride by the people of London. The old giants, which were of times in the sacred Scriptures. In Gen. x. 2, Mathe people of London. The old giants, which were of wickerwork and pasteboard, were destroyed by the great fire of 1666, and the present ones, which are of stone, were constructed in 1708. They are fourteen feet high.

high.

ORTER, goy-tr (Fr. goitre, probably a corruption of Lat. guttur, the throat), is a preternatural enlargement of the thyroid gland, occasioning a swelling of the throat, which frequently attains a very large size. It is also termed Bronehocele (Gr. bronehoe, the throat, and kele, a swelling), and Derbyshire neck, on account of its prevalence in the hilly parts of Derbyshire. It is, however, in the Alpine districts of Europe, especially Switzerland, Savoy, and Tyrol, that it is chiefly to be met with. It is also common in certain regions of the Andes and Himalayas. It is frequently associated with oretinism (which see). Little is yet known of the nature or cause of this disease. It is endemic, or common to certain regions; but from what peculiarity or common to certain regions; but from what peculiarity of these regions it is owing is very uncertain, though many are inclined to attribute it to a calcareous impregnation of the water. It also occurs hereditarily, independent of endemic influence. It is much more common among females than males, and usually occurs about the age of puberty. It is not of an inflammatory or malignant character, is free from pain, and generally of the natural colour of the skin. At first the tumour is soft and elastic : but as it increases in size, it becomes hard and firm. Its size often becomes so great as not only to be a serious inconvenience, but even to impede respiration and obstruct the voice. The great remedy for this disease is iodine, either administered internally in small doses for a long time, or applied externally, either in the form of an cintment, or of the tineture

either in the form of an cintment, or of the tincture painted over it every night. Generally, if not of long standing, the swelling will in this way be removed. GOIDRESTICES. (See SARGASSUM.) GOID, gold (Sar. gold), symbol An. (aurum); equiv. 197; spec. grav. 193. Pure gold for chemi-cal purposes may be obtsined by dissolving standard gold in one part of nitric and four parts of hydrochloric acid. The solution is diluted and filtered, and evapo-rated almost to drypess. to expel the excess of acid rated almost to dryness, to expel the excess of acid. The remaining salt is then boiled with a solution of The remaining salt is then boiled with a solution of sulphate of iron, which precipitates the gold as a dark bluish-purple powder, which is subsequently washed with water and hydrochloric acid. Gold, in its ordinary metallic form, has a reddish-yellow colour, but when very much extended, it transmits a green light, being purple by reflected light. When pure it is nearly as soft as lead, and is the most malleable and ductile of all metals, but is inferior to many in its tenacity. It does not combine directly with any of the non-metallic alements, except chlorine, bromine. tenacty. It noes not combine unreally with any of the non-metallic elements, except chlorine, bromine, fluorine, and phosphorus. The oxygen acids do not combine with either of its oxides, and the only way in which the chloride can be formed is by dissolving it in which the chloride can be formed is by dissolving it in hydrochloric acid, to which some cxydizing substance has been added, such as nitric acid, chromic acid, or binoxide of manganese. Selenic acid acts upon it by oxidation, its acid being converted into scienious. The hydrated alkalies do not act upon gold, except in a strong current of air, when auric acid is formed, which combines with the sikali. The higher alkaline sul-phides dissolve it in the form of tersulphide. Gold, in Metall.—This important metal occurs in con-siderable apartite; in different parts of the world, more siderable apartite; in different parts of the world, more

siderable quantity in different parts of the world, more especially in Mexico, Peru, Brazil, the Ural Moun-

Gold, Chlorides of

tains, California, Australia, New Zealand, and latterly
in British Columbia and Vanouver's Ialand. It also
occurs somewhat aringly in the rivers of Hungary,
Wicklow, and Walse. As the larger portion of the
gold used by mankind is found in the British possessions, it will be necessary to consider its metallurgy
somewhat fully. Gold is always found in the metallic
state, generally alloyed with silver or tellurium; its
extraction from the ore is therefore a simple matter.
When the metal is disseminated through quartz
pyrites or lead, the ore is pounded, and washed with
a stream of water, which carries away the lighter
portions of sand, leaving the heavy metal behind. It
is further freed from impurities by being amalgamated
with quicksilver, which is afterwards distilled off. In
this state it generally contains from 2 to 10 per cent.
of silver or tellurium. It is further reflued by being
finely granulated and boiled with concentrated sulphuric acid until every other constituent is dissolved
out. Perfectly pure gold—24-carat, or fine gold, as it
is termed—is too soft to be used as ornaments, coins,
vessels, &c.; it is therefore alloyed with one part of
copper to eleven of gold for coning purposes. This is
called standard or 22-carat gold. Jewellery is generally made of 18-carat gold, which contains one quarter
of copper. Gold, by being alloyed, loses much of its
ductility and malleability, but gains in fusibility and
hardness. To gild glass or porcelain, gold-leaf is
made into a paste with turpersine and oil, and laid
on with a brush, which is afterwards heated in a
mullle and burnished. Wood, plaster, and papier mdché are covered with geld-leaf by the intervention of
size or varnish. Metals are gilt either by the use of
gold amalgam, by immersion in a solution of gold, or
by the electrotype process. In gilding by amalgametion, the articles to be gilt are made perfectly chan,
and rubbed over with a brush dipped in nitrate of
mercury and the amalgam: they are then heated to
expel the mer and rubbed over with a brush dipped in intrate of mercury and the amalgam: they are then heated to expel the mercury. Copper articles are often git by immersing them in a solution of an alkaline aurate. Electro-gilding is described under that head. Gold alloys are assayed in two ways, -by rubbing the article on a touchstone so as to make a metallic streak, which is touched with aqua regia, and the effect is compared with that of a similar streak made by an alloy of known composition. By this means an experienced operator composition. By this means an experienced operator can estimate the amount of alloy in any mixture correctly within one per cent. When great exactitude is required, the process of cupellation is resorted to. A mixture of one part of the alloy to be assayed is made with three or four parts of silver and three or four of lead, which is fased upon a bone-ash cupel. The lead carries down the whole of the impurities, excent the silver into the cupel leaving nothing but the except the silver, into the cupel, leaving nothing but the gold, alloyed with three or four times its weight of silver. It is then beaten out and immersed in nitric acid, which dissolves out the silver, leaving the gold pure. The amount of silver used must be at least three times that of the gold, otherwise the silver diffused through the mass would be protected from the action of the nitric acid by the nobler metal. The first of these processes, where the gold is alloyed with the silver, is known as quartation; and the separation of the metals by nitric acid is termed parting. As gold is diffused through nearly all our colonies, as short method of testing for its presence will be useful. The minerals most usually mistaken for it are copper and iron pyrites, which may be easily recognized by their giving off sulphur when roasted on a metallic plate. off sulphur when roasted on a metalic plate. They may, however, contain gold; in which case they should be roasted, powdered, and dissolved in aqua regia with the aid of heat. The solution should be carefully neutralized with carbonate of soda, filtered; and a solution of protosulphate of iron should be added as long as there is a precipitate. The precipitate is fil-tered and washed in nitric acid, and the remaining insoluble matter is the amount of gold contained in the mineral. This may be further confirmed by disthe mineral. This may be further confirmed by dis-solving it in hot aqua regir, neutralizing, and adding a solution of protochloride and perchloride of tin. Or if the gold is generally diffused through the mass of a mineral, it should be powdered fluely and shaken up with a quentity of mercury, which, when poured off and distilled, leaves the gold behind.

Gold, Chichies of, in Chem.—With chlorine,

Gold, Cyanide of gold forms two salts,—the protochloride, AuCl, formed as a pale yellow insoluble substance, when the terchloride is heated to 392° Fahr.; and the terchloride, AuCl, which is made by dissolving metallic gold in aqua regia. The latter salt is very soluble in water and alcohol, forming a yellow or orange solution, according to its strength. It has an acid reaction, and stains the skin purple. Ether dissolves it still more readily, abstracting it from its aqueous solution when mixed with it, and forming a yellow layer on the surface. The thereal solution is the aurum potabile of the ancients. Terchloride of gold is easily reduced by the feeblest deoxidizing agents; its solution should therefore be kept in a dark place. It is greatly used as a toning agent in photography, and cocasionally in medicine. It is capable of forming very distinct double salts with the sikaline chlorides, which are much more stable than the chloride itself. The auro-chlorides of potassium and sodium are much used in chlorides of potassium and sodium are much used in

chlorides of potassium and sodium are much used in photography. Digested with a solution of ammonia, it forms tulminating gold. It is formed by dissolving pure gold in aqua regia, and carefully crystallzing.

GOLD, CYANIDE OF, AND POTASSIUM, in Chem.

The protocyanide is the only cyanide of gold known. It is easily formed by adding a solution of cyanide of potassium to a weak solution of terchloride of gold. It is a lemon-yallow powder, readily soluble in excess of cyanide of potassium, forming the double cyanide of gold and potassium, which is largely used for gilding by the electrotype process.

GOLD LACK. a beautiful ornamental fabric, produced

for gilding by the electrotype process.

Gold Lace, a beautiful ornamental fabric, produced by applying a thin coating of gold to threads of silk. In the original method, a stiff thread was produced, long used for making cloth of gold, &c.; but manufacturers have been enabled to apply gold to flexible thread, by means of recent inventions. The first prothread, by means of recent inventions. The first pro-cess is sometimes called fibre-plating, and has been long known to Eastern and European nations. The mode of making Euglish gold lace in its commence-ment is similar to that adopted by the Hindoos. A bar of silver is roughened and coated with a film of gold; the rod is then drawn out into a wire, and finally twisted round orange-coloured silk thread. For the finer kinds of wire thus made, perforated rubies are used as kinds of wire thus made, perforated rubies are used as dies, and an ounce of metal can be brought to the astonishing length of a mile and a quarter. A piece of this wire, twelve inches long, and finer than a human hair, will sustain a weight of twelve ounces. The pro-cess of costing flexible threads with gold film is called the militial Chamista and manufactures have long cess of coating itextile threads with gold film is called fibre-gilding. Chemists and manufacturers have long tried to overcome the many difficulties which stand in the way of fibre-gilding. Many processes have been tried both by chemical and metallurgical processes; but although it was found easy to attach the gold to the thread, yet the whole was too long in drying, and had too soft a foundation, to admit of burnishing. The brilliancy of gold lace produced by fibre-plating has never been surpassed or even imitated by any of the processes invented. Among the principal methods in never been surpassed or even imitated by any of the processes invented. Among the principal methods in use are the chemical processes of Mr. Albert Hook and Mr. Green, patented in 1853, and that of Dr. Kroning of Stolberg. Electro-metallurgy has not been rendered directly applicable; but by M. Barot's method, the material to be gilt is dipped in a solution of nitrate of silver and ammonia. After remaining two hours, and dried, it is exposed to a current of pure hydrogen gas. A silvered surface is thus produced, which can easily be gilt by the electro-metallurgic process. Grow Mosato.—This term is generally applied to the bisulphide of tin, which has a metallic instre and colour resembling the precious metal. It is also popularly used to denote an alloy of copper and sinc or tin

larly used to denote an alloy of copper and zinc or tin

imitative of gold.

imitative of gold.

GOLD, OXIDES OF, in Chem.—Gold forms two oxides. The protoxide, AuO, is a violet-coloured powder, obtained when a dilute solution of potassa, is mixed with the protochloride: it dissolves in alkalies by forming metallic gold and auric acid, which combines with the alkali. Although it does not combine directly with the oxygen acids, it forms a peculiar compound with hyposulphite of soda, much used in photography under the name of sel d'or. It is regarded as a union of hyposulphite of protoxide of gold with three equivalents of hyposulphite of gold and tin. combines with the alkali. Although it does not combine directly with the oxygen ands, it forms a peculiar but thin membranes are placed between it and the compound with hyposulphite of soda, much used in photography under the name of sel d'or. It is last and finest set consists of goldbeater's aking gold with three equivalents of hyposulphite of protoxide of another set of very smooth and fine calf-skin vallum, gold with three equivalents of hyposulphite of soda. In the same manner it forms a stanuate of gold and tin, riband of gold is first out up into small pieces, each and

much used to impart a purple-red colour to glass and porcelain, under the name of purple of Cassius. Both the compounds named above have been the subject of much discussion; the formule indicated represent the newest theories with regard to their composition. Teroxide of gold, or curic acid, AuO, is a powder of a yellow or brownish colour; it is easily reduced to the notatile tests the avenue as in light. is a powder of a yellow of prowain colour: it is easily reduced to the metallic state by exposure to light. It is insoluble in water, but dissolves readily in nitric, sulphuric, and scetic acids, without forming salts, the oxide being reprecipitated on adding water. It is pre-cipitated by decomposing a solution of terchloride of cold with progressis. The mixture formats of manuals cipitated by decomposing a solution of terchloride of gold with maguesis, the mixture of sursts of maguesis and magnesis formed is boiled with nitric acid, which dissolves the magnesis, leaving hydrated suric acid behind. Under the action of the hydracids it is resolved into the tersalt of the halogen. It forms salts with potash and sods, by dissolving it in the alkali and evaporating in vacuo. There are also said to be two other oxides of gold, AuO, and AuO,, but their properties require investigation. properties require investigation.

two other oxides of gold, AnO, and AnO, but their properties require investigation.

Gond, Sulfitures of, in Chem.—There are two sulphides of gold,—the protosulphide and the tersulphide, corresponding to the oxidez and chlorides; but little is known of their properties.

Goldbeaters are strike a delicate membranous substance used by goldbeaters, and obtained from the large intestine of the ox. This intestine consists of three coats or sheathings,—the intestine consists of three coats or sheathings,—the intestine consists of three coats or sheathings,—the intestine of the ox. This intestine consists of three coats or sheathings,—the intestine of the ox. This intestine consists of the existing of the peritoneal membrane is the one used in making goldbeater's skin. After the intestine has been freed from all greasiness by washing, scraping, &c., it is turned outside in, and allowed to steep for some hours in a tub containing strong alkaline fluor; the peritoneal membrane is afterwards removed, stretched, and dried. In fluishing the process, individual manufacturers have their own processes. A packet of skins properly prepared is costly, but it will bear a great amount of beating without injury. Skins may be used for several months without becoming thinner or weaker. A mould or group of goldbeater's skin, containing about 800 pieces, is valued at £10.

Goldbeatering, the art of reducing gold to the state of pieces, is valued at £10.

or group of goldbeater's skin, containing about 800 s pieces, is valued at £10.

GOLDBEATING, the art of reducing gold to the state of very this leaves, for use in various methods of gilding. On account of the extreme malleability of gold, this art has been practised from very remote times; it is spoken of by Homer, and Pliny states that one ounce for gold was beaten out into 750 leaves, each leaf being four fingers square, or about three times the thickness of the ordinary modern gold-leaf. The ancient Perutivians made very thin sheets of gold; and the art seems to have been practised in India, to judge from the rude is specimens of gilding found at Bangalore, in Tippoo Saib's palace. At the present day, according to experiments which have been made, it has been ascertained that one grain of gold can be beaten out so as to cover 75 square inches; and taking one cubic inch of gold at 4,900 grains, it will be found that the gold-leaf was the \$367,650th part of an inch in thickness, or 1,200 times thinner than ordinary printing paper. The manufacture of gold-leaf is a combined process of rolling and hammering. The gold, which is variously alloyed, according to the colour required, is melted in a small crucible by the heat of a wind-furnace; it is then cast into a mould, so as to form a flat oblong bar about three-quartary of an inch wide and two ounces then cast into a mould, so as to form a flat oblong bar about three-quarters of an inch wide and two ounces in weight. After being annealed, cleaned, and cooled, the bar is transferred to the mill, where, by means of two rollers of polished steel, the gold is so far reduced two rollers of polished steel, the gold is so far reduced that the two ounces are spread out over a surface of 960 square inches, with a thickness of rather more than  $\kappa_{n}^{+}$  th of an inch. Before the introduction of the mil, this part of the grocess was performed with a forging-hammer, and in France the same method is still adopted. After being reduced to the proper thickness, the riband of metal is transferred to the goldbeater. The hammering does not take place on the gold itself.

inch square, and 150 of these are interleaved with an inch square, and 150 of these are interleaved with an equal number of leaves of vellum, about four inches square, each piece of gold being placed in the middle of a sheet. A parchment case, open at both ends, is then drawn over this packet of vellum-leaves, and over this another parchment case, at right angles to the first. The beating then takes place upon a smooth block of marble, strongly embedded beneath, and inclosed with woodwork on every side but the front which is furmarble, strongly embedded beneath, and inclosed with woodwork on every side but the front, which is furnished with a leathern apron to preserve any fragments of gold that may fall out of the packet. Very ponderous hammers, weighing 18, 13, and 10 lbs. respectively, are employed: the heaviest is used at first, and the lighter ones as the gold is beaten thinner. The beating is continued until the one-inch square pieces of gold are expanded to nearly the size of the vellum-leaves; each sheet of gold-leaf is then out into four equal parts, and the 600 pieces so obtained are transferred from the vellum coverings to layers of goldbeater's skin. The whole is inclosed in parchment, and the beating continued with a lighter hammer until goldbeater's skin. The whole is inclosed in parchment, and the beating continued with a lighter hammer until the gold nearly attains the size of the skin-leaves: at this point each sheet of gold-leaf is again cut into four pieces; the 2,400 being too many to be beater in one packet, are divided into three parts, and beaten separately: by three beatings and two quarterings the gold-leaf attains the necessary degree of thinness required. One hundred square feet of gold-leaf thus produced only weigh one cause. weigh one ounce.

weign one ounce.

GOLDEN AGE, gold'-en aij, a time set down in the mytholigies of nearly all countries as having existed at some very remote period of antiquity, when the earth was the common property of all, and produced everything necessary to man without cultivation; when good prevailed and evil was unknown; when the lion laid down with the lamb, the land flowed with milk and honey, and peace reigned supreme. The Greeks and honey, and peace reigned supreme. The Greeks and Romans believed that the earth became gradually de-generated from its first establishment, and that three generated from its first establishment, and that three ages, of gold, of silver, and of iron, were to exist successively, and had existed each in their turn, until the last, at the end of which all things would be changed, and the golden age once more resume its interrupted sway. There seems to be some analogy between this belief and the dream of Nebuchadnezzar in the book of Daniel, and there is no doubt that the idea has been inculcated in the mind of man, in order that he should look forward to a brighter and better state of existence.

GOLDEN BULL. (See BULL, GOLDEN.)

GOLDEN LEGEND (Lat. Aurea Legenda), a work of a Dominican friar, James de Vorsigne, who was born in or about the year 1230, and who became first provincial of his order, and afterwards archibishop of Genos. The Golden Legend consists of a history and description of all the different saints and festivals in the calendar. From the fact of its being more descriptive than critical, it illustrates the religious habits. tive than critical, it illustrates the religious habits of the period better than any other work could have done, and its tenor is rather to inculcate good by example than to convince by metaphysical or philosophical

than to convince by metaphysical or philosophical argument.

GOLDEN NUMBER.—This number, sometimes called the Prime, is that by which any year is numbered in the particular cycle of nineteen years in which it is included. It is said to be so called because it was distinguished in almanaes of former days by being put therein in letters of gold. It is used in determining the day of the year on which Easter falls. (See Easter, Merowice Cycle.) To find the golden number for the

brown, and rump a pale brown, the belly white, and a beautiful yellow stripe runs across the wings, which are principally black, with white edges. Altogether, it is the handsomest bird we have, and as its song is very sweet, the goldfinch is a universal favourite. It feeds on the seeds of various plants, particularly that of the thistle. It is found throughout Europe, but principally in the United Kingdom of England and Ireland. Buffor are of it "that beaute of numera making." Buffon says of it, "that beauty of plumage, melody of Bullon says of it, "that beauty of plumage, melody of song, and sagacity of disposition, are all united in the goldfinch," and if it were not a native bird, it would be much higher prized than it is. Being of very lively habits, the goldfinch can be easily trained both to imitate other birds, and thus be of use as decoy, and to perform all manner of funny tricks for the diversion of its master. "There is a company of goldfinches, linnets, and canaries now exhibiting in London, which



GOLDFINCH.

perform a number of parts and different characters. One appears to be dead, and allows itself to be held up by the tail or leg, without showing any signs of life; another stands on its head, with its claws in the air; a third carries a couple of milk-pails, as if it had been bred up to the occupation; whilst a fourth bears a rifle, and fulfils all the duties of a sentry on guard. Another discharges s little cannon, which it attends to in the capacity of an artilleryman; while yet another in the capacity of an artilleryman; while yet another draws a little carriage along with the greatest facility, in which two of its comrades are seated with the utmost sang-froid." Many anecdotes could be related, if space permitted, of the numerous tricks which these clever little birds are able to perform. The reader is referred to Yarrell's British Birds. (See also FRIM-CILLIDA: )

reterred to larrei's British Birss. (See also FRIN-CILLIDE).

GOLD-RISH (Cyprisus awratus) belongs to the general class Cyprisude, and the section Malacopterygii abdominales, a species of fish distinguished by having the mouth small, formed by the intermaxillary bones, and devoid of teeth, the branchiostegous rays few, and the scales generally of large size. The gold and silver fish, as the gold carp is termed, has been long known in England; it was introduced into this country in the year 1691, from China, of which land it is a native. It is called the gold-fish from the splendid brilliant colour of the membrane which lies immediately beneath the scales. It is completely naturalized in Europe; in Portugal, in fact, it breeds freely in the open rivers. The colours of this fish are very various, some being all gold-colour, whilst others are of a fine bluish-brown or silver hue. When young it is very dark, nearly of a black colour. Sometimes the fins are doubled in the gold-fish, and they often have triple tails. It is not eaten, but valued from the beauty of its appearance. the day of the year on which Easter falls. (See EASTER, MEZONIC CYCLE.) To find the golden number for the year carrent, add I to the date of the year and then divide by 19—the remainder will be the golden number for the year; but if there be no remainder, then 19 will be the golden number. Thus the golden number for the year; but if there be no remainder, then 19 will the the year 1864 is 3, the number which happens to be the golden number. Thus the golden number for the year; leaf adding 1 to the date of the year and dividing the sum by 19.

GOLDTHECK, gold-finish (Sax. gold-fine), (Carduelis selegans), a species of bird included in the general class of Fringillidae, and the gayest in appearance class of Fringillidae, and the gayest in appearance of all our native British birds. Its length from the tail to the tip of the bill is about five and a half inches, and the greatest expansion of the wings is minic inches. The bill is white, tipped with black; the forehead and throat scarlet, the head black, the back

from cricket in affording less violent exercise; and it may be engaged in by the old as well as the young. It is a very ancient game in Scotland, but the exact period of its introduction is unknown. It is played with a ball and clubs, on links or downs. The ball is of gutta-percha, painted white, and about an inch and a half in diameter. The clubs are of various kinds, according as the object may be to send the ball a long or a short distance, to raise it out of an awkward position, &c. The shaft is of considerable length, and is unusily made of hickory or lancewood, while the head position, ac. The shaft is or considerable length, and is usually made of blokory or lancewood, while the head is large and flattened, loaded with lead behind, and faced with horn. Some of them have iron heads for striking the ball in certain positions. The principal clubs are the play-club, putter, spoon, sandiron, and cleek; but sometimes there are several kinds of some of these used by players. The game is played on extensive links, and to increase the hazard of the game, and call forth the skill of the players, it is of advantage that the surface be here and there diversified by knolls, that the surface be here and there diversified by knolls, sandpits, and other obstructions. A series of small round holes about four inches in diameter, and perhaps the same in depth, usually several hundred yards spart, and disposed so as to form a circuit or round, composed probably of six or eight of them; but much depends upon the nature of the ground. The game is proparly played by only two persons; but sometimes there are two or more persons on each side, and then those on one side strike the ball alternately. The object of the game is to drive the ball from one hole into another with the fewest number of strokes, and the nerson who with the fewest number of strokes, and the person who puts in his ball with the fewest number of strokes is said to gain a hole. The match is usually decided by the greatest number of holes gained in one or more rounds. Each person is usually attended by a caddy, or servant, who carries his clubs, assists to find his ball, &c. Golf is a most pleasant and healthy enjoyment, affording not only an agreeable excitement, but abundant healthful exercise in the open air. It demands a very considerable degree of skill to excel in it, requiring some strength of arm for the long distances, and a good eye and fine steady hand for the short ones, with some skill, in order to avoid the hazards or obstructions. Golf is much played on Bruntsfield Links, near Edinburgh, and on the links at Musselburgh, North Berwick, St. Andrew's, Montrose, Aberdeen, &c. with the fewest number of strokes, and the person who Aberdeen, &c.

Aberdeen, &c.
GOLLATH BRETLE, go-li'-ath bee'-ti (Goliathus Druwii), comes under the general fam. of Cetoniida, a class
of coleopterous insects which belong to the Lamellicornes, or Pentamera. This family bontains several
sub-genera; but that which is generally known as the
Goliath beetle is the Goliathus cacious, which is a
native of Africa and South America. This insect is
remarkable for its large size; and, on account of its
beauty and the difficulty of obtaining specimens, it is
much prized amongst collectors. The Goliaths beauty and the difficulty of obtaining specimens, it is much prized amongst collectors. The Goliaths are said to be roasted and esten by the natives of the countries they inhabit, who deem them a great dainty. It is said, also, that sometimes £40 or £50 has been known to be given by entomologists for specimens of this insect, and that even now they fetch generally £5 or £61 The Goliathus polyphemus is another variety of this species, as is also the Goliathus micans, the latter of which changes its colour as it is held in different positions to the light. From the reason already given, of its rarity, not much is known as to the habits of either species of this insect.

GOMEON PALM, go-ma'-to (Saguerus GOMEON PALM, go-ma'-to (Saguerus

of either species of this insect.

GOMATO, or GOMMUTI PALM, go-ma'-to (Saguerus saccharifer, or Areng), a species of palm, found in the Molnocas and Philippines, which supplies abundance of sugar. Palm sugar is generally obtained from the juice which flows out from different palms upon wounding their spathes and adjacent parts. It is commonly known in India by the name of jaggery. The juice of the gommuti palm, when fermented, produces an intoxicating liquid or toddy. In Sumatrs it is fermed neva, and a kind of arrack is distilled from it in Ratavis. From the trunk of this palm, when exhausted permed nevo, and a kind of arrack is distilled from it in.

Batavia. From the trunk of this palm, when exhausted of its saccharine juice, a good deal of our commercial sage is obtained. A single tree will yield from 150 to 200 lbs. of sago. The juice of the fruit is very acrid. The stiff strong fibre known under the name of Gommut, or Ejow fibre, is obtained from the leaf-stalks, and is extensively used is the manufacture of cables 353 and various kinds of ropes.—Ref. Bentley's Manual of

and various kinds of ropes.—Ref. Bentley's Manual of Botany.

GONDOLA, gon'-do-la (Ital.), a peculiar kind of boat used at Venice for the same purposes as cabs and carriages in other cities. They are usually about thirty feet long, five in breadth, and light and elegant in form, having high prows, some of which are of elaborate workmanship and exquisitely carved. About the centre a cabin is erected for the passengers, which is carpeted, hung with curtains, and fitted with stuffed cushions. By the ancient republic a law was passed, ordaining that all these boats were to be painted black and hung with black cloth, except those for the use of foreign ambassadors and for state purposes. The boatmen who navigated these boats were called gondolieri, and were a very important body.

GONG, gong (Ang.-Sax.), a pulsatile musical instrument, used in Asia chiefly to give a national cast to the music, or to awaken surprise and arouse the attention of the auditors. It is of a shallow, circular, concave form, and is made of a composition of silver, lead, and copper, while its tones, which are anything but musical, are produced by striking it with a kind of drumstick, having, head covered with leather.

GONIOMETER, gon-com's-ter (Gr. gonia, an angle; mateur. a measure), an instrument for measuring cateur.

Grumstick, naving, head covered with leather.
GONTOMETER, go-ne-ow-e-fer (Gr. gonic, an angle;
metron, a measure), an instrument for measuring
angles, and especially for determining the angles at
which the planes of crystals are inclined to one
another. The ordinary goniometer is made on the
principle, that when two straight lines intersect one another. The ordinary gonometer is made on the principle, that when two straight lines intersect one another, the opposite angles are equal. This instrument, however, is incapable of giving accurate results, on account of the ordinary minuteness of the planes and frequent irregularity of the fracture. The reflective gonometer, invented by Dr. Wollaston, is the instrument most used by mineralogists. The principle upon which it is constructed depends upon the law of optics, that the angle of reflection is always equal to the angle of incidence. It consists of a brass circle, graduated on the edge, and furnished with an index, by which the divisions can be accurately noted. The circle moves in a vertical plane, and is supported on a stand. To one extremity of the horizontal axis movable pin is attached, having a slit for the purpose of receiving a small brass plate. The crystal to be examined is attached to this plate by means of a piece of wax, so that it may project over the edge of the plate; the pin, which is provided with a vertical and horizontal movement, is then raised or lowered till the reflection of any convenient object above seems to reflection of any convenient object above seems to coincide with some other object beneath. When the goniometer is thus adjusted, the graduated circle is turned until a similar reflection is obtained from the contiguous face of the crystal; the arc which the circle will then have described will be found to be equal to the supplement of the angle formed by the equal to the supplement of the augle formed by the two faces of the crystal. In order, however, to avoid calculation, the supplements of the angles are marked on the limb, and may be read off with considerable securacy by means of the vernier.

GOOD BERLYIOUR, SECURITY FOR (Ang. - Sax.), in Law, consists in a person being bound, with one or more sureties, in an obligation to the crown to behave well or he of good behaviour, either generally or ana-

more sureties, in an obligation to the crown to behave well or be of good behaviour, either generally or specially, for a certain time. If the condition of the said obligation be broken by misbehaviour, the party and his sureties become debtors to the crown for the several sums in which they were respectively bound. A justice of the peace may demand security for good behaviour, according to his discretion, when he sees cause, or at the request of any other person under the queen's protection.

Geom. Chart (Lat. summum bonum), is a phrase

queen's protection.

GOOD, CHIEF (Lat. summum bonum), is a phrase sometimes employed in Phil. to denote that in the prosecution and attainment of which the progress, perfection, and happiness of human beings consist. An inquiry into the chief good is an inquiry into what constitutes the perfection of human nature, the shot of all religion and all philosophy. (See ETRICS.) GOODENIAGEM, good-en-c-u'-s-c-e (in honour of Dr. Goodenough, bishop of Carilele), in Bot., the Goodenia fam., a nat. ord. of Discovitedones, sub-class Corollidora, consisting of unimportant herbs, or rarely shrubs. They are principally natives of Australia and the islands of the Southern Ocean. The species Scavols

## Good Friday

Taccada has a soft and spongy pith, which is employed by the Malays to make artificial flowers and ornaments. By the Malays to make artificial nowers and ornamenta.

Good Farmay is the name given to the Friday before
Easter, the anniversary day of our Saviour's crucifixion. It is termed good as denoting the benefits which
have flowed from Christ's death; and it has been observed as a sacred day from the earliest ages of Chrisserved as a sacred day from the earliest ages of Christianity. In the Roman Catholic church this day is observed with much ceremony. The mass is celebrated, but the elements are consecrated not on this day, but the day before; the pricate and attendants are robed in black, in token of mourning; the usual acclamations and doxologies are omitted; no bell is rung; the altar is stripped of its ornaments; none bow the knee in prayer, because in this way the Jews reviled Christ; the kiss of charity is omitted, because Judas betrayed his master with a kiss. The adoration of the cross, or, as it was anciently called in England, "creeping to the cross," is observed on this day; all the congregation approaching, and upon their knees kissing, a figure of our Saviour upon the cross, placed upon the altar. The offices called Tenebra (darkness) are sung on this day, as well as upon the day preceding and succeeding. It is so called from the lights of the church being for a time extinguished, to symbolize the darkness at our It is so called from the lights of the church being for a time extinguished, to symbolize the darkness at our Lord's cruciffxion; and nearly at the end of the service, and amid solemn silenge, there is a tremendous noise, to denote the rending of the veil of the temple. In the English church Good Friday is also observed with great solemnity, and all business is suspended. A sermon used to be presched at St. Paul's Cross in the afternoon, at which the lord mayor and aldermen attended in their robes. The practice of esting "cross buns" on this day, which is generally observed in England, is a remnant of Roman Catholic times, though it has now no religious import.

Goods and Chattels. (See Chattels.)

though it has now no religious import.

Goods and Chattels. (See Chattels.)

Goods, Finder of. (See Finder of Goods.)

Goods in Communion, in the law of Scotland, are
the movable subjects belonging in common to husband
and wife. They comprehend all the movable property
belonging to either of the parties, except such as have
been given to the wife expressly, excluding her jus
maritis and the wife's paraphernalis, regarding which
there is an implied exclusion of the jus mariti. The
husband has the uncontrolled administration of the
codes in communicy during the subjectance of the nusband has the uncontrolled administration of the goods in communion during the subsistence of the marriage. Formerly, if the marriage had not subsisted a year and a day, or produced a living child, the goods in communion returned to the husband, and wife, or to their representatives, as nearly as might be in the proportions in which they were contributed. If there were no child of the marriage on its dissolution, the goods were divided into twe equal parts, one of which belonged to the survivor, the other to the next of kin of the deceased. If there were children, the division was three-fold, one third falling to the children as

was three-fold, one third falling to the children as legitim. The share of the surviving wife was called jis. relictes; that of the husband's representatives, the dead's part. By 18 & 19 Vict. c. 23 (1855), this was all altered, and the representatives of a wife who predeceases her husband have now no right to suy share of the goods in communion, and no bequest by her can affect these goods. Ref. Bell's Dictionary of the Law of Scalland, by G. Ross, Edin. 1861.

Good-will, in legal or commercial language, denotes the custom of any business or trade,—that interest in it which is sold along with the goods and premises. By disposing of the good-will, the seller binds himself to do everything in his power to advance the interests of his successor in the business, and to recommend him to his customers. It is also usual to specify that the seller shall not enter upon the same business within a certain distance of that which he has sold. Such a contracts good at law, and the party infringing it is contract is good at law, and the party infringing it is fiable in damages.

GOOSE, goose (Sax. gos, Lat. anser), belongs to the order Natatores, Anseres, or Palmipedes, of the general family of Anatides. The following are its

#### Goose

of the body; the tarsi long, the hind toe free, articulated upon the tarsus. The general recognized type of the whole class is the Anser wiveus, or snow-goose of Pennant and Wilson. This bird feeds principally on rushes and insects, and in the antumn on bergies. It is found generally in the barren regions of North America, where it breeds in the most prolife manner. The grey-log, or common wild goose, is the origin of the domestic goose; and, according to Pennant, is our largest species of this family. The heaviest weigh about 10 lbs., their length being 2 feet 9 inches and their extent five feet. The bill is large, and of a flesh-colour tinged with yellow; the back grey; the breast and belly whitiah, tinged with grey or ash-colour; and the wings and fail generally pure white, or at most merely tinged with the grey tint which prevails, more or less, over the whole body. It principally inhabits the sea-shores and marshes of oriental countries, and it rarely advances northward above the latitude of 55°. The tame goose is one of the most useful of birds to man, whether it is considered with tenest to it fields on it. The tame goose is one of the most useful of birds to man, whether it is considered with respect to its flesh or its feathers. The naturalist Pennant writes that they are kept in "vast multitudes in the fens of Lincolnshire; a single person has frequently 1,000 old geese,



GWESE.

each of which will rear seven; so that towards the end each of which will rear seven; so that towards the end of the season he will become master of 8,000. I beg leave to repeat here a part of the history of their economy from my Tour in Scotland, in order to complete my account. During the breeding season these birds are lodged in the same houses with the inhabibirds are lodged in the same houses with the inhabitants, and even in their bed-chambers: in every spartment are three rows of soarse wicker pens placed one above another; each bird has its separate lodge divided from the other, which it keeps possession of during the time of sitting. A person called a gozzard, that is goosehord, attends the flock, and twice a day drives the whole to water, then brings them back to their habitations, helping those that live in the upper stories, without ever misplacing a single bird. The geese are plucked five times in the year; the first blucking is at Lady-day, for feathers and quills: and geese are plucked five times in the year; the first plucking is at Ledy-day, for feathers and quills; and the same is renewed four times more between that and Michaelmas for feathers only. The old geese submit quietly to the operation, but the young ones are very noisy and unruly. I once saw this performed, and observed that goalins of six weeks old were not sparsel; for their tails were plucked, as I was told, to habituate them early to what they are to come to. If the season prove cold, numbers of the geese die by this barbarous custom. When the flocks are numerous, about ten pluckers are employed, each with a coarse apron up to his chin. Vast numbers of geese are driven annually to London to supply the markets; among them all the superannuated geese and ganders (called the 'cagmags'), which by a long course of plucking prove uncommonly tough and dry. The feathers are a considerable article of commerce; those from Somersetshire are esteemed the best, and those from Somersetshire are esteemed the best, and those from Ireland the worst." The Bean-goose (Anser order Natatores, Anseres, or Palmipedes, of the segtum) is a regular winter visitant to England, which general family of Anatida. The following are its country it generally arrives in in October, seldom characteristics:—Beak about the same length as head, covered by a cere or skin; the lower mandible is overed by a cere or skin; the lower mandible is in the fur-countries of North America. When it inferior in size to the upper; nostrils lateral in form and placed towards the middle of the beak, which is otherwise killed in large numbers, with sticks and pierced anteriorly; the legs placed under the centre

Gorilla

on for the winter, during which rigorous season it is one of the principal articles of diet to the inhabitants one of the principal articles of diet to the inhabitants of the fur-countries. The plumage of this bird is generally grey, and in its contour it approaches more closely to the swan (eygnus) than any of the other branches of the family duatides. The Brent goose, or Anser torquatus, is another variety of this tribe, and it is one of the smallest, as well as the most numerous in the British islands. It is a regular winter winter winter to the aboves of our waviting admitting a winter visitor to the shores of our maritime counties, says Yarrell, and it remains with us through all the cold months of the year, its predilection being more for the south and east coast. In the adult male, the bill is black, and only an inch and a half in length; the index more dark because the state of the south and east coast. bill is black, and only an inch and a half in length; the irides very dark brown, almost black; the forehead low, the head small and black; the neek all round black, except a small patch on each side, which is white, but marked with a few regularly-placed black feathers; back, scapulars, wing-coverts, and tertials, dark brownish black, the edges a little lighter in colour; primary and secondary quill-feathers black; the rump black; upper tail-coverts white; tail-feathers black; upper part of the breast black; lower portion of the breast and the belly slate-grey, with lighter coloured margins; vent and under tail-coverts white; legs, toes, membranes, and claws black. This description is taken from Yarrell's Kizetory of British Birds, in which it is membranes, and claws black. This description is taken from Yarrell's History of British Birds, in which it is likewise added that the general length of the Brent goose is twenty-one inches, and the expanse from the carpal joint to the end of the wing thirteen inches. It may be mentioned that the livers of geese are esteemed as great a dainty in the present day as they were amongst the ancient Romans; a dish termed pâte de fois gras being made of them, which is a great favourite with epicures, and consequently high in price.—Ref. English Cyclopeala, section Natural History; Yarrell's History of British Birds. (See also Ganner.)

Goosberrent. (See Ribbs.)

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Goosberrent. (See Ribbs.)

a knot made in the harness of a charlot by Gordius, king of Phrygia, which knot was so intricate as to baffle every attempt to untio it, or even to find out where it hegan or ended. The oracle of the day having declared that he who succeeded in solving the complication should be the conqueror of the world, Alexander the Great determined to effect it if possible. Deliberating that if he failed, his followers would be dispirated, he determined to separate it with his sword, and with one blow he cut the momentous Gordian that the weak fraught with such interest to the and with one blow he cut the momentous Gordian knot, which was fraught with such interest to the whole world. According to Quintus Curtius, he thus fulfilled the oracle or evaded it; but Aristobulus, however, gives a different version of the affair. The expression cutting the Gordian knot has consequently been used by the moderns to signify eluding any difficulty or task by hold or unusual means. The story itself is related in Plutarch's Life of Alexander.

Gorge, gorje (Fr.), in Mil., the name that is given to the entrance of any work, or that part which is open to the rear between the inner extremities of its flanks or faces. Thus the gorge of a ravelin is the space facing

or faces. Thus the gorge of a ravelin is the space facing the main works behind it, between the extremities of the main works beamed it, between the extremities of its faces which meet in a salient angle towards the front; and the gorge of a bastion is that side of the irregular pentagon which forms the outline of the work and lies between the interior extremities of its work and lies between the interior extremities of its flanks, where they join the curtains on either side. The lines formed by the prolongation of the curtains on either side of a bastion to a point in its capital within the interior of the work are called its demi-gorges. It is also the name of a concave moulding used in Arch., and the entrance to a narrow pass or defile between mountains.

GORER, gor'.jet (Fr. gorgette), a small piece of steel armour, intended to protect the neck and throat. It was worn by officers in the army long after the use of armour had been shaudoned.

armour had been abandoned.
GORILLA, go-ril-la (Troglodytez Gorilla), a species of large spe which inhabits Western Africa. It is generally referred by naturalists to the same genus with the chimpanzee, but M. Geoffroy St. Hilaite has endeavoured to establish a separate genus for it. For a great number of years there was a vague tradition, unaubstantiated by reliable evidence, that apes of great size were to be seen on the west coast of Africa.

It was not, however, till 1847 that the gorilla absolutely became known to naturalists. A skull of one of these large apes was sent to Dr. Savage, of Boston, by Dr. Wilson, an American missionary on the Gaboon river; and during the same year Dr. Savage, writing to Professor Owen concerning the gorilla, says, "As yet I have been unable to obtain more than part of a skeleton. It belongs to the Simiade, and is closely allied to the orange proper. It reaches pearly, if not quite, the orango proper. It reaches nearly, if not quite, the height of five feet in the adult state, and is of a large size. I am considerably in doubt in regard to its identity with an animal said to have been known to lockinty with an animal said to have been known to Buffon as a large species of orang-outang, under the name of pongo." Since that period akeletons and skins of the gorilla have not only been received, but also considerable information concerning the animal's habits and mode of living. In M. Du Chaillu's "Explorations and Adventures in Equatorial Africa," there are some very interesting accounts of the gorilla. Considerable doubt has been east over several of the siderable doubt has been cast over several of the statements in the work, but the narrative is considered statements in the work, but the narrative is considered trustworthy by Professor Owen and several of the highest scientific authorities. The points of difference between the gorilla and the chimpanzee are as follows: The gorilla is much longer than the latter animal; the ordinary height of a full-grown male is between 5 feet inches and 5 feet 8 inches, and it is probable that many of the largest size exceed six feet in height. Its strongth is transplayer and its akeleton indicated. many of the largest size exceed six feet in height. Its strength is tremendous, and its skeleton indicates great power in the jaws and limbs. The bony ridges above the eyes are very prominent, and the skull of the male exhibits a large occipital ridge on the top of the head. The brain is small, and the nasal bones project more than in the chimpance: these peculiarities give to the animal a hideous resemblance to the human feet. The internal large and large market fits feet was human face. The jaws and lower parts of the face prohuman face. The jaws and lower parts of the face project very much, and the teeth do not form an unintorrupted serice, as in man. The canine teeth are very
large, and the molers bear a greater proportion to the
incisors; thus again approaching the features of a
human being. It is very broad across the shoulders,
has thirteen pairs of ribs, and approaches nearer to the
human form in the shape of the pelvis than any other
have The legs atthough shorter in proportion than has thirteen pairs of ribs, and approaches nearer to the human form in the shape of the pelvis than any other ape. The legs, although shorter in proportion than those of a man, are longer than those of the chimpanzee. When standing erect, the arms nearly reach the knees. The feet age formed for walking on the ground, and the great toe is a true thumb. The hands are remarkable for their great size and strength, the fingers being short but very thick. The skin of the gorilla is black in colour and covered with dark grey hair, which changes to a tawny brown on the head. The hair is longest on the arms. The face is hairy, but the chest is bare. The mouth is large and wide, and thore is scarcely any appearance of neck. The year are much sunk, and in general the countenance is marked by a ferocious scowl. It is a voracious feeder, its food being crollaviely vegetable; and its belly is very large and prominent. Gorillas are not gregarious in their habits; they generally live on the ground, but spend much of their time in climbing trees in search of food. Their immense strength enables them to defend themselves against beasts of prey. They live in the densest parts of the tropical forests, and are much dreaded by the inhabitants. As yet the gorilla has not been tamed, and it would appear as if it reversions. forests, and are much dreaded by the finabitants. As yet the gorilla has not been tamed, and it would appear as if it were incapable of being so in an adult state. Many stories are told of the gorilla being made to work by the inhabitants in some parts of Western Africa: these narratives are perfectly fabulous. In Du Chaillu's work there is a description of two species of Trotlothese narratives are perfectly fabulous. In Du Chaillu's work there is a description of two species of Troglodytes discovered by himself,—one the koole-kamba, and the other the nahigombouvé, which is smaller than the gorilla, and remarkable for a shelter which it makes with leaves in order to protect itself from the rain. In shape this shelter is not unlike an umbrella. The gorilla is called by the inhabitants ngina or ingeena.—Ref. Transactions of the Zoological Society, vol. iii., and Du Chaillu's Exploration and Adventures in Royatorial Africa.

vol. III., and Dn Chaillis Exploration and Activates in Equatorial Africa.

Gonv Daw, go'-re dow, is a term frequently applied to the dusky red film seen upon the damp walls off cellars, or other moist situations. Its diagreeable and alarming nature is due to the unpleasant fact of its resembling the stains of blood.

#### Goshawk

GOSHAWK, gos'-hawk (Sax. goshafoc, goose-hawk), (Astur palumbarius), is a bird which belongs to the general fam. of the Aulconida, of which it is more or less a type. Its generic characters, according to Yarrell, are a sollows:—Bill short,



THE GOSHAWK.

bending from the base, with the cutting-edge of the ting-edge of the upper mandible produced, — thus forming a festoon; nostrils oval. Wings short, reaching only to the tail-feathers, the fourth quill-fea-ther being the long-est. The legs stout, andthe tarsicovered in front with broad scales. The toes of moderate length, the middle toe being the longest, and the laterals nearly equal in length.
The great distinguishing points between the goshawk and the falcons, are the lobe, or festoon,

and the falcons, are the lobe, or festoon, instead of the sharp tooth on the cutting edge of the upper mandible, and the short and rounded form of the wings. Although inferior in powers to the falcon, the goshawk is the best of the short-winged lawks; but its habits and mode of flying its game are very different,—as it does not swoop, but glides along at a short distance from the ground, in an even line with the bird it pursues. A full-grown female measures from 23 to 25 inches in length; and the males one-third, or sometimes one-fourth less. When adult, the plumage is generally similar. The heak is horn-colour, or bluish-black; the cere and rides yellow; the top of the head, the whole of the back, upper surface of the wings and tail-feathers, of a dark greyish-brown colour; in the female this tint is more of a clove-brown. The upper surface of the tail-feathers is bound with even a darker brown colour; while a band of white, variegated with spots and bars of black, passes over the cere, the cyds, cheeks and car-coverts, the nape of the neck, throat, threast, belly, and thighs. The under tail-coverts are white, the cere, cheeks, and ear-coverts, greyish-brown, forming an elongated dark patch on the side of the head; while the legs and toes are yellow and the claws black. The goshawk is used principally for the pursuit of harse, rabbits, and partiages, on account of its low flight. It is not very eager in huuting its prey. ratio of hares, rabbits, and partridges, on account of its low flight. It is not very eager in hunting its prey, as, if its speed is eclipsed, it sits patiently on a tree and waits for other game to present itself.—Ref. Yarrell's British Birds.

British Birds.

Gospel, gos'-pel (Sax., good news; Gr. to euaggelion), denotes the good news of the coming of Christ, and is, by Christians, employed to signify the whole dootrine of the Christian religion,—more particularly the books containing an account of the life of Christ,—i.e., those of Matthew, Mark Luke, and John, are termed the Gospels. There exist a number of apocryphal gospels, which, however, have generally been rejected by the Church, and which abound with absurd and improbable stories regarding the life of Christ, so as to leave no doubt as to their spuriousness.

## Gossypium

however, not the least shadow of evidence of the record of which it is impossible to ennecive could have passed away. This is only another instance of the way in which men, in order to explain a minor difficulty, are often led to entertain even the wildest hypotheses.

Gossip, god-eip (Sax.), was a name formerly given, in England, to the sponsors at baptism. It is formed from God and siò (affinity), and hence denoted one who was considered to have a kind of spiritual affinity

to another.

To another.

GOSSTRUM, gos-stp'-s-um (Lat. gossipeum, the action plant), in Bot., the cotton plant, a gen. of the nat. ord. Malvacea, or Mallow fam. Several species furnish cotton, which consists of hairs covering the seeds. These hairs upon the seeds, and the occurrence of three leafy bracts, united at their base outside the flower, constitute the distinctive characters of the genus. From the importance of cotton as a raw material, the genus Gossppium must be regarded as one of the most valuable to man in the whole vegetable kingdom. At the present moment (January, 1863) nearly half a million of operatives in Lancashire and the adjoining counties are more or less dependent upon the parcochial and charitable funds, in consequence of the suspension of the cotton trade with Americs. There appear to be four distinct species from which our commercial cotton is derived. Many other so-called species have been described, but they are proour commercial cotton is derived. Many other so-called species have been described, but they are pro-bably mere varieties. The first cotton fabrics were manufactured from the hairs of the species G. herba-ceum, the common cotton-plant of India. The stems are less woody than in other species; hence its specific name, which signifies herbaccous. It is a pretty plant, and rises from eighteen inches to two feet in height during the first year of growth. It is usually cut down annually; but if allowed to grow, it will attain cut down anusulty; but if allowed to grow, it will attain a height of five or six feet, and its branches will become rather woody. All the younger parts of the stem are covered with short hairs, and marked with black spots. The flowers are bright yellow, each petal being marked with a purple spot near the base. The flower is succeded by a fruit, which gradually becomes dry, and then bursts into three or four valves, when the cottonwool is seen issuing from it in all directions. This is the Surat cotton of commerce. The cotton is generally white; but much of that produced in China is of the yellow or tawny colour. becalled to fabric called white; but much of that produced in Collins to the fabric called "Nankeen." G. arboreum, the tree-cotton, is another Indian species, but, unlike the last, it assumes the aspect and dimensions of a small tree, from fifteen to twenty feet in height. The flowers are of a bright red aspect and dimensions of a small tree, from fifteen to twenty feet in height. The flowers are of a bright red colour. The cotton hairs are remarkably soft and silky, and are woven by the natives into a very fine musiin, used for turbans by the privileged religious classes only. G. barbadense is the species which yields all our best cotton. It is called the Barbades, or Bourbon cotton, but does not appear to have been originally a native of the New World. It is a perennial plant, and has a shrubby stem, from six to fifteen feet in height. The flowers are yellow, like those of G. herbaceum, and have a dark spot at the base of each petal. The fruit is capsular, and contains in its interior from eight to twelve black seeds, which, on being freed from the ootton-wool, are found to be destitute of down, unlike those of the preceding species, which are covered with firmly-adhering short hairs. The plant was introduced into Georgia from the Bahama Islands, where it had been grown from seed obtained in the West Indies. In the small American islands which fringe the coast of Georgia from Charlestown to Savannah, Indies. In the small American islands which irrings the coast of Georgia from Charlestown to Savannah, this plant has produced the celebrated Sca-island cotton, which is surrivalled for the length of its staple, its strength, and its silkiness. This cotton, when cultivated in the cooler and drier climates of the hill absurd and improbable stories regarding the life of Christ, so as to leave no doubt as to their spuriousness. The authenticity of the four gospels rests upon the clearest evidence. In the latter half of the 2nd cotton, which is unrivalled for the length of its staple, clearest evidence. In the latter half of the 2nd cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is latter and its silkiness. This cotton, when cultivated in the coest of Georgia from Charlestown to Savannah, this plant has produced the celebrated Sea-island cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the celebrated Sea-island cotton, which is unrivalled for the length of its staple, cotton, which is plant has produced the celebrated Sea-island the celebrated Sea-island cotton, which is unrivalled for the length of its staple, cotton, which is unrivalled for the length of its staple, cotton, which is plant has produced the celebrated Sea-island cotton, which is unrivalled for the length of its staple, cotton, which is plant has produced the celebrated Sea-island cotton, which is plant has produced the celebrated Sea-island cotton, which is plant has produced the celebrated Sea-island cotton, which is unrivalled for the length of its staple, cotton, which is plant has produced the celebrated Sea-island cotton, which is plant has produced the celebrated Sea-island cotton, which is unrivalled to the cotton, which is plant has produced the celebrated Sea-island cotton, which is unrivaled cotton, which is unrivaled cotton, which is unrivalled to the cotton, which is plant has produced

island and Egyptian, these South-American cottons obtain the highest price in the market. Cotton is now extensively cultivated in South Africa, in the West Indies, and in Australia; but it will be long before the supplies from these parts can compete with those from the Southern Confederacy. The seeds of the cotton-plants, after the cotton has been separated from them, being supplied to average visid a fixed city. on being submitted to pressure, yield a fixed oil which may be used for burning in lamps. If examined under the microscope, the cotton hair will be found apparently to consist of two delicate transparent tubes, apparently to consist of two delicate transparent tubes, the bne twisted round the other. If, however, the hair be examined in its young state, it will be found to be an untwisted cylindrical tube. Its changed appearance when it reaches to maturity can be accounted for by the circumstances under which it is developed. As the seeds and hairs grow, the espatles do not appear to expand with equal rapidity; and, consequently, the hair is exposed to pressure on all sides. The result of this is, that the hair collapses in the middle, leaving a half-formed tube on each side. These uncollapsed portions of the hair give it the appearance uncollapsed portions of the hair give it the appearance of a flat ribbon, with a hem or border at each edge, of a flat ribbon, with a hem or border at each edge. The hair does not, however, grow out straight, but, coming in contact with other hairs and the sides of the capsular fruit, it becomes twisted. This twisting is undoubtedly the great fact that makes the cotton hair of value to man. There are many hairs, such as those of the cotton-grass and the Bombaz, which are as long and apparently as strong as those of the Gosspium, but which, failing in this irregularity of surface, are utterly incanable of being twisted into a surface, are utterly incapable of being twisted into a thread or yare. The twisting gives the cotton hair the power of uniting with its fellows, and forming with them a cord strong enough to be woven.

LAGEM a COTA SETONS GROUND TO BE WORD.

GOTHA, ALMANAGE DB, go'-thd, is a celebrated publication which takes its name from the city of Gotha, in Germany, where it is published. It is a small pocket volume, 32mo, containing nearly 1,000 pages, and has now reached the hundredth year of its existeno mas now rescued too indured a year of the stete-ence, the first volume having appeared in 1763. It is chiefly remarkable for the large amount of statistical and political information which it contains, regarding all the different states of the world; and as these are always prepared with care from the most reliable always prepared with care from the most reliable sources, it is received as an authority upon such points. So careful are the publishers to maintain the sharacter of the work, that in many cases the date of printing off is marked at the bottom of a page to show that the editor is not responsible for changes after that time. It is divided into four distinct parts,—Genealogy, Diplomatics, Statistics, and Chronology. The first part gives an account of the reigning and princely families of Europe, with the dates of the birth, marriage, children, &c. of the several members. The diplomatic portion gives a list of the ambassadors, plenipotentiaries, charges d'affaires, &c., with the date of their nomination, of each government; the secretaries, attachés, &c. to the several embassies or legations; and the consuls-general and consuls stationed in all the principal towns. It also gives alist of the various ministers and other administrative authorities of each nons; and the consuis-general and consuls stationed in all the principal towns. It also gives a lists of the various ministers and other administrative authorities of each state, with the date of their nomination, &c.; also the names of the principal military authorities, the highest ecclesiastical dignitaries, and the principal officers about each of the courts, with any important changes that may have taken place in its constitution. The statistical portion gives the superficial area of each of the different countries, according to its general divisions, as counties, provinces, circles. &c.; the number of inhabitants in each of these divisions, according to the latest census; the numbers belonging to the various sects. &c.; the financial condition of each country, its income, expenditure, national debt, &c.; its military condition, the amount and divisions of its army, navy, militia, &c. Under the head of Chronology it gives a list of the principal events that have happened during the year, and which are either of general interest or of historical importance. It was originally printed in German; but when Napoleon I., who exercised a rigid supervision of this small was originally printed in German; but wash rapheon 1, who exercised a rigid supervision of this small publication, became emperor, the language was changed to the French, in which it has since continued to appear. This almanac has the character of being slow to recognize political changes, and for years after

the Revolution, it continued to represent Louis XVII.

the Revolution, it continued to represent Louis Avil. as the religning monarch in France.

Gothic Architecture, goth'ak, the name given to the style of architecture that was adopted by Buropean nations generally during the mediewal ages. By some the term is confined to that form of architecture which the term is confined to that form of architecture which is peculiarly characterized by the pointed arch, while others consider that Romanesque architecture, which is distinguished by the use of the round arch in every form, and from which the pointed style of architecture was gradually developed, should also be included under this appellation. Adopting the latter and more comprehensive view of the subject, we may therefore, consider Gothic architecture to consist of two grand divisions—the Romanesque or round-syched Gothic divisions—the Romanesque or round-syched Gothic consider Gothic architecture to consist of two grand divisions,—the Romanesque, or round-arched Gothic, and the Medieval, or pointed Gothic, to which the term "Gothic" is more particularly applied, and, indeed, generally restricted. The early forms of the round-arched Gothic were based on the architecture that prevailed in ancient Rome about the time of the Christian era, in which the circular arch is a common feature. Prior to the dissolution of the Western empire, and even before the division of the great empire of Rome into the rival sovereignties of the East and West, the churoffes and public buildings that were erected in various parts of Italy, although they were for the most part copies of the old Roman basilicas, began to exhibit new features in the general plan of construction and ornamentation; and as soon as the cessation of the internal strife and the flerce assaults of predatory tribes of northern and central Europe, which preceded the overthrow of the Western empire, again permitted men to turn their attention to the Christian era, in which the circular arch is a common which preceded the overthrow of the Western empire, again permitted men to turn their attention to the development of the arts of construction and decoration, these new features expanded into a distinct style, marked with its own special characteristics, that is now known as Romanesque. (Nes Romanesque Arentracture). Under this style of architecture those known as the Lombardic and Norman styles are properly classed; and the oldest eccleristics buildings in England, such as St. Martin's Church, Canterbury, which was partly rebuilt in the 12th or 13th century, Earl's Barton Church, Northamptonshire, and the naveof Rochester Cathedral, which amptonshire, and the nave of Rochester Cathedral, which ampronsure, and the naveol Kochester Cathedral, which are assigned to the Anglo-Roman, Anglo-Saxon, and Anglo-Norman styles respectively, also belong to this division of Gofnic architecture. During the 11th, and the early part of the 12th century, Gothic architecture was in a state of transition from the first stage to the was in a state of transition from the first stage to the second, round and pointed arches being used indiscriminately and in the cathedrals and churches that were erected in England during this period, such as Canterbury Cathedral, the ruins of Glastonbury Abbey, and the Abbey Church of St. Albans; and in France, nearly to the close of the 13th century, many of the characteristics of the Romanesque and Fointed styles of Gothio architecture are to be seen in juxta-position. Mediswal, or Pointed Gothic architecture, dates from the middle of the 12th century, and is divided, in England, into three distinct varieties, known as the First, Second, and Third Pointed, or, the Early English, Decorated English, and Perpendicular English styles of architecture. The principal characteristics of these styles, and the period of time during which each was successively the prevailing form of Anglo-Cothic architecture, are mentioned elseof Anglo-Gothic architecture, are mentioned else-where. (See RARLY ENGLISH, DECORATED ENGLISH, where. (See Early English, Decorated English, Perpendicular English.) These three styles were all marked by the use of the pointed arch struck from at wo centres, which varied in form, the arches being termed obtuse or soute as the centres were taken within or without the span of the arch. Of the dif-ferent forms of pointed arches that may be obtained ferent forms of pointed arches that may be obtained by varying the position of the centres from which the ourves that form the arch are described, the equilateral arch, in which the centres coincide with the extremities of the span, is considered as the characteristic of architecture that may be termed purely Gothic. During the prevalence of the Third Pointed, or Perpendicular English style, an arch was introduced which is known as the four-centred or depressed arch, being convexed of accuments of circles struck from four being composed of segments of circles struck from four different centres, and having the point of the arch but a short distance above the span. This arch became the characteristic feature of the Tudor style of archi-

Gotha

tecture (see TUDOE ARCHITECTURE); a style which is generally termed by architects debased English, and which was the last passe of Gothic architecture in England, being the prevailing style, especially in colleges and buildings of a private character, until the middle of the 18th century. From this time few, if any, buildings were erected after the Gothic style in this country, until its revival about 1825, which is mainly owing to the endeavours of A. W. Pugin, an architect of considerable eminence in his profession, to restone a tests for Gothic stylistical energials. restore a taste for Gothic architecture, especially in buildings designed for ecclesiastical purposes, that had long lain dormant. Since that time considerable improvement has been effected in the style of our church architecture; and among other public buildings that have been erected in this style may be named that magnificent structure the New Palace of Westminster. A comparison of St. Paul's Cathedral with Westminster Abbey will at once show the superiority of Gothic ster Abbey will at once show the superiority of Gothic architecture over the so-called classic style for churches and cathedrals; although it must be allowed that, except in the case of the new Houses of Parliament, which has just been cited, it is by no means well suited for buildings designed for the public service, or those of a private character. The chigin of the name is involved in obscurity: it has been shown that the architecture of ancient Rome was the parent source from which Gothic architecture was derived; and although it is certain that the settlement of the Ostrogoths and Langobardi, or Lombards, in the north of goths and Langobardi, or Lombards, in the north of Italy must have had a marked influence on Romanesque architecture, by the introduction of elements derived from the structures of northern Europe, it is equally clear that the origin of this style cannot be attributed to these rude nations, whose knowledge of the art of construction must have been as limited as the degree of civilization to which they had then attained. According to Mr. Bloxam, an eminent authority on English ecclesiastical architecture, the term Gothic was introduced by the architects who flourished at the close of the 17th century, to express the inferiority of medieval architecture, according to their notions, to the classic style, which they were then endeavouring to introduce. French Gothic architecendeavouring to introduce. French Gothic architecture, like that of England, is divided into three styles termed Ogival primitif, Ogival secondaire, and Ogival termed Ogival primitit, Ogival secondaire, and Ogival tortiaire, or Flamboyant; corresponding to our First, Second, and Third Pointed styles in their principal characteristics, and the period of time during which they prevailed.—Ref. Bloxam's Gothic Architecture; Brandon's Summary of Gothic Architecture; Fragusson's Handbook of Architecture; Glossary of Architecture.—Parker Ortical ere,-Parker, Oxford. Gothic Language, (See German Language and

LITERATURE.

LATERATURE.)
GOTHS, goths (Lat. Gothi, Gotones, Guttones), the name of an ancient people of Germany, who in early times inhabited the coast of modern Prussia, from the Vistula as far as Braunsberg, or Heiligenbeil. The origin of this people has not been ascertained with any degree of certainty. It is generally believed that they once inhabited Scaudinavia, a belief that is both supported by tradition and by the names of places there. The opinion further is, that they came from the south at a period lone anterior to historic records. They are at a period long anterior to historic records. They are mentioned by Pytheas of Marseilles as inhabiting the shores of the Baltic, about the Frische Haff. They shores of the Baltic, about the Frische Haff. They are afterwards mentioned by Tacitus; but from the time of Tacitus, no more is heard of them until the beginning of the 3rd century, when they are spoken of as a powerful nation on the coasts of the Black Sea. In the reign of the emperor Philippus, they took possession of Dacia, and laid siege to Marcianopolis, the capital of Mesia Secunds, which purchased peace for a large sum of money. A few years later, they again extered Mesia, but retreated before the army of Decius, upon which, however, they unexpectedly Decius, upon which, however, they unexpectedly turned, and completely annihilated, near Philippopolis, at the foot of Mount Hæmus (a.n. 259). The following year they again encountered the Roman army, and ing year they again encountered the Roman army, and defeated it with great slaughter, at Forum Trebonii, in Mœsia; the emperor Decius being among the number of the slain. His successor, the emperor Gallas, induced them to withdraw to their own territories, with a large sum of money. They then seem to have expected the statement of the seem to have expected the seem to have expect

tended themselves more to the eastward, and possessing themselves of a fleet, they sailed against Pityus, which they took, and subsequently Trebitond ahared the same fate. In a second expedition they took Chalcedon, Nicomedia, Nicora, Prusa, Apamea, and Cius. In a third expedition, comprising a fleet of 500 vessels, they landed at Cyzicus, ravaged the coast of Attics, took and plundered Athens, Corinth, Argos, Sparts, and many other places. In 269 they undertook another vast expedition, in which they ravaged Crete and Cyprus, and laid siege to Thessalonics; but they were at length defeated in three separate engagement., by the emperor Claudius, with immense slaughter. They, the emperor Claudius, with immense slaughter. They, however, still continued to harass the Roman frontier, and in 272, the emperor Aurelian was obliged to cede and in 273, the emperor Aurelian was obliged to cede them the province of Dacia; after which, there was a period of comparative peace for about fifty years. In 332, their king, Uraric, crossed the Danuhe; but he was at length defeated, and obliged to sue for peace. In the reign of Valens, they carried on a war with the Romans for three years (367-69), but without any decisive result. About this time internal commotions produced the division of the great Gothic kingdom into the kingdom of the Ostrogoths, or Eastern Gothe, who inhabited the shores of the Black Sea, from the Don to the Dnieper; and the Visigoths, or Western Goths, who occupied Dacia, from the Dnieper to the Danuhe. About 375, the Huns invaded Europe from the east, and the Visigoths implored the protection of the emperor Valens, and leave to settle on the east bank of the Danube, which was granted them. The Ostrogoths being refused admission into the Roman erritory, took refuge in the mountains. The oppression of the Roman governors soon drove the Visigoths territory, took refuge in the mountains. The oppression of the Roman governors soon drove the Visigoths to rebellion, and in the war which ensued, they com-pletely defeated the Roman army at Adrianople, in 378, and the emperor Valeus himself lost his life. They threatened Constantinople, but were unable to take it, and afterwards settled in Thrace and Dacia. They soon became so numerous and powerful, that the court of Constantinople saw no other way of securing itself against their attacks than by making them an integral part of the empire. After many vicissitudes, the Ostrogoths also obtained a settlement in Pannonia and Sciavonia, but not till the destruction of the kingdom of the Huns in 453. The Visigoths, in process of time, obtained a degree of power which excited the alarm of Greece and Italy. In 396, Alario made an irruption into Greece, laid waste the Peloponnesus, and became prefect of Illyria and king of the Visigoths. He invaded Italy about the beginning of the 5th century, and by that measure brought on the destruction of the Roman empire, since Stilicho, the Roman general, could only obtain a victory over Alarie, at Verona, in 408, by withdrawing all the Roman troops from the borders of the Rhine. Alarie bimself soon returned to Italy, and sacked Rome in 408, and soon became so numerous and powerful, that the court at versus, in 403, by windrawing all the Roman troops from the borders of the Ithine. Alsrie bimself soon returned to Italy, and sacked Rome in 409, and again in 410. From Rome, Alarie turned to the south of Italy, where death cut short his victorious career. In 412, the Gotth quitted Italy, the south of Gaul having been given up to them; and after having remained there for a short time they crossed the Pyronees and took possession of a large part of Spain, where Athaulf, the successor of Alaric, was assassinated. His successor, Wallis, assisted the Romans against the Yandals sud Alani, in Spain, and was rewarded with a portion of western Gaul. The succeeding kings of the Goths extended their empire, both in France and Spain, and during the latter part of the 5th century it had reached the highest point of its prosperity, its capital being Toulouse. At that time it embraceed the greater part of Spain, and a large portion of Gaul; but after that time the Goths in Gaul were compelled to retreat before the Franks, while in Spain their our anter that the treaths in Gand were compensus to retreat before the Franks, while in Spain their empire was overthrown, about two centuries later, by the Saracens. After the fall of the Western Roman empire, by the invasion of Odoacer, in 476, the eastern emperor, Zeno, persuaded Theodoric, king of the Ostrogoths, to invade Italy in 489. He was successful, and established the kingdom of the Ostrogoths in Italy. Theodoric regions for thirty, they were and greather Theodoric reigned for thirty-three years, and greatly strengthened his power and extended his kingdom; but, after his death, disputes arose as to his successor, and the country became embroiled in civil dissensions. Justinian, the Eastern emperor, in order to profit by these

## Gourd

disorders, dispatched Belisarius to Italy in 526, who took possession of Rome, and, gaining the admiration of the Goths, was invited to become their king. This, of the Goths, was invited to become their king. This, however, he refused, but held the people in subjection to his master. Totila, a noble Goth, rebelled, and made himself master of southern Italy. He was about to destroy Rome, but listened to the remonstrances of Belisarius, that it would add more to his honour to spare it, and contented himself with dispersing the inhabitants, and repeopling it before the arrival of a fresh army from Constantinople under Narses. Totila fell in battle, and his successor, Theirs, shared the same fate: Italy was reconquered, and the Narses. Totals fell in battle, and ins successor, hereas, shared the same fate; Italy was reconquered, and the Gothic monarchy, established by Theodoric, ceased to exist, 554. The Goths, originally savage and barbarous, had become civilized and enlightened before the time of Theodoric. This prince is much praised for his redesting integrity and love of instinct. The public of Theodoric. This prince is much praised for his moderation, integrity, and love of justice. The public buildings of the city were kept in repair, and overseers were appointed to look after them, and to guard the statues. He was slso distinguished in some degree as a patron of the fine arts, science, and learning. Religious liberty was accorded to all; and there is said to have never been in Italy a better administration than that of Theodoric. The Visigoths were the first of all the German tribes to have a written code of laws, which were the first of all the German tribes to have a written code of laws. which was drawn up in the 5th century, half a century before that of Justinian.—Ref. Smith's Dictionary of

Ancient Geography,
Gourn, gourd (Fr. courge), the common name for a
large cneurbitaceous fruit. (See Parc.) The plant
named Cucurbita Pepo yields the white gourd; C.
maxima, the red gourd, or pumpkin; Lagenaria vulgaris,
the bottle-gourd, often used as a receptacle for fluid;
The Court of the course of the co

maxima, the red gourd, or pumpkin; Lagenaria vulgaria, the bottle-gourd, often used as a receptacle for find; Luffu fatida, the sponge-gourd; and Trichosanthes anguinea, the snake-gourd. The wild gourd of the Old Testament (2 Kings iv. 39) is supposed to have been the bitter cucumber, or colocynth.

GOUT, gow! (Fr. goutle, Lat. gutla, a drop), in Path., is a painful disease of the joints, generally of the feet or hands, and more particularly of the great toes. It cocurs mostly in porsons advanced in life, and who indulge freely in the pleasures of the table; and is hereditary. The attack is usually precoded by a disordered state of the digestive system, and commonly begins by a painful swelling of the first joint of the great toe. It returns at longer or shorter intervals, when it may attack various other parts; but generally the great toe is the chief seat of the disease. Some times the attack comes on without any previous times the attack comes on without any previous warning; but usually, for some days or weeks before, warning; but usually, for some days or weeks before, the patient has been suffering from indigestion, with diminished appetite, flatulence, costiveness, and a general feeling of lassitude and depression of spirits. He goes to bed, perhaps, in tolerable health, and after a few hours is awakened by the severity of the pain in the great toe, or sometimes the ankle, heel, or calf of the leg. The pain resembles that of a dislocated bone, and is attended with the sensation as if cold water was poured over the part; and this is succeeded by chilliness, shivering, and other febrile symptoms. These gradually abate as the pain increases, and it continues usually to the following night, with sometimes, however, a period of intermission during the These gradually abate as the pain increases, and it continues usually to the following night, with sometimes, however, a period of intermission during the day. The pain is of a burning or gnawing character. The next night, after some time of tossing and restlessness, the patient succeeds in falling saleep; a gentle perspiration breaks out, and he awakes to find himself refreshed and the part comparatively free from pain. On examining the limb next morning, it is found to be considerably swollen, the toe red and shining, and the veins of the foot much distended. There are usually a number of subsequent attacks, becoming less and less severe, before what is known as "a fit of the gout" is over; so that it commonly extends over a period of several weeks, or even months. When the fit is over, the system is relieved, and the person feels, both in mind and body, much better than before the attack. At first, a fit of gout occurs only once perhaps in two or three years; but it becomes by degrees more and more frequent, more severe, and of longer duration every succeeding fit. In its progress, various parts of the body become affected, and translations take place from one joint or limb to another; and after frequent attacks, the joints lose

## Grace

their strength and flexibility, and become so stiff as to be deprived of all motion. Concretions of a chalky appearance are likewise formed about the joints; and affections of the kidneys arise from a deposit of the same kind of matter in them. This matter is a compound of trie acid and soda. The fits are more apt to occur in spring or autumn than at other seasons of the year; probably owing to the variableness of the weather at these times. As the fits become more frequent and severe, so the constitutional derangements become more marked and constant. The appetite fails, indigestion is more constant, there is a tendency to costiveness, the mind becomes restless and tendency to controlless, the mind becomes results and irritable, calcareous deposits are formed in the arteries, calculi form in the bladder, and frequently the heart becomes diseased. Such are the general features of what is termed the regular gout; but there are certain other kinds which differ widely from it in their general other kinds which differ widely from it in their general obsracter. In atonic gout, the disease, instead of manifesting itself in the joints, attacks some of the internal organs, as the stomach, when the patient suffers from indigestion, nauses, vomiting, and severe paine; or the thoracic viscers, when palpitations, fainting, and asfirms arise. Betroeedent gout (Lat. podagra retrograda) is when, after the inflammation has occupied a joint, it suddenly disappears and is transferred to some internal part, as the stomach, heart, lungs, or brain, when it may give rise to various fatal disorders. Misplaced gout is when, instead of attacking the joints, the disease proceeds inward, and causes an inflammatory affection of some of the internal parts, with the same symptoms that attend inflamcauses an mnammatory affection or some of the inter-nal parts, with the same symptoms that attend inflam-mation of these parts from other causes. The cause of gout has been shown by Dr. Garrod to be the excess of uric acid in the blood, resulting either from an excessive formation or a checked excretion, for there is reason to believe that this substance exists in very single exaction in the blood seen in perfect health is reason to believe that this substance exists in very minute quantities in the blood even in perfect health. Topical remedies are of little use in gout. If the patient is plethoric, the inflammation is to be reduced by bleeding, purging, a low diet, and sudorifies. The use of colchicum is very beneficial during a fit of gout, but it requires to be used with caution. The great cure of this disease, however, is strict attention to diet and plenty of active exercise. The Scotch cure of "living on sixpence a day and working for it" is based upon the true nature of the disease.—Ref. Dr. Garrod On the Nature and Treatment of Gout.

GOVERMENT, and "en"-en" (Ang.-Nor.), in Pol.,

GOVERNMENT, guv'-ern-ment (Ang. Nor.), in Pol., is a word employed to denote either the particular forms under which a state is governed, the collective forms under which a state is governed, the collective body of its laws, or the person or persons in whom the supreme power is vested. There are three distinct forms of government,—a monarchy, in which the supreme power is in the hands of one person; an aristocracy, in which it is vested in a privileged minority; and a democracy, in which it is exercised either directly or indirectly by the great body of the people. Monarchy, in its abuse, becomes despotism; aristocracy tends to oligarchy; and democracy to cohlocracy, or mob government. The mixed form of government is that which combines all, or at least two, of these forms, and is an attempt to combine the good qualities of each, that which combines all, or at least two, of these forms, and is an attempt to combine the good qualities of cach, and to guard against their evil tendencies. Every government comprises within itself three distinct powers,—the legislative, judicial, and executive. In its legislative capacity, it lays down the laws by which its subjects are to be governed; its judicial power is exercised in deciding, by means of various courts and judges, all questions connected with these laws; and its executive power in carrying out or putting into execution its legislative enactments and judicial facilities. (See AUSTROMAND, DEMOGRAGY, MONARdecisions. (See ARISTOCRACY, DEMOCRACY, MONAR-

CHY, &c.) GOVERNMENT, FEDERAL. (See FEDERAL FOVERN-

MENT.)
GOVERNOE. (See STEAM-ENGINE.)
GRACE, graise (Lat. gratia, Gr. charis), is a term frequently used in Scripture, and by theological writers. In its most general signification, it is employed to denote the love and favour of God, towards mankind, more particularly in his sending his son Christ Jesus to die for sinners. It implies that the git springs from the bounty and liberality of the giver, without any claim or merit on the part of the

# Grace, Days of

recipients. It is also employed to designate the in-fluence of the Divine Spirit upon the mind, by which an individual is brought to receive the truths of Christianity; and hence, when an individual has been brought into that condition, he is said to be in a state of grace. It is also used to signify the gospel dispensation, as dis-tinguished from the legal; as when the apostle Paul speaks of our being "no longer under the law, but under grace." Some theologians assert that there are under grace. Some theologians assert that there are two kinds of grace,—common and special. Common grace they regard as being extended unto all men; special grace as that which is extended only to the special grace as that which is extended only to the clect, and by means of which they are brought unto Christ. Some speak of grace as being irresistible, efficacious, electing, justifying, sanctifying, &c. The nature of grace has been one of the most fruitful sources of controversy in the Church, gaving rise to much bitterness of feeling, and introducing many hair-splitting distinctions, for which there are no grounds in Scaintrea. in Scripture.

GRACE, DAYS OF, in Com., are certain days allowed by custom to be added to the time when a bill becomes due. The number of days varies in different countries: here it is three. Thus a hill drawn on the 7th of January, payable three months after date, is not due till the 10th of April. (See BILL OF EXCHANGE.)

GEACULLARIA, or PLOCARIA, gra-sil-lai'-re-a, in Bot., a species of plants belonging to the nat. ord. Alga, or Sea-weeds. The Gracillaria lichenoides is our com-Sea-weens. The Gracularia accessions is our commercial Ceylon moss. It is nutritive, emollient, and demulent, and may be employed in the form of a decoction or jelly as a food for children and invalids; and medicinally in pulmonary complaints, diarrhos, &c. It is sometimes imported under the name of agar-agar, but Gracillaria spinosa has also been imported under the same name. Both species are largely used in the East for making nutritious jellies, for stiffening purposes, and for varnishing. Gracillaria stiffening purposes, and for varnishing. Gracillaria Helmintho-corton is Corsican moss. It has been used principally as a verminge, but its properties have been much overrated. Gracillaria crassa, or Ki-tsai, is cooked with soy or vinegar in China; and is also used by the Chinace leding for gring and car the thickering. by the Chinese ladies for giving a gloss to theirhair.

Guacioso, grath-e-o'-so (Sp.), is the name given in Spain to the buffoon, who is a very popular personage

Spain to the buffoon, who is a very popular personage on the stage in that country.

GRADINK, grait-de-ent (Lat. gradus, a step), a term applied to the proportionate ascent or descent on any portion of a line of railway; thus an inclined plane four miles long, with a total fall of 84 feef; is said to have a gradient of 21 feet in the mile. In all cases it is desirable in constructing railways to make the road as straight, and with as near an approach to a dead level, as possible. During the early days of railwad-making more importance was attached to this subject than is exhibited now. As late as 1846 Mr. Locke had great difficulty in persuading the French authorities to tolerate inclines with a gradient of 1 in 126. In this country, however, on the Birmingham and Gloucester line, the Tickey incline, with a gradient of 1 in 37, has been for years in successful work; and on the Vienna the inclines are somethines carried been for years in successful work; and on the Vienna and Trieste railway the inclines are sometimes carried for great distances at a gradient of 1 in 40. Steep melines always, however, constitute a heavy burden on the working expenses of a railway, and should never be

the working expenses of a railway, and should never be admitted unless shoultely necessary. (See Railwax.) GRADUAI, grād'-s-āl (Lat., from gradus, a step), in the liturgy of the Roman Catholic church, is applied to the few verses of the Holy Scriptures, generally the Psalms, which are chanted after the reading of the Epistle, in the service of the Mass. It is so called from the priest, during the time, being on the steps of the alter.

The altar, grad'-u-ait (Lat. gradus, a step), is one who has taken a degree at a college or university. The act of conferring degrees is called graduation. (See

DEGREE, UNIVERSITY.)

Gradus and Parmassum, gravi-due and par-nus-aum (Lat., a step to Parmassus), is the name of a class-book used by scholars for assisting them in the composition of Latin verses. The words are arranged in alphabetical order, and the quantities of each marked. The first work of this kind was by the Jesuit Aler, and published at Cologne, 1702.

## Grafting

GRAF, graf (Ger.), a title of nobility which corresponds in Germany with our English count. The first mention of this particular grade of nobility occurs in the 5th century. There are two classes of grafs in Germany at the present time, the first forming a section of the highest and oldest nobility, and the second representing the higher order of the lower nobles.

GRAFFITO, graf, fe<sup>-to</sup> (Ital, a scratching), is the name given to a class of inscriptions which have been found in certain ancient cities, and which have recently excited some interest. They are street scribblings, the names, words, and sentences which are found rudely traced in charcoal or red chalk, or scratching the still so the plactor of the well as will are the with a stylus on the plaster of the walls or pillars in the public places. Many curious and interesting gleanings of them, found at Pompeii and elsewhere, have been made public, and more than one eminent scholar has applied himself to the subject as a special They are not only extremely curious in themstudy. They are not only extremely curious in themselves, but are valuable as tending to throw light on the every-day life and manners of the ancient world. The subjects of this wall literature of the ancients appear to have been very miscellaneous. Many of the inscriptions are of a religious character, others political; but the great majority of them appear to have been personal, and often of a satirical or grossly libellous character. Very many, indeed, hardly admit of any regular classification, being, as might be anticipated of a most mother character. Some are scrapa pated, of a most motley character. Some are scraps of poetry from well-known authors; others are doggrel verses, or short sentences of unknown origin. Some are expressions of affection for a friend, while others denote disapprobation. Many of them, too, are mere ribaldry, sometimes of the grossest and most disgusting tendency. The literary value of the graffiti is, as was to be expected, very slender; but they are interesting as throwing light upon the manners, customs, and modes of thought of the people. A small selection of these writings was published by Dr. C. Wordsworth in 1837; but the most elaborate and interesting work on this subject is the "Graffiti di Pompei," 1856. But by far the most comprehensive and magnificent work on this subject will be, when completed, "Monuments Epigraphica Pompeiana," by Jos, Fiorelli.—Ref. Edinburgh Ecview, October, 1859. are expressions of affection for a friend, while others 1859.

1859.

GRAPTING, grift'-ing (Ang.-Nor.), is a mode of propagating plants which is applicable to most kinds of trees and shrubs, with the exception of heaths and herbaceous vegetables, which do not so easily admit of the operation. It is principally directed towards fruittrees, in order to continue their varieties. A tree which is grafted consists of two separate parts,—the scion and the stock: the union of these two constitutes the graft, and the operation by which the union is effected is termed grafting. According to Loudon, the end of grafting consists—Firstly, in preserving and multiplying varieties of fruit-trees endowed, accidentally or otherwise, with particular qualities, which canmultiplying varieties of fruit-trees endowed, accidentally or otherwise, with particular qualities, which cannot be transferred to their offspring by seeds, and which would be multiplied too slowly or ineffectually by any other mode of propagation; secondly, to accelerate the fructification of trees, barren as well as fruit-bearing; thirdly, to improve the quality of fruits; fourthly, to perpetuate varieties of ornamental trees or shrubs; and lastly, to change the species of fruit on any one tree, and to renew its fruitfulness. Whip, splice, or tongue-grafting, is the mode most generally adopted in nurseries for propagating fruit-trees. It is necessary, in order to perform this correctly, that the top of the stock and the extremity of the scion should be of could diameter. The scion and stock are out off be of equal diameter. The scion and stock are out off be of equal diameter. The scion and stock are out off cobliquely at corresponding angles, or as near the same as the operator can guess; a sit is then made in the sloped face of the stock downwards, and in the scion inwards; the tongue, thus constructed, of the scion is then inserted in the cleft of the stock, the inner barks of both being made to unite closely, and the whole is then bound round tightly with base riband from left to right. The next thing to be done is to clay all round, over the bass, from about an inch below the graft to an inch above, closing up all the apertures, so that no light, wet, or wind, can penetrate; for which object the clay is applied. Cleft-grafting is another variety, and only differs from the above method in the

scion being shaped like a wedge, and being inserted in a corresponding savity in the stack. Budding is another method of grafting by means of the germs or eyes of plants, and it consists in taking an eye or bud attached to a portion of the bark and transporting it to a similar position in another or different ligneous vegetable. The only difference between budding and grafting is in the fact of the scion being in an embryo state instead of being fully grown.—Ref. Loudon's Encyclopadia of Gardening. (See also Gardening, Horneuturues, &C.)

Encyclopadia of Gardening. (See also GARDENING, HORECULFURE, &c.)
GRAIN, grain (Fr. grain, Lat. granum), the smallest weight in the systems commonly used in England and America for denoting the weights of hodies. The value of the grain is set forth in the act of parliament, 5 Geo. IV. c. 74. (See Ayolkdurols.) The grain can 5 Geo. IV. c. 74. (See Ayotanurots.) The grain can be taken as the common unit in comparing the systems of weight known as avoirdupois, apothecaries, and troy. The onnee avoirdupois contains 4375 grains. the apothecaries' and the troy onnee 480 grains. The principal terms of the decimal system of weights may thus be expressed in grains:—

-		Grains.
1	Kilogramme =	15434
1	Gramme =	15 4346
1	Centigramme =	1543
	Milligramme =	0154

A proposition for altering the value of the grain in the British Pharmacopoia was advanced in 1862; but the General Medical Council, after much consideration, determined not to interfere with the well-known weight.

weight.
Grain Tin. (See Tin.)
Grains of Paradier. (See Amomum.)
Grains of Paradier. (See Amomum.)
Grains. Grains. Grail-to-grail-to-freez (Lat.
grailes, stiles), the wading birds, the fourth of the
six orders into which Linneus divided the class Area,
or Birds. The order is thus described by him:—Bill
sub-cylindrical and rather obtuse; tongue entire,
fleshy; feet wading, the thighs half-naked; body
compressed; the skin very thin and sapid; the tail
short. Their food consists of flahes, water reptiles,
and enimalcules obtained in marshes, and their nests and animal cules obtained in marshes, and their nests are generally found near the ground. The families of the order are the Gruide, or cranes; the Ardeida, or the Total the Critical of the American of the American the Scolopacidae, or sandpipers, and snipes; the Rullidæ, or rails; the Charadriadæ, or plovers; and the Tautalidæ, or bices. It comprises all those birds which live both on land and sea, and to which both elements are essential. Those which are essentially aquatic have a short web to their toos; their wings are long, and, having no settled district, they fly from one shore and, naving no section district, they my from one shore to another as the seasons change. Several fossil remains of the families of this order of birds have been found. In the Paris basin, bones of birds referable to the genera Scolopax, Trings, and Ibis, have been found, and in the fresh-water formation of Tilgate Forest, the remains of a wader larger than a heron were found by Dr. Mantell. The fossil footsteps of wading birds, observed by Professor Hitchcock, in the new red sandstone valley of the Connecticut, show that formerly at least seven species of Grallatores existed, varying in

least seven species of Grallatores existed, varying in size from that of a snipe to twice that of an ostrich.—

Ref. American Journal of Science and Arts, vol. xxix.

Grammacze. grām-in-ai-se-e (from Lat. gramen, grass), in Bot., the Grasses, a nat. ord. of Monocotyle-dones, sub-class Glumaczes. Of all the orders in the vegetable kingdom, this is the most important to man, as it affords his principal food, and is eminently serviceable in other respects, by supplying fodder for cattle, sugar, and numerous useful products. As a botanical group, there is none more natural, for the tariations observed in the herbs, shrubs, and arhores. variations observed in the herbs, shrubs, and arbores-cent plants composing it, are of the simplest kind, arising generally from differences in the proportions of parts. The stem of a grass is round, jointed, and comparts. The stem of a grass is round, jointed, and commonly hollow. The leaves are alternate, with split sheaths, terminating above in membranous tongaes or ligules. The flowers are perfect, or unisexual, and grow in bunches (locuste or epikelets), or aingly. There is no true perianth, its place being supplied by imbricated braots (the chaff-scales), of which there are commonly two, called glumes (see first illustration, b, b), placed at the base of the solitary flower, or at the

base of each locusta; rarely, there is only use glume. Occasionally these envelopes are altogether absent. Each flower is also usually furnished with two additional alternate bracts, called pales (a, a, in first flustration); sometimes the inner pales is wanting. There are also, in some cases, two or three scales, called locations, or glumellules, present. The stamens vary in number from one to six, or even more—the number is frequently three (see second illustration e, c, c) the filaments are capillary; the antiers versatile. The overy (a) is superior and one-celled, with a solitary





FLOWER OF THE OAT.

ascending ovule; the stigmas (b,b) are feathery, or hairy. The fruit is a caryopsis. The seed has mealy albumen and a lenticular embryo, lying on one side at the base of the albumen. The form of inflorescence is a point of great importance in the classification of the grasses. The single flowers, or locusts of flowers, may be arranged on a central column (rachis), so as to form a compact head or spike (as in wheat); or they may be placed on a more or less branched axis, so as to form a penicle (as in the oat). Grasses are universally may be placed on a more or less branched axis, so as to form a paniele (as in the oat). Grasses are universally distributed over the globe. In temperate and cold-climates they are herbaceous, and of moderate height, while in tropical climates they become shrubby and arborescent, and sometimes grow to the height of fifty or sixty feet. Grasses usually grow together in large masses, and thus form the vardure of great tracts of soil: hence they have been termed social plants. There soil: hence they have been termed social plants. There are 300 genera and probably about 3,800 species. The most important genera are Triticum, wheat; Hordeum, barley; Anena, oat; Orgua, rice; Zea, Indian corn, ornsize; Secale, rye; Panicum, millet; Saccharum, sigar-cane; Bumbusa, bamboo; Andropogon dactylis, and Holcus. (See these names.)
GRAMMAN, Gram-matike, Lat. grammatica), is the art of grammatic or writing any language with correctness and

speaking or writing say language with correctness and propriety. Considered as an art, it necessarily supposes the previous existence of a language, the object of which is to communicate thought. Without attempting any alteration in a language already in use, it forms to be considered to the control of th it furnishes certain rules, founded on observation, to which the method of speaking adopted in that language may be reduced; and this collection of rules is called may be reduced; and this collection of rules is called the grammar of that language. But apart from gram-mar, as applied to any particular language, there is the pure science of grammar, otherwise called universal grammar, which views language only as significant of thought, and, neglecting particular and arbitrary modi-fications, introduced for the sake of beauty, or other-wise, examines the analogy and relations between words and ideas. Adsiryariable, between those narticulars and ideas; distinguishes between those particulars which are essential to language and those which are only accidental; and thus furnishes a certain standard only scoidental; and thus furnishes a certain standard by which different languages may be compared, and their several excellencies or defects pointed out. "Grammar," says Max Müller, "owes its origin, like all other sciences, to a very natural and practical yant. The first practical grammarian was the first practical grammary and the beginnings of the science of language, we must try to find out at what time in the history of the world, and under what circumstances, people first thought of learning any language besides their own. At that time we shall find the first practical grammar, and not till them. Much may have been ready at hand, through the less discreted, researches of philosophers, and likewise through the critical studies of the acholars of Alexandria, on the ancient forms of their language, as preserved in the Homeric poems. But rules of declension and conjugation, paradigms of regular and irregular nouns and verbs, observations on syntax, and the like; these are the work of the teachers of languages, and of no one else." Grammar, therefore, is of comparatively modern origin. No ancient Greek ever thought of learning a foreign language. It was through the study of the annient dialects of their own language that the Greeks of Alexandria were first led to critical and philological studies. The general outline of grammar existed at an earlier period, but they were the first to study the language critically, analyzing and arranging it under general eategories, distinguishing the various parts of speech, inventing proper technical terms for the various functions of words, &c. The first real practical Greek grammar was that of Dionysius Thrax, a Thracian, who went to Rome, and taught the language there about the time of Pompey. He was the first who applied the results of the labours of former philosophers and critics to the practical work of teaching. His work thus became one of the principal channels through which from Athens to Alexandria flowed back to Rome, to spread from thence over the whole civilized world. We can follow the stream of grammatical science." spread from thence over the whole civilized world. "We can follow the stream of grammatical science," says Müller, "from Dionysius Thrax to our own time in an almost uninterrupted chain of Greek and Roman writers. We find M. Verrius Flaccus, the tutor of the grandsons of Augustus, and Quintilian, in the first century. Scenurs. Application. Dysochus, and his son century; Scaurus, Apollonius Dyscolus, and his son Herodianus, in the second; Probus and Donatus, the teacher of St. Jerome, in the fourth. After Constantine had moved the seat of government from Rome, grammatical acience received a new home in the academy of Constantinople. There were no less than twenty Greek and Latin grammarians who held professorships at Constantinople. Under Justinian, in the sixth century, the name of Priscianus gave a new lustre to grammatical studies, and his work remained an authority during the middle ages to nearly our own times. We ourselves have been taught grammar according to the plan which was followed by Dionysius at Rome, by Priscianus at Coustantinople, by Alcuin at York; and whatever may, be said of the improvements introduced into our system of education, the Greek and Latin grammars used at our public tine had moved the seat of government from Rome, the Greek and Latin grammars used at our public schools are mainly founded on the first empirical analysis of language prepared by the philosophers of Athens, applied by the scholars of Alexandria, and transferred to the practical purpose of teaching a foreign tongue by the Greek professors at Rome."— (Lectures on the Science of Language, 3rd edition, 1862.)
It is in the grammar of a language that we can trace its distinctive features. The English language, for instance, is made up of words borrowed from almost its distinctive features. The English language, for instance, is made up of words borrowed from almost every country of the globe.—Latin, Greck, Hebrew, Celtic, Saxon, Danish, French, Spanish, Italian, German—nay, even Hindusthin, Malay, and Chinese words, lie mixed together in the English distincary; but not a single drop of foreign blood has entered into the organic system of the English language. "The grammar, the blood and soul of the language, is as pure and unmixed in English as spaken in the British isles as it was when spoken on the shores of the German Ocean by the Angles, Saxons, and Jutes of the continent." Grammar is, after all, but decleasion and conjugation. Originally, decleasion could not have been anything but the composition of a noun with some other word expressive of number and case. The like holds true with regard to verbs, though it may seem difficult to discover in the personal terminations of the Greek and Latin the crast-pronouns which were added to the root of the verb in order to express, I love, thou lovest, he loves. It stands to reason, however, that originally these terminations must have been the same in all languages; namely, personal pronouns. "It is very likely," says the author already so frequently quoted, "that the gradual disappearance of irregular decleasions and conjugations is due in literary, as well as in illiterate languages to the dialect of children. The language of children is more regular than our own. I have heard children is more regular than our own. I have heard children is more regular than our own. I worse and worst. In treating of the grammar of any grammar.

language, grammarians usually divide the subject into four distinct heads:—Orthography, or the art of combining letters into syllables and syllables into words; Brymology, or the set of deducing one word from another, and the various modifications by which the sense of any one word can be diversified consistently with its original meaning, or its relation to the theme whence it is derived; Syntax, or what relates to the construction or due disposition of the words of a language into sentences or phrases; and Prosody, or that which treats of the quantities and acceuts of syllables, and the art of making verses. All language is made up of words, which may be defined to be sounds signifrom to fosme idea or relation, and may be distin-guished as—1. Substantives; 2. Attributives; 3. Defini-tives; and 4. Connectives. Substantives are words expressive of things which exist, or are conceived to exist, of themselves, and not as the energies or qualiexist, of themselves, and not as the energies or quanties of anything else. They are noins and pronouns, the latter being a species of word invented to supply the place of nouns in certain circumstances. They admit of the accidents of gender, number, and case. Attributives are words that are expressive of all such things are reconciling to exist not of themselves, but things as are conceived to exist not of themselves, but as the attributes of other things. They are verbs, participles, adjectives, and adverbs. The attributes expressed by verbs have their essence in motion or its expressed by veros have their essence in motion or its privation; and as motion is always accompanied by time, therefore verbs are liable to certain variations called tenes. To denote the several kinds of affirmation expressed by verbs, all verbs have what are termed moods or modes; as the indicative, I write; subjunctive, I may or can write; imperative, write thou. Verbs are also distinguished as active-transitive when the action denoted by them passes from the actor to some external object; active intransitive, when no such passing takes place; passive, such as express not action, but passion or suffering; and neuter, such as express an attribute that consists neither in action nor in passion. Participles are such words as express an attrisuch ratterpes are such words as express an attri-bute combined with time; as, erriting, written. Adjec-tives express, as inhering in their substantives, the several qualities of things of which the essence con-sists not in motion or its privation; as, good, bad, proper. Some qualities are of a such a nature that one substance Some qualities are of a such a nature that one substance may have them in a greater degree than another; and therefore adjectives denoting these qualities admit, in most languages, of variations called degrees of comparison. Adverbs, from being attributes of attributes, have been called attributives of the second order, to distinguish them from verbs, participles, and adjectives, which denote the attributes of substantives, and are therefore called attributives of the first order. Adverbs are of two kinds whose which are converand are therefore cannot attributives of the inst order. Adverbs are of two kinds,—those which are common to all attributives of the first order, i. e., which coalesce equally with verbs, participles, and adjectives, and those which are confined to verbs. Definitives are such words as serve to define and ascertain any particular object or objects as separated from others are such words as serve to define and ascertain any particular object or objects as separated from others of the same class. These are commonly called articles; of which there are two kinds,—the definite and the indefinite. Connectives are such words as are employed to connect other words, and of several distinct parts to make one complete whole. They are of two kinds,—conjunctions and prepositions. Conjunctions are those connectives which are commonly employed to conjoin sentences. They are of two kinds,—conjunctives, or such as conjoin sentences and their meanings too, and disjunctives, for such as, while they conjoin sentences, disjoin their meanings. Prepositions conjoin words which refuse otherwise to coulease; and this they do by signifying those relations by which the things expressed by the united words are connected in nature. Interjections are a class of words which are to be found in perhaps all languages; but they cannot be included in any of the above classes, for they are not subject to the rules and principles of grammar, as they contribute nothing to the communication of thought.—Ref. Encyclopadia Evitamina; Encyclopadia Metropolituna. (See LANGUAGE.)

Grammaria, for the contribute and contribute of honour given to persons accounted learned in any art or faculty whatsoever; but now it is commonly applied to one who is skilled in or who teaches grammar.

#### Grammar Schools

GRAMMAR SCHOOLS. (See SCHOOL.) GRAMMAR SCHOOLS. (See SCHOOL.)
GRAMMS, gram (Fr.), the unit of weight in the
French metric system. At is the weight of a cubic
centimetre of distilled water at its greatest density,
that is to say, at the temperature of 41° of the centigrade thermometer. It is somewhat under 15½ grains,
its exact value in grains being expressed decimally by 15.4346. (See METRIC SYSTEM.)

\*\*Geams. (see Metric Strem.)
Grampis. (See Whale.)
Grandllas, gran-a-div-las (Sp.), the edible fruits
if certain species of passion-flower. (See Passiziona.)
Grand Coutumize of Normandy, koo-koo-a-a, is
the name of an ancient collection of the laws of Northe name of an ancient collection of the laws of Normandy, which formerly prevailed also in this country. It is said to have been compiled in the third year of Henry III. The islands of Jersey, Guernsey, Alderney, &c., which formerly belonged to Normandy, but were united to the English crown by the first princes of that line, are still governed according to the laws of le grand Contumier.

Grand Dars, in Law, are those days in the terms which are solemnly kent in the inns of court and

GRAND DAYS, in Law, are those days in the terms which are solemnly kept in the inns of court and chancery; viz., Candlemas-day in Hilary, Ascension-day in Easter, St. John Baptist's day in Trinity, and All Saints' day in Michaelmas,—all dies non juridict. GRANDER, grân-dec' (Sp. grande de España), is the name of the highest rank in the Spanish nobility. The

name of the highest rank in the Spanish nobility. The collective body of the grandees is called la grandees. To this class belonged that very powerful section of the nobility who, from their great wealth, were called the ricos hombres (rich men). The grandees were originally the descendants of the great feudatories of the crown, and were possessed of many important privileges; among which were exemption from taxation, and from the power of any civil or criminal court. and from the power of any civil or criminal court, without a special warrant from the king. They had also the right of bearing a banner, and of enlisting soldiers on their own account, and might even enter the service of a foreign prince at war with Castile without being guilty of treason. At length Cardinal Ximenes acceeded in breaking their power and dearning them. depriving them of many of their privileges. Subsequently it became the practice of the Spanish kings to raise new men to the rank of grandees, partly with the raise new men to the rains of grainees, party with the view of destroying the power of the ancient nobility, and partly to reward their friends. In this way three classes of grandees areae, differing in rank as well as in the privileges which they enjoyed. Under the government of Joseph Bonaparte the dignities and privileges of the grandees were entirely abolished, but they were partially restored at the restoration. There are very few of the old families now extant in the direct line

Grand Jury, in criminal jurisprudence, is a body of good and sufficient men, whose business it is to examine into the charges of crimes brought before examine into the charges of crimes frought before them at assizes or sessions; and if satisfied that there is sufficient cause, they return a bill of indictment against the accused, upon which he is afterwards tried by the petty jury. The sheriff of every county is bound to return to every session of the peace, and every commission of oger and terminer, and of general goal delivory, twenty-four good and lawful men of the county, to inquire, present, do, and execute all those things which, on the part of the sovereign, shall then and there be commanded them. As many as appear upon this panel are sworn upon the grand jury, to the amount of twelve at least, and not more than twentythree, so that twelve may be a majority. The grand jury are first instructed in the articles of their inquiry by a charge from the judge who presides on the bench. They then withdraw to sit and receive indictments, which are preferred to them in the name of the queen but at the suit of any private presecutor. They are only to hear evidence on behalf of the presecution, for they are only to inquire whether there be sufficient cause to eall upon the party to answer it. They ought, however, to be thoroughly persuaded of the truth of an indictment, so far as the evidence goes, and not to rest satisfied with mere probabilities. The institution of grand juries is very ancient, and can be traced back to the reign of King Ethelred. For grand jurors at assizes, no qualification by estate is necessary; at sessions, the qualification is the same as that of the petty jury. (See Jury.) cause to call upon the party to answer it. They ought 98:

## Granitic Rocks

Grand-Master, a name which was applied, during the middle ages, to the chiefs of the various dominant orders of knighthood; as the Templars and the Hospitallers, the latter of whom were later etermed the Knights of Malta. The grand-master was, in a sort of a way, the sovereign for life of the order which he sommanded, and his word was law in all matters, whether concerning life or death. Bir Walter Soott, in his romance of Ivanhoe, has given a very good sketch of how the post of grand-master was filled and abused by the men to whom it was intrusted. During the days of the ancient monarchy in France, there was an office termed the Grand-Master of France, who was an office termed the Grand-Master of France, who was chief of all the officers of the household; and later, during the empire, there were grand-masters of the ouniversities; but the term has, in the present day, to all practical purposes, exploded. Grand Serbearty (Lat. magnum servitum, great

service), in Law, was a tenure by which the tenuat was bound, instead of serving the king generally in the wars, to do some special bonorary service to him in person; as to carry his banner, his sword, or the like; person; as to carry his banner, his sword, or the like; or to be his butler, champion, or other officer at his coronation. It was of the nature of grand serjeant that it held of the king: the like tenure held of a subject was only knight-service. Tenants holding by grand serjeanty were not bound to pay aid or esouage, as was the case in knight-service. Tenure by cornage, which was to wind a horn when the Scots or other enemies entered the land, in order to warn the king's subjects, was a species of grand serjeanty. This tenure was preserved by 12 Charles II. c. 24, which abolished the other feudal tenures, and still subsists in some cases.

GHANTER, gran'-it (Lat. granum, a grain), in Min., a kind of rock, so named from its granular structure. The typical granite is a crystalline aggregate of the three minerals, felepar, mica, and quartz. The proportions of the three constituents vary indefinitely, with this limitation, that the felspar is always an essential ingredient, and never forms less than a third, rarely less than half of the mass, and generally a still rarely less than half of the mass, and generally a still larger proportion. Sometimes the mice, sometimes the quartz, becomes so minute as to be barely per-ceptible. The state of aggregation of the mass varies also greatly, some granies being very dose and fine-grained, others largely and coarsely crystalline. The grained, others largely and coarsely crystaline. The colours of the rock are generally either red, grey, or white,—the first when the felspar is flesh-coloured, the latter when it is pure white, the intermediate grey tints depending chiefly on the abundance and colour of the mica, but sometimes on that of the quartz. The hard and close-grained granite forms the most durable building-stone for heavy structures; the soft and de-composable yields the finest kaolin, or china-clay. With respect to the granites of Devonshire and Cornwall, which have always maintained a high character for exceeding durability, Sir H. de la Beche remarks : -"There is much good granite on Dartmoor, though it is not always sufficiently accessible to be carried long distances; the chief places where it is worked in large quantities and afterwards exported, are Hey or High Tor, on the east, and near King Tor on the west. The granite from the former places is conveyed by a tramroad to the Stover Canal, down which it is carried in boats, and afterwards down the Teign to Teignmouth, to be shipped for its destination. That from the west side of the Moor is conveyed by the Princestown and Plymouth tramroad to the latter place, and shipped. The continuation of the Hingston Down granite is worked up the Tamer, near New Bridge, and exported from Morwellham. A very hard variety is obtained upon the higher part of the Down, and has obtained upon the higher part of the Down, ann as been employed advantageously for pavements. The chief quarries in the eastern or hard part of the harborough mass of granite are those of the late Mr. Austin Treffry, up the Par Valley, commonly known as Lostwithiel granite. Extensive quarries are there-worked, and the stone is brought to the head of the canal near Pons-mill, upon which it is conveyed to Par Harbour, and there shipped. The Carn Meneiez mass has furnished the granite most commonly known as the Country. as the Cornish. It is nearly altogether shipped at Penryn, where it is brought variable distances from different quarries in the vicinity, many situated in the

2 T 2

#### Granitic Rocks

parish of Mabe. In London, the kerb and paving-stenes parish of Mabe. In London, the kerb and paving-stenes are obtained almost exclusively from the country of Aberdeen. In the district of Peterhead the red granite principally prevails; hence it is commonly called "Peterhead granite." The polished pillars of the Carlton Club, in Pall Mall, are of this granite. Argyleshire also affords excellent granite, and from the island of Mull, which is included in this district, a large proportion of the stone used in the construction of the ion of the stone used in the construction of the Albert Memorial in Hyde Park has been brought. The Albert Memorial in Hyde Park has been brought. The Asle of Man possesses a grey granite; and in Lundy Island, which is almost exclusively of a granitic formation, quarries of a very rich and productive kind have been recently opened. A very large quantity of the stone used in the construction of the Thames Embank. ment has been obtained from these quarries. In Ireland the counties of Wicklow, Carlow, Kilkenny, and Gal-way are occupied by a considerable area of granite. Wicklow granite is extensively used; the variety ob-tained from the neighbourhood of Kingstown being of a hard and coarse character; whilst that quarried at Golden Hill, being of a finer kind, is more used for the purposes of ornamentation.

Grantitic Rocks, grân-it'-ik, & Geol., those igneous rocks which partake of the character and appearance of granite. (See IGNEOUS ROCKS.) They are highly crystalline, and their component crystals are never rounded or water-worn; they present no traces of deposition or stratification; they occur in the earth's crust, as mountain-masses and veins, bursting through and displacing the sedimentay rocks; and they indu-rate, and otherwise alter (as all heated masses do), the rate, and otherwise atter is an inested masses to), the strata with which they come in contact. From these circumstances they are held to be of igneous origin; and as far as geologists have been able to discover, they are the most deeply-seated of all rooks, forming, as it were, the floor or foundation for all the superincumbent formation. As the earliest of the igneous rocks, they are generally found associated with pri-mary and transition strata, tilting them up on their edges, bursting through them in dykes and veins, and variously altering their positions and mineral characters.
Granitic rocks form the principal mass of the most extensive mountain-ranges in the world. The mountains of Cumberland, Devon, and Cornwall, in England, the Grampians in Scotland, the Wicklow mountains in the Grampians in Scotland, the Wicklow mountains in Ireland, the Dofrafelds in Scandinavis, the Alps in Switzerland, the Pyrenees in Spain, the Oural and Himalayan ranges in Asia, the Abyasinian and other ranges in Northern Africa, the hills of Damara and Namqua Land in Southern Africa, the central range of the island of Madagascar, and the Andes in South or the island of Madagascar, and the Andes in South America, are all less or more composed of granitic rocks, or of primary strats, thrown up and altered in mineral character by these granitic intrusions. 'Until recently it was an opinion almost universal among geologists that granite had been formed by igneous fusion, and had solidified from a molten condition under enormous pressure, the theory being supported partly by the crystalline and unstratified character of the rock, but chiefly by the fact that almost every large mass of granite gives off numerous ramifications, or veins, which penetrate the surrounding rocks, and which appear to have been formed by injection of the molten granite into neighbouring fissures. Evidence has, however, accumulated during the last few years, tending to modify this theory very materially. Thus, it has been found that the specific gravity of quarts which has undergone fusion is never higher than 2.3, which has undergone tusion is never higher than 2's, whilst that of the quarts in granite reaches 2's, a fact sufficient in itself to oppose the igneous theory, were it not that the pressure under which granite has evidently been formed must, as Dr. Haughton has pointed out, very considerably increase the density of the silfae. Again, many minerals occurring in granite, either as essential or as accessory constituents, are such as could not have existed at a high temperature; come of them indeed annia as certain varieties of some of them, indeed, such as certain varieties of mics, containing a notable proportion of water. Many of these minerals, moreover, are so highly basic, that it is difficult to understand how they could have been fused in the presence of free quartz without entering into differential combination with the silica. Finally, the constituent materials of granite have, in most cases, not solidified in the order of their relative

# Graphotype

infusibility; the quartz, which is the most infusible, having evidently solidified last, gince it commonly bears the impress of the felspar crystals."—Reference, Ure's Dictionary of Arts, Manufactures, and Mines—Sixth edition; Page's Advanced Text-Book of Geology.

Geology.

Grant, ordat (Nor. granter, to. grant; Lat. concessio), in Law, is strictly a conveyance in writing of incorporeal hereditaments, or of things of which no livery can be had; for all corporeal hereditaments, as lands and houses, were said to lie in livery, and the others, as advowsons, commons, rents, reversions, &c., to lie in grant. The latter, therefore, pass merely by delivery of the deed. By 8 & 9 Vict. c. 106, it is enacted that estates, corporeal as well as incorporeal, may be conveyed by grant; by which means the conveyance of corporeal hereditaments is much simplified. plified.

GRANULATION, gran-u-lai-shum (Lat. granulatio, from granum, a grain), in Surg., is the name given to that process by which small grain-like fleshy bodies form upon the surface of theers and suppurating wounds, and serve for filling up their cavities, and bringing nearer together and uniting their sides. This process is also sometimes called incarnation (from Lat. area commit flesh). Sometimes in weak or un Lat. caro, carnie, flesh). Sometimes, in weak or un-Lat. caro, carms, Hesh). Sometimes, in weak or unhealthy constitutions, granulation proceeds very slowly; at other times it is excessive, rising above the level of the surrounding skin, without showing any disposition to heal, but forming what is popularly termed proud flesh. (See Wounds, Ulcars.) Granulation, in Metal, a process resorted to to obtain metals in a coarse state of division. The metal is melted in a cruisile and noured into water from

is melted in a crucible, and poured into water from the height of three or four feet.

the neight of three or lour leet. Geares. (See VITIS.)
GRAPES. HOT, graip, a kind of shot used against troops advancing in column at a short distance, or, in naval warfare, to sweep the decks of an enemy's ship nava warrare, to sweep the decks or an enemy's snip at close quarters. It consists of a number of balls fastened together, in the form of a short cylinder. The balls wary from ball a pound to four pounds in weight, according to the calibre of the piece from which they are to be discharged. Grape-shot was formerly made by putting the balls into a canvas bag, which was secured to an iron plate, equal in diameter to the calibre of the gun, and having a pin passing through its centre and the bag of shot, about which the balls were secured by cord. This gave the shot in through its centre and the bag of shot, about which the balls were secured by cord. This gave the shot in some measure the appearance of a bunch of grapes; whence its name. The shot are now placed between a series of it on plates, the whole being kept together by pressure, exerted by a nut screwed on to the end of the bolt which passes through them.

General General, graff-ik (Gr. grapho, I write), in Min., a species of granite having the appearance of being covered with letters of an Oriental character, owing to the angular arrangement of the quartz or

felspar it contains.

foispart contains.

Gazerize, grd/~ite (Gr. grapho, I write), is black-lead, a mineral consisting of nearly pure carbon, found in Cumberland, Ceylon, Siberia, Canada, Brazil, and other parts of the world. It occurs in prisand other parts of the world. It occurs in pris-matic masses with a transverse foliated structure, also granular and compact. The finest quality is found at Borrowdale, in Cumberland. It is nearly pure carbon, and is perfectly free from grit. It is used principally in the manufacture of lead-pencils. The coarser quality is used, when ground, for polishing iron-work, for glazing gunpowder, as a lubricator for machinery, and in the manufacture of black-lead melting-pots. (See BLACK-LEAD, PLUMBIGO.) It is used for the lat-ter purpose on account of its unalterability by heat. It is formed artificially during the fusing of cast-iron containing large quantities of carbon. It dissolves in the molten iron, re-crystallizing as it cools, and being often thrown off from the surface of the iron in scales. Professor Brodie, of Oxford, has devised a plan by which the coarsest graphite may be purified. He heats the powdered mineral with sulphuric acid and chlorate of potash, which causes it to exfoliate in an extraordinary manner; a little fluoride of sodium dissolves the silicious impurities, and the whole is well washed in

GEAPHOTYPE, gra'-fo-tipe (Gr. grapho, I write; tupos,

an impression), the name given to rew process of engraving, discovered in 1860 by Mr. de Witt Clinton Hitchcock, an artist of New York. It is a process which enables the artist to become his own engraver. which enables the artist to become his own engraver. Mr. Hitchcock, in a piaper read by him before a meeting of the Society of Arts, describes the incident which led to the invention. Mr. Hitchcock, in the course of making a drawing on boxwood, found it necessary to alter a portion of his design by erasing and re-whitening the exposed surface of the wood. The material used for this purpose was the enamelled surface of an ordinary visiting-card, softened by water and a brush,—a method known to draughtsmen on wood. The card employed happened to be one printed from a copper-plate, and after the removal of all the enameling as described, the artist discovered that the printed ing as described, the artist discovered that the printed letters were undisturbed and standing up in bold relief. In order to carry out the idea which this circumstance suggested, he prepared a slab of chalk, one side of which was made smooth by scraping; upon this smoothed surface he drew with a quilt pen, thing as ink silicate of potash coloured with indige. When the lines of the design became dry he brushed away with a tooth-brush—using no water—all the portions of the chalk surface upon which there were no lines. The lines of the drawing, being literally composed of stone, withstood the action of the tooth-brush, but the intervening portions of chalk gave way and vanished in a cloud of snowy dust, leaving the lines of the drawing standing in bold whief. In order that this design might be printed on paper, it was necessary to harden the block upon which the drawing stood. This was done by saturating the chalk mass with the liquid silicate of potash, or "water-glass." In half an hour the block was printed from in the ordinary way. The process has been improved and elaborated as the reprocess has been improved and elaborated as the result of a great number of experiments, and at the present time it is conducted as follows:—"An artificial chalk block or plate is first produced by grinding the best French chalk to a fine powder with water to a thin cream, and separating the portion which precipitates first, repeating the operation several times in order to insure the complete separation of any hard or coarse particles, drying the very finely-divided chalk thus obtained, and sifting it through wire-cloth having 10,000 holes to the square inch, on to the surhaving 10,000 holes to the square inch, on to the surface of a perfectly smooth plate of zinc, placing a plate of highly polished steel on the top of the even layer of chalk-flour thus obtained, and then submitting it to powerful hydraulic pressure. On removing the pressure and lifting off the steel plate, the chalk is found to be firmly attached to the zinc plate, and to present a perfectly smooth upper surface, which only requires to be 'sized' in order that the ink to be used in drawing on it may not 'spread,' to be ready for the artist. The latter proceeds as in the ordinary method of drawing on wood, first making a red chalk tracing on the block or plate, and then with sable-hair method of grawing on wood, arist making a red chair tracing on the block or plate, and then with sable-hair pencils of various sizes, drawing his design line for line exactly as he wishes it to appear when printed. The ink used is a mixture of glue and lampblack, and The link used is a mixture of kine and manpolack, and dries instantly; so that one series of lines, of whatever thickness, may be immediately crossed by others. The drawing being completed, the portions of the chalk surface intervening between the lines of the drawing, surface intervening netween the lines of the drawing, are disintegrated and removed, to the depth of an eighth of an inch or so by means of brushes, some of them of fitch-hair and others of silk velvet, and the chalk blook is then hardened by being scaked in a solution of an alkaline silicate. A mould is then taken

thrown into the rigging of the hostile ship, in order to fasten the two together, so that the boarding party may rush on the decks of the enemy from their own

GRASSES. (See GRAMINACEE.)

GRASSHOPPER, grass-hop-per, a species of insect common in the British islands and in foreign countries, which belongs to the general family of the Gryllide, which latter come under the class of Orthoptera, and its sub-section Saltatoria, or jumpers. The grasshoppers, like other Gryllide, are characterized by their legs and sub-section Saltatoria, or jumpers. The grassnoppers, like other Gryllides, are characterized by their legs and antennse being very long and slender, the wings large and delicate, and the wing-covers often extending far beyond the extremity of the abdomen. In the male insects these wing-covers are furnished at the base, near the suture, with a round tail-like plate, surrounded by strong ridge-like bands; and the chirping noise peculiar to the family is produced by rubbing the cases of the wing-covers shurply over each other, these ridges serving the purpose of a sort of drum. The common great green grasshopper of this country (Phasgomera Gryllus viridissima) is one of the largest of our naive insects, and measures about two inches in length and three and a half in the expansion of its wings. The field-cricket, or Gryllus compestine of Linnaus, is another species of grasshopper; it is of a black colour, and a little larger than the house-cricket; it frequents dry sandy districts, where it burrows in the ground. The female of this latter insect is said to lay upwards of 300 eggs.

Grass-colls. (See Andropogon.)

to lay upwards of now eight.

GRASS-CILS. (See ANDEOFOGON.)

GRASS-TRIES. (See XANTROBEREE.)

GRASSUM, grid-sum, in Ecots law, is the gross rent
paid in anticipation of possession for a series of years.

This transaction is valid with singular successors where This transaction is valid with angular successors where the yearly rent payable over and above the grassum is not clusory. An heir of entail, prohibited from diminishing the rental, may take grassum, provided the former rent may be continued; but if prohibited against letting below a just rent, grassum is excluded. GRATIOLA, prå.she-o-id (Lat. grasse of God, by Mattitle). The property of the part ord

having been named Gratia Dei, grace of God, by Matthiolus), the Hedge-hyssop, a gen. of the nat. ord. Scrophulariacea. The species G. officinalis possesses purgative, emetic, and directic properties, and was formerly employed in medicine. Its properties are due to the presence of an acrid poison.

GRATLITOUS DEEDS, gratule-stus (Lat. gratuius, free, voluntary), in Law, are instruments made without binding or equivalent considerations.

GRAVEL, (See CLEGUES).

GRAVEL. (See CALCULUS.)

GRAVEL. (See CALCULUS.)
GRAVEL, grav-et (Fr. gravelle), the familiar as well as technical term for accumulations of water-worn rock-fragments, where the pebbles vary from the size of a pen to that of a hen's egg. Accumulations of incr detritus are known as sands, and those of fragments larger than an egg as shingle.
GRAVITATION, grav-i-tait-shau (Lat. gravis, heavy), is a term nearly synonymous with gravity,—which is applied to denote that tendency which all bodies in nature have more or less to approach each other. This force of gravitation varies directly as the masses of the bodies, and is inversely proportional to the of the bodies, and is inversely proportional to the squares of their distances apart from each other. Every particle of matter in the universe has an inclination to assimilate with other particles, and to press inwards; and this is a fact which is proved by eighth of an inch or so by means of brushes, some of them of fitch-hair and others of silk velvet, and the of halk block is then hardened by being soaked in a solution of an alkaline silicate. A mould is then taken from the chalk tlock, and a type-metal cast produced from this mould, and by the ordinary processes of from this mould, and by the ordinary processes of streetyping, and it is the type-metal cast, and not the original block, that is used to print from."—(Mechanica' Magazine.) A type-metal cast may be obtained within three hours after the completion of the drawing upon the chalk surface. This cheap and expeditious process possesses many advantages over wood-engraving, which is a costly and an expensive method.

Gerrel (Fr. grappin), a sort of small anchor with four or five flukes, or arms, used in boats and small vessels and in balloons. Grappels, or grapinging-irons, are likewise brought into action in boarding vessels during marine combats, when they are

#### Gravitation

rentre of the earth. Newton also adds, that as the total force which solicits any given molecule, being the sum of the actions of sach molecule of the attracting body, its intensity will be proportional to the number of molecules contained in the latter. For example, if we suppose that the earth, without undergoing any alteration of its dimensions, were to become more compact by a hundredth part, or, in other words, that within the same volume it contained a hundredth part more matter, then the attractive force which it would more matter; then, the attractive force which it would more matter; then, the attractive force which it would be in-creased a bundredth part. All bodies must necessarily move towards, or in the direction of, the centre of the earth, by the effects of this gravitation, as a sphero always attracts an exterior body in a manner as if all its matter were condensed into a single point at its its matter were concensed into a single point at its centre. From the sxiom that all bodies, when deprived of support, fall from any height to which they may have been clevated, it may be justly inferred that gravity acts upon them during the whole time occupied in their descent with a uniformly accelerating force, which may be proved from the fact, that bodies which fall from a greater height than others arrive at the fall from a greater height than others arrive at the tail from a greater height than others arrive at the earth with a proportionably greater velocity. Galileo was the first who established the fast that the acceleration of all falling bodies is uniform; and he deduced the corollary that the spaces descended through are as the squares of the times of descent. He likewise proved that terrestrial gravity acts equally on all bodies, or, in other words, impresses on all of them an equal quantity of motion, whatever their nature may be. In order to demonstrate this Galileo had several be. In order to demonstrate this, Galileo had several sollow spheres constructed of equal weight and diameter, and in these he inclosed equal weights, formed, however, of different substances; the spheres were then suspended by strings of equal length, and made to vibrate in small ares with a pendulum movement; and it was found the time occupied in describing the are, or the oscillation of each, was equal in all. This may not be clear to all, as light bodies—such as feamay not be clear to all, as light bodies—such as feathers and paper—fall more slowly to the ground than a piece of metal. But it must be remembered that this is due, not to the inequality of the attraction of gravitation, but to the buoyancy of the attraction of gravitation, but to the buoyancy of the attraction of gravitation, but to the buoyancy of the attraction of gravitation, but to the buoyancy of the attraction is properly as in the exhausted receiver of an airpump a feather and a piece of gold, if let fall from the top, will reach the bottom at the same, time, and will descend with perfectly equal speed. That attraction is proportional to the mass, may be shown by the following induction. The variation of a mass, or the attractive force of the earth, becomes apparent by a corresponding variation in the velocity of the falling body. This velocity, which for a short space of time must be supposed uniform, will, in effect, be proportional to the force which generates it. As the force must be supposed uniform, will, in effect, be proportional to the force which generates it. As the force is proportional to the mass, it follows, therefore, that the velocity will also be proportional to that body. In the present day a body in the latitude of Paris falls through 16 1 the feet during the first second of its descent. But if the earth's mass were increased by a hundredth part, as stated before, the space described by the falling body during the first second of time would also be increased in the same proportion, and the valocity, instead of being measured by 16 09 feet, would be expressed by the sum of 10 09 plus 0 16 feet, would be expressed by the sum of 10 09 plus 0 16 feet, or 16 25 feet. The space through which a body falls in or 16:25 feet. The space through which a body falls in one second of time, from the action of gravity, diminishes as the height above the earth's surface increases, is no as the legal above the sain a surface increases, and on the top of a high mountain it is sensibly less than at the level of the sea. The force which generates this velocity, or the attractive force inherent in the molecules of matter, diminishes, therefore, as the distance increases. With regard to the measurements by which scientific men have been enabled to exemplify which scientific men have been enabled to exemplify the principlen of terrestrial gravitation, it must be determined how and what velocity is imparted to a body falling freely in a given time. First, in order to show that gravity is a uniformly accelerating force, Attwood's machine is the best experimental method by which the proof can be deduced. This apparatus consists of a pulley, having a groove on its edge to receive a silken cord which passes over it, and the arrest turns on friction-rollers no as to obtain any stormage turns on friction-rollers, so as to obviate any stoppage in its rotation. To fach end of the string which passes over the pulley, two equal weights are attached, which

#### Gravitation

may be termeder and y. Now these weights counter-balance one another, and no motion whatever ensues; but if another small weight z be attaghed to x or y, so as to give it a preponderance, the loaded weight will immediately begin to descend freely, and its velocity will be diminished in the proportion of the additional weight z, to the sum of the original weights x and y, plus z; for the force which is impressed by the addi-tional weight z is expended not only in giving velocity to itself but elect the two wights a walk which tional weight z is expended not only in giving velocity to itself, but also to the two weights x and y, which are attached to the ends of the string. This machine thus shows that the properties of uniformly accelerated motion hold true in the descent of falling bodies; and if the additional load be such as will be able to carry the weight to which it is added through one foot in the first seconds of time, it carries it through four feet in two seconds, and through nino feet in three seconds; and so on. In order to measure the velocity of descent of heavy bodies falling rapidly, Attwood's machine could not be used with any certainty: the machine could not be used with any certainty; the only mode by which an accurate result can be obtained is by measuring the length of a pendulum, which gives a certain number of oscillations in a fixed time, as there can be no doubt that the number of oscillations there can be no doubt that the number of oscillations which it makes must necessarily depend firstly on its length, and secondly on the intensity of gravity. If the amplitude of the oscillations of the pendulum (see PENDULUM) be very small, in other words, if it does not deviate from a vertical position more than 2°, or 3° at the utmost, the relations between the gravity of the earth and the length of the pendulum will be very simple indeed; as shown by the following theory,—that the square of the number of oscillations performed in a given time is directly proportional to the intensity of gravity, and inversely proportional to the length of the gravity, and inversely proportional to the length of the pendulum. Thus if b is the length of the seconds pendulum,  $\pi$  the ratio of the circumference to the diameter, and g is the accelerating force of gravity (that is, twice the space through which a body falls by the action of gravity in the first second of time), then we have the equation that g equals  $b\pi^2$ . Therefore, as the length of the pendulum vibrating seconds of mean solar time in London in vacuo has been determined to be 39-1393 British standard inches; and as  $\pi$ , or the relation of the diameter to the circumference of a relation of the diameter to the circumference of a circle, is well known to be 314159; then we deduce the relative value of g to be 386.3 inches, or 32½ feet. The length, therefore, through which a hody would fall at London in a second of time would be  $16\frac{1}{16}$ , feet, for half the above quantity. It must be borne in mind, however, that this value of g does not express the whole of the earth's attraction, as a small part of the same (about 1-464th) is counteracted by the centrification for the corresponding to the latitude; g, therefore, was 1 force corresponding to the latitude; g, therefore, gal force corresponding to the latitude; g, therefore, is the force of gravity, diminished by the centrifugal force, or what is properly termed gravitation. It appears from many confirmed experiments, that the variation of gravitating force between the equator and the poles is as 194 is to 195; that is, a body which weighs 194 pounds at the equator, will weigh 195 pounds if transported to the poles. As the variation of the centrifugal force between the same latitudes is expressed by Newton in the fraction  $\frac{1}{16}$ , it follows that the difference between the gravitating force and the centrifugal force and the constitution of the contribution of the contributio rifugal force at the equator and at the poles might be expressed by the fraction  $\frac{1}{\sqrt{2}}$ , which difference arises from the oblate figure of the earth. It hence results, that the variation of the intensity of gravity, or, in other words, the figure of the earth, may be deduced from the number of oscillations that pendulums of the same construction would perform in twenty-four hours in places situated under different latitudes; or it might also be determined from a comparison of the different lengths which must be given to a pendulum in order that it may perform in every place the same number of oscillations in a given time. So far for the different measurements of terrestrial gravity; the second and more important portion of the article comes under the head of Universal Gravitation. Alcomes under the head of Universal Gravitation, Al-though Kepler made some shrewd guesses at the mo-tions of the planets and the causes of tides and other similar phenomens, it is to Sir Isaac Newton that we are indebted for the principles and applications of universal gravitation, and through it, by means of pure geometry (see Geometry), we are able to possess the

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correct information that we have with regard to the movements of the earth, sun, and moon, and other heavenly bodies. The first rule is one which is very heavenly bodies. nesventy bodies. The first rule is one which is very comprehensive, and which gives a good idea of the whole basis of the science; it is, that the attraction of one body upon another body does not depend upon the mass of the body which is attracted, but is the same whatever be the mass of the body so attracted, provided the basis of the body so attracted, provided the same of the body so attracted. whatever be the mass of the body so attracted, provided that the distances be the same. For instance, the planet Jupiter attracts the sun, and also attracts the earth; but although the sun's mass is 300,000 times that of the earth, yet the attraction of Jupiter on the earth is exactly equal to his attraction of the sun, because the earth and sun are equally distant from Jupiter. One of the simplest illustrations of this force is that of throwing a stone in a straight or horizoutal plane, when the stone's course will be evolved in a curve, and the stone at length will drop to the ground. The flights of shot and shells are likewise illustrative of the same rule. (See Gunnery.) Newton, before applying his theory of universal gravitation, sought for a law by which he could regulate the diminishing intensity of the same, and, after several experiments and calculations, he laid down the rule that the force of gravity diminishes exactly as the square of the distance increases, or, in other words, that the attractive force of the earth at the distance of the moon must be as much less than it is at the surface of the earth, sathe square of the radius of the earth is less than the square of the moon's distance from the earth. Newton also found, that since the from the earth. Newton also found, that since the true diameter of the moon is to the true diameter of the earth as 100 is to 365, the mass of matter in the moon is to the mass of matter in the earth in the pro-portion of 1 to 39,788; and also that the accelerative gravity on the surface of the moon is to the accelerative gravity on the surface of the earth, as I is to 3, or is just one-third of that of the earth. He also proved that bodies moving under an attractive force which diminishes according to the inverse square of the distance, must describe conic sections (which see), having a focus at the centre of force; and also that they must conform to the laws of motion which Kepler discovered to belong to the planetary orbs. Newton likewise was successful in determining that most of the inequalities of the moon and planets are consequences of the mutual gravitation of the different bodies which compose the various systems upon each other; and in addi-tion, that the same incomprehensible power not only regulates the motions of the different planets and satellites, but also causes the precession of the equinoxes, produces the tidal action, and determines the figure of the earth. Gravitation, as applied to the celestial bodies, when we consider its effects, enables us to form many conclusions as to its nature, mode of action, form many conclusions as to its nature, mode of action, and influence. We see that gravity is a force which is trausmitted from body to body instantaneously, and not successively; for were we able to measure its transmission, that is, if we consider it in the light of being transmitted auccessively, we would find that the seemlar variation of the mean lunar motion would be secular variation of the mean lunar motion would be sensibly affected. If we consider the question whether gravity is affected by the density of the bodies through which it has to pass in order to attract other bodies, we would be forced to agree with Laplace, that it is of so subtle and all-powerful a matter or force that not even the densest bodies in the universe can offer any obstacle to its free passage, or retard its effects on the body to be acted upon. In concluding the subject, it may be said that if the earth's flattening at each of its poles were greater or less than 1-300th of its diameter, then the effect of this alteration on the moon would, in changing the position of its fundamental plane, thus produce an inequality in the longitude greater or less than 8', by which the moon is sometimes before or bekind her mean place. And, consequently, the deduction can be drawn, that by observing the moon, the oblateness of the earth can be discovered. As this theory has been found to be true and just in its foundation, it is one of the most striking testimonies of the correctness of Newton's laws of universal gravitation.—Ref. Newton's Principle; Arago's Astronomy, &c. &c.

GRAVITY, CENTER OF. (See CENTRE OF GRAVITY.)

GRAVITY, SEECIFIC. (See SPECIFIC GRAVITYES.) obstacle to its free passage, or retard its effects on the

GRAYLING, gray'-ling (Ang.-Sax.), (Thymellus oulgaris), is a fresh-water fish of the family of the Salmonida, and very like the Grout in labita and appearance. Its bedy is long and flat, and seldom exceeds eighteen inches in length. The head is small, pointed, and flattened at the top. The back and sides are silvery grey in colour (whence the name), but when the fish is fresh caught, this colour is seen to be variegated with blue, gold, green, and black spots. The grayling is very abundant in England, Sweden, Lepland, and Norway, and it partakes of the neusl characteristics of the rest of the Salmonida, although it in season generally when they are out. (See Balmonidae.) SALMONIDER.)

SALMONIDE.)

GRAY'S INN. (See INNS OF COURT.)

"GRAYA INN. (See INNS OF COURT.)

"GREAT GO," AND "LETTLE GO."—Terms current
in Oxford, expressive of two different examinations
which students for the degree of B.A. have to pass in
order to obtain the same. The "Little Go," or Responsions, as the examination is termed in the calendar,
must be passed before the fifth term of residence in
the projective, but in most of the college and the university; but in most of the colleges men are required to pass it very shortly after taking their residence in the university, in their first or second term. If the candidate be "placked" (as is the technical phraseology for having failed) three times in his "little go," he is generally obliged to leave his college, and "migrate" to a "hall." Under the new system, the first public examination, or Moderations, is held from the eighth to the twelfth term, and the second public examination, or "Great Go," can be passed between the thirteenth and eighteenth terms of residence; and, being successful in the examination, the student assumes the degree of B.A.—Further information on these names, examinations, and subjects required for degrees, will be found under the articles DROBER and UNIVERSITIES.

GREAT SEAL, grait scal (Ang.-Sax.), is the exarequired to pass it very shortly after taking their resi-

GREAT SEAL, grait seal (Ang.-Sax.), is the em-GREAT SEAL, grant seal (ABE, SMAX), is the emblem of sovereignty, introduced by Edward the Confessor, and appended to all writs to summon parliament, treaties with foreign states, all public acts of state which concern the United Kingdom, and all patents and other matters relating to England. By art. 24 of the Union between England and Scotland (5 Anne, c. 8), it was provided that there should be one great seal for the united kingdom of Great Britsin, great seal for the united kingdom of Great Britain, which should be used for sealing writs to summon the parliaments and for sealing all treaties with foreign states, and all public acts of state which concern the united kingdom, and in all other matters relating to England, as the great seal of England was then used; and that a seal in Scotland should be kept and made and that a seal in Scotland should be kept and made use of in all things relating to private rights or grants which had usually passed the great seal of Scotland, and which only concern offices, grants, commissions, and private rights within Scotland. On the union of Great Britain and Ireland, no express provision was made by any article of that union as to the establishment of the seal made by any article of that union as to the establishing of one great seal for the united kingdom. But various acts (as the summoning of parliament, &c.) are required to be done under the great seal of the united kingdom, and others under the great seal of freland; and by sect. 3 of the Acts of Union, 39 & 40 Geo. III. c. 67 (British), and 40 Geo. III. c. 38 (Irish), it is enacted that the great seal may, if his majesty shall so think fit, after the union, be used in like manner as before the union (areant, where it is otherwise. shall so think fit, after the union, be used in like manner as before the union (except where it is otherwise provided by the articles of union), within that part of the United Kingdom called Ireland. Forging the great seal is treason, punishable by transportation (now penal servitude) for life, GREAVES, greecs (Sp. and Port. grevas), pieces of armour used at a very early period to defend the leg between the knee and the ankle. They formed a part of the armour of Eastern nations in the time of Sanl, as a leason from the stowy of Golisth of Sath the

of the armour of Eastern nations in the time of Saul, as we learn from the story of Goliath of Gath, the champion of the Philistines, who "had greaves of brass upon his legs." The Greeks and Romans also were metal greaves. The Saxons protected the leg by bands of cloth, the Danes by pieces of thick leather. At the time of the Conquest, armour for the legs consisted or hose, on which scales or rings of metal were fastened. When platetamour cames into use, the greaves consisted of plates of polished seed, covering the fore part of the legs. The metal shim-

#### Grebe

piece still forms a part of the picturesque dress of

the Albanians.

GERBE, grebe (Afg.-Sax.), a bird which belongs to the order Natatores, and its sub-section Columbide.

Varrell remarks, with regard to the class: "Of the true divers among our British birds, the grebes and dabchick abelong; to that division which more particularly frequent fresh water; and the great created grebe, the largest of the genus, is resident all the year in several parts of this country which afford reeds and other luxuriant aquatic vegetation, in which they find the required sequitive. They bread and remain all the required security. They breed and remain all the year, or by far the greater part of it, on some of the lakes of Wales, on the meres of Shropshire and Cheshire, on the broads of Norfolk, and in the fens of Lincolnshire. They are seldom seen to fly or walk, being mostly in the water. The form of the whole They are seldom seen to fly or walk, being mostly in the water. The form of the whole bird being that of an elongated cone, is admirably adapted for diving, and their habits can only be observed by those who live in the vicinity of their favourite pools." Besides the great crested grebe, there are the red-necked grebe, the Sclavonia, the tippet, the kittle, the korned, the cared, the dusky, and the blook-ckin grebe. The generic characters of all are, however, very similar, and are as follows:—Bill of moderate length, straight, hard, slightly compressed and over, very similar, and are as folfows:—Bill of moderate length, straight, hard, slightly compressed and pointed, forming an elongated coue; nostrile lateral, concave, oblong, open in front and perforate, closed behind by a membrane; legs and feet long, attached behind the centre of gravity; tarsi very much compressed; three toes in front, one behind; anterior toes very much flattened, united at the base, surrounded by an extended membrane; no true tail; wings short. The length of the grebe is generally between twenty-one and twenty-two inches, and from the carnal ionit. one and twenty-two inches, and from the carpal joint to the end of the longest feathers is eight inches.—
Ref. Yarrell's History of British Birds. (See also DABCHICE.)

GREEK ARCHITECTURE.-The early architecture of GREEK ARCHITECTURE.—The early architecture of Greece is exemplified in the massive remains of walls at Mycenæ, Argos, and others of the old Grecian cities, which are composed of huge, irregular, underessed blocks of stone roughly piled together. (See Cyclopean Architecture.) It is utterly devoid of CYCLOPEAN ARCHITECTURE.) It is utterly devoid of ornament, but in one or two instances examples remain of attempts to adorn the stones forming the piers and listed of a gateway with rude representations of animals, as in the principal entrance to the Acropolis of Mycene mentioned above. Grecian architecture, properly so called, was the production of a far later age, and may be traced to that of Egypt-and Western Acropolishing as it does the strength and additional actions. age, and may be traced to that of Egypt-and Western Asia, combining, as it does, the strength and solidity of the former with the more elegant features and decorative principles of the latter. The Doric, the first of the three Greek orders, assimilates more closely to the architecture of Egypt than either of the others, in its substantial and massive proportions: it is simple in character, but always conveys to the mind of the spectator a striking impression of its dignity and beauty. The Ionic order, and its ornamentation, is derived from the architecture of Western Asia, and is characterized by a greater degree of lightness in its proportions than the Doric order possesses, and the introduction of decorations in minor details. The Corinthian, the last, and by far the most elegant of the Greek orders, surpasses the Doric and Ionic orders in freek orders, surpasses the Doric and Ionic orders in its elaborate adornment and symmetry of proportion; but, even in this, a similarity to the architecture of Egypt can be traced in the bell-shaped capitals of its columns and the clusters of leaves that curl outwards from its surface. But, although each order exhibits a decided step in advance of that which precedes it, as far as elegance and ornament are concerned, the three orders were uniformly characterized by beauty and harmony of proportion; and it may be said that the buildings of ancient Greece, especially the temples, were superior to those of any climate and any age as regards simplicity of form, the purposes for which they were intended, and the habits and requirements of the people for whose use they were erected. The chief characteristics and the scale of proportions preserved in the three Grecian orders, will be found elsewhere (see Aconfricture); and the principal parts that compose what is termed an order in classic architecture have been treated under their respective headfar as elegance and ornament are concerned, the three

## Greek Architecture

ings (see Abchiteave, Babe, Capital, Column, Connice, Emtablature, Fairea), but it may be desirable to state here the particular features and marks by which each order may be readily distinguished, and to point out some recent discoveries that have been made with regard to the method adopted by have been made with regard to the method adopted by the Greeks to give the appearance of perfect beauty to their works, and to avoid anything that might offend the eye of any of this highly civilized and educated people. It should also be stated, that each order con-sists of two distinct parts,—the column and the gntab-lature,—which are again subdivided, the former into the base, shaft, and capital; and the latter into the architrave, frieze, and cornice; and that it is architrave, frieze, and cornice; and that it is by certain differences in these divisions and subdivisions that the orders themselves are distinguished. The Dorio order may be readily discerned by having no base to the column, the lower end of the shaft resting base to the column, the lower end of the shate resting immediately on the pavement; the shaft itself is also adorned with broad shallow flutings separated by a sharp ridge, the capital being composed of a broad echinus moulding surmounted by an abacus, while the frieze is adorned at intervals with projecting pieces called triglyphs, which are about half the width of the lower diameter of the column, having the appearance of being accounted to the column. of being separated into three equal parts by two verti-cal grooves cut deeply into the material of which it is formed, the horizontal section of which is in the shape of the letter V, the outer edges of the piece being chamfered off at the same angle. This order was in some instances richly adorned with sculpture in low relief along the frieze, and in high relief on the metopes or spaces between the triglyphs, the tympanum of the pediment rising in an obtuse angle above the entablature being also filled with sculpture in high relief, and frequently with perfect statues. The Ionic and Corin-thian capitals are to be distinguished from each other, the former by its volutes, and the latter by its exquisitely carved foliage and its height, which is considerably greater than that of the capitals of the Doric and Ionic orders. There is little perceptible difference in the shafts of the columns of the Ionic and Corinthian orders, or in their entablatures. The temples of the Greeks were generally placed on a level platform, consisting of three steps rising one above another, and of greater or less depth in proportion to the height and diameter of the columns that were placed upon them. These steps were too deep to afford the means of access to the temple, and it is supposed that intermediate steps were placed at intervals along the larger ones, to allow the worshippers to pass easily from one to another, and thus to gain the level of the portice. The Greek windows and doorways, like those of the Egyptians, were narrower at the top than at the bottom, the sides inclining inwards. They were generally surrounded by a moulding, which was broken at the top of the window by a right angle, and turned outwards on either side, for a short space, and turned outwards on ether side, for a snort space, in a horizontal direction, before resuming its perpendicular course, so that an architerave or lintel was formed above the window of the same width as the sill below. The doorway was always in the centre of the pro-naos, or portice of the temple, and was carried up to a considerable height for the purpose of admitting light into the interior. The arch is never employed in Grecian architecture, which is chiefly characterized by the use of the beam supported on columns, by which an appearance of great strength and solidity is obtained. It is also marked by its strict adherence to outlines formed by horizontal lines, and lines that are vertical, or nearly so, being frequently slightly inclined inwards. It is a known principle in perspective, that straight lines proceeding to a great distance in the same direction present a slightly curved appearance to the eye of an observer. To correct this appearance, the Greek architects carefully constructed their vertical and horizontal lines in the form of a very slight and scarcely perceptible ourve, giving their columns an entasis, as it is termed, or a slight outward swelling near the middle; which principle of construction was effected by means of certain fixed rules. The columns also, instead of being vertical, had a slight inclination invarials and their reasonable and the platforms or in a horizontal direction, before resuming its perpenserved in the three Grecian orders, will be found else-laso, instead of being vertical, had a slight inclination where (see Archifecture); and the principal parts which the temples stood, were constructed with a very tecture have been treated under their respective head-slight rise in the centre. Mr. Pennethorne discovered

the existence of these curves in 1837, and the truth of his statements well subsequently corroborated by Mr. Penrose, who examined many of the ruined temples of Greece, and made careful measurements of their proportions, which led to a discovery of the principles on which they were constructed. Of the three orders of Grecian architecture, the Parthenon at Athens, and the Temple of Minerva at Ægina, may be cited as the best examples of the Doric order; the Erechtheum and Pandrosium at Athens, of the Ionic order; and the choragic Monument of Lysicrates, in the same city, as the most beautiful, and almost the only oxisting pure Greek specimen of the Corinthian order. Examples of the Doric and Ionic orders, or rather adaptations of them, are common enough in the metropolis and its vicinity, the Grand Terminus of the London and North-western Railway, in Euston Square, being a specimen of the first, and the portices of the British Museum and the General Post-office, St. Martin's le Grand, and St. Pancras's Church, being examples of the second. There are but imperfect data for determining the style of architecture adopted among the Greeks for dwellings of a private character—Ref. English Cylopadia, Arts and Sciences; Fergusson's Handbook of Architecture; Penrose's

of the British Museum and the General Post-office, St. Martin's le Grand, and St. Pancras's Church, being examples of the second. There are but imperfect data for determining the style of architecture adopted among the Greeks for dwellings of a private character.—Ref. English Cylopadia, Arts and Sciences; Fergusson's Handbook of Architecture; Penrose's Finiciples of Athenian Architecture.

GREEK, or EASTERN CHURCH, originated in the disensions that took place between the patriarchs of Constantinople and the popes of Rome. In consequence of the political position of the city as the seat of the imperial government, the church of Constantinople sought to render itself independent of the see of Rome. Disputes on various points of doctrina occurred from time to time between the two churches, curred from time to time between the two churches, curred from time to time between the two courcies, but the great breach did not take place till 802, under the patriarch Photius. He reproached the Western church with having introduced various innovations; as the celibacy of the priests, the introduction of images into churches, and the double procession of the Holy Ghost, with the addition of "filioque" (and from the Son) to the Nicene Creed. On the fall of Photius, Son) to the Nicene Creed. On the fall of Photius, however, the breach was in a manner healed, though very imperfectly, and in the 11th century dissensions broke out afresh. The final separation took place in 1054, when Leo IX. excommunicated the patriarch Michael Cerularius, who had inveighed against the corruptious of the clergy, and attacked the errors of the Western church. Several attempts were made on either side to effect a reconciliation, but in vain. The popes were anxious to effect a union in order to extend their dominions; and the emperors of Constantinople, when pressed by the Turks, attempted to obtain the assistance of the West by a promised restoration of the Eastern church to that of Rome. At a later period attempts were made by mised restoration of the Eastern church to that of Rome. At a later period attempts were made by some of the Protestant churches to come to an amicable arrangement with the Eastern church, but with like unsatisfactory results. The Greek church denies the authority of the pope, and maintains that the Church of Rome is not the only true Catholic church. It acknowledges no vicar of Christ upon earth like the pope; disclaims infallibility, works of supercrogation, and indulgences. It rejects purgatory, but admits of prayers for the dead; and forbids all kinds of carved jurgers. but cermits paintings, and pays a kind of images, but permits paintings, and pays a kind of secondary homage to the Virgin and saints. It denies auricular confession to be a divine command, but practises confession attended with absolution, and sometimes penance. It admits the seven sacraments, but baptism is performed by immersion of the body three baptism is performed by immersion of the body three times in water; and the communion of both kinds is practised with leavened bread, and the wine is mixed with water. The anointing of the body with the chrism is allowed to all sick persons as a means of restoring them to health, and purifying them from their sins. The secular clergy are permitted to marry but once, and only a virgin, and laymen are allowed to marry only three times. Like the Roman Catholic church, it accepts tradition as well as the Bible, but differs from it, as well as from all Protestant churches, in maintaining that the Holy Ghost proceeds only from the Father, and not also from the Son. The ritual of the Grock church consists almost entirely in outward ceremonies, preaching or religious instruction being rarely

strictly observed than those of the Roman Catholics. The clergy are divided into two classes,—the higher and the lower; the former comprising patrigods, metropolitans, archbishops, and bishops, all of whom are chosen from among the monks, and must live in cellibacy; the latter the monks, or black clergy (from their dress), and the secular, or white clergy. The lower escular clergy are the archpriests, priests, deacons, hypodeacons, and lectors. The monks, as well as the nuns, who are less numerous, generally follow the rule of St. Basil, with the exception of those of Mounts Sinai and Lebanon, who follow the rule of St. Anthony. One of the most celebrated convents is that of Mount Athos. The total number of persons belonging to the Greek faith is estimated at about 66,000,000; of whom about 49,000,000 are in Russia, 12,000,000 in Turkey, 3,500,000 in Austria, 800,000 in Greece, 180,000 in the Ionian islands, 125,000 in Montenegro, and about 3,000 in Prussia. As regards its government, the Greek church is made up of ten independent groups, numbering in all 279 bishoppies. 1. The Church of Constantinople, governed by a patriarch, having under him 136 bishops; 2. the Church of Alexandria, under the patriarch of Alexandria, who resides at Cairo, and has five bishops; 3. the Church of Antioch, with its patriarch and 14 bishops; 4. the Church of Jerusalem, with its patriarch and 14 bishops; 5. the Russian Church, with 60 bishops, governed by a synod; 6. the Church of the island of Cyprus, with four bishops; 7. the Austrian Greek Church, with 11 bishops; 8. the Church of the island of Cyprus, with four bishops; 9. that of Montenegro, with one bishop; and 10. the Hellenic Church in Greece, with 24 archbishops and bishops. Besides these ten divisions of the Greek church, which recognize each other as orthodox, there are a number of sects, particularly in Russia, which fully acknowledge the doctrinal basic of the Greek church, but for various reasons keep aloof from it. The Greek church predominates in all Russia, Europe strictly observed than those of the Roman Catholics The clergy are divided into two classes,—the higher and reasons keep aloof from it. The Greek church pre-dominates in all Russia, European Turkey, Greece, the lonian islands, and Montenegro. In Turkey, the the lonian islands, and Montenegro. In Turkey, the patriarch of Constantinople has not only spiritual, but also a kind of temporal jurisdiction, as he is regarded by the Turkish law as the head of the Greek Christians. who have to pay him a yearly tribute. The Russian Greek church asserted its independence on the fall of Greek church asserted its independence on the fall of Constantinople? in the middle of the 15th century, when a patriarchate was established at Moscow. The natriarchate was abolished by Peter the Great, who organized a supreme court for the regulation of spiritual matters, to six at the new capital of St. Petersburg. Since that time the Church of Russia has been virtually contained that the Care The Visited Great Church since that time the Church of Russia has been virtually controlled by the Car. The United Greek Church is a section of this body, which, by the continued efforts of the Roman church, were induced to acknowledge the supremacy of the pope, while they, on the other hand, were permitted to abide by all the peculiar usages of the Greek church which did not effect furthermental destricts. peculiar usages of the Greek church which did not affect fundamental doctrines;—as the use of the Greek language in divine servise, the reception of the Lord's supper in both kinds, &c. &c. In Russia, almost all the members of the United Greek church were induced, under the reigns of Catharine II. and Nicholas, to dissolve their connection with the Church of Rome; and active their connection with the Church of Rome; and at present this section of them is most numerous in Austria. For an account of the festivals, ceremonies, liturgies, &c. of the Greek church, see the Rev, John Mason Neale's History of the Eastern Church.
GREEK FIRE. (See FIRE, GREEK.)
GREEK MUSIC.—Until quite a recent period it was believed that the art of music had attained to a high

suricular confession at the dead with absolution, and some times penance. It admits the seven sacraments, but baptism is performed by immersion of the body three times in water; and the communion of both kinds is practised with leavened bread, and the wine is mixed with water. The anointing of the body with the chrism is allowed to all sick persons as a means of restoring them to health, and purifying them from their sins. The seculer clergy are permitted to marry but once, and only a virgin; and laymen are allowed to marry only three times. Like the Roman Catholic church, it accepts tradition as well as the Bible, but differs from it, as well as from all Protestant churches, in maintaining that the Holy Ghost proceeds only from the Father, and not also from the Son. The ritual of the Grock church consists almost entirely in outward cere in maintaining that the Holy Ghost proceeds only from the Father, and not also from the Son. The ritual of the Grock church consists almost entirely in outward cere of the differs from the son are the long of the best of the arts and sciences." All that are known to be in existence of the old Greek music are a few hymns and an ode by Pindar. Even these fragments are held to be spurious by some archaeologists.

#### Greek Language and Literature

GREEK LANGUAGE AND INTERATURE.—The earliest inhabitants of Greece were the Pelasgi, who, according to Herodotus, spoke a barbarous or foreign tongue. They were allied to the Iraman tribes of the north of India; consequently, that element in the Greek lan-India; consequently, that element in the Greek language which exhibits an affinity for the Sanscrit, is the Pelasgic; and hence the strong resemblance in words and inflections, which is found to exist between the two languages. The Hellenes, or Greeks proper, subsequently migrated into the country, and the language of the aboriginal inhabitants came to be looked upon as barbarous. The Hellenes were an Ionian race, and their language is said to have had an affinity to the Persian. It is but right to state, however, that this account of the origin of the Greek language is not universally received, for the subject is so involved in doubt, that no certainty can be arrived at regarding it. The Greek is a branch of the so-called Indo-Germanic, The Greek is a branch of the so-cashed indo-Germanic, or Aryan family of languages. It consists of three principal dialects,—the Æolic, Doric, and Ionic; to which at a later period was added the mixed Atticulated; and besides these there were several minor dialects. The Doric was a rough, hard, broad dialect, with long a predominant over all the other vowels. It was spoken originally in the mountains of Thessaly, whence it travelled southward, and became the lan-guage of the greater part of the Peloponnesus. It was purest in Messenia, and softest in Syracuse and Agrigentum. Its centre was Sparta. It is found in the gentum. Its centre was Sparta. It is found in the writings of Pindar, Theocritas, Bion, and Moschus. The Æolic was a more ancient dialect than the preoeding, but was refined at an earlier period, and was less harsh than the Doric, although also broad and open. It was spoken north of the Isthmus of Corinth (with the exception of Megaris, Attica, and Doris), in the Æolic colonies of Asia Minor, and on some islands of the Ægean sea. It contains some of the Pelasgic forms, and is to be found in the fragments of Sappho, Myrtis, and Alexes. The Ionic is the softest and most musical of all the dialects. It abounds in vowels and diphthongs, and is partial to labials and linguals. It was the earliest cultivated of the dialects, and is that of Homer, and other of the early authors, as Hesiod, Herodotus, &c. It was spoken principally by the people of Attica and the Ionian colonies of Asia Minor. The Attic sprang from the Ionic, from which at first it differed but little. It was developed principally after the Persian wars, and was brought to perfection by the poets, philosophers, and historians of Greece, who flourished after that time. It held a middle place between the hardness of the Adolic and Doric and softness of the Ionic. It was harmonious and powerful in its expressions, concise and regular in its syntax.

Rachelus. Sophocles, Euripides, Thucydides, Aristo-Richylus, Sophoeles, Euripides, Thucydides, Aristo-phanes, Plato, Demostheues, and Isocrates, rendered it immortal. Grammarians afterwards distinguished between the genuine Attic, as it exists in these masters, and the Attic of common life, calling the latter the common Greek, or Hellenic dialect; and even the later common Greek, or Hellenic dialect; and even the later attic writers, posterior to the golden age of the literature, were called Hellenes, or common Greeks. In this latter class are Aristotle, Theophrastus, Apollodorus, Polybius, Plutarch, and others, many of whom, however, wrote genuine Attic.—At what time this language first began to be expressed in writing is a question of much uncertainty. According to tradition, Cadmus the Phænician introduced the alphabet Cadmus the Phonician introduced the alphabet into Greece about 1500 years B.O. To him, sixteen of the letters of the present alphabet are attributed; four, according to Pliny, were introduced by Palamedes at the time of the Trojan war, and four by Simonides of Ceos during the Persian war. The ancient letters were all uncial, or what we call capital; the present cursive or round letters occur first in inscriptions of the age of Augustus, and recombined. inscriptions of the age of Augustus, and resemble the Coptic forms. The Greeks wrote originally from right to left; afterwards alternately, the one line from right to left, and the next from left to right (called boustrophedon, as being the mode in which oxen ploughed in a field); and finally from left to right, as we do now. The Greek language is a branch of the great Indo-Germanic family of tougues. It is rich in roots, flexible in the formation of words, picturesque

# Greek Language and Literature

Anacreon, majestic in Æschylus and Pindar, noble in Sophocles, pathetic in Euripides elegant in Xenophon, subtle in the Sophists, distinct in the Stoies, clear in Aristotle, and fluent in the orators. Its syntax is free, full of inversions, subtle and perfect, yet without obscurity. Its antiquity, its intrinsic excellence, its literature, and its influence on the progress of the fairest portion of mankind, challenge our deepest admiration. "In order," says Mure, "to the attainment of the highest excellence, it is essential, first, that a language should be the original invention of the people who speak it; secondly, that this people should be gifted not only with a fine sense of emphony, but with variety and extent of intellectual powers. These lence, its literature, and its influence on the progress favourable circumstances were combined in the case of the Greek in a greater degree than in that of any other known language. While it is in all essential respects a radically original tongue, its mechanism, both in sound and structure, reflects all the harmony, versatility, and precision, which mark the genius of the race by whom it is spoken."—(Language and Literature of Ancient Greece.) The language of modern Greece is what is termed Romaic, or Neo-Hellenic. It differs from the ancient Greek chieffy in the formation of the the Greek in a greater degree than in that of any other from the ancient Greek chiefly in the fermation of the tenses, and in the termination of the nouns; but the difference between the two is not greater than between the Doric and the Attic dialects of ancient Greece. The tendency of late years has been to assimilate it more and more to the ancient tongue; and a good ancient Greek scholar will have little difficulty in ancient Greek scholar will have little difficulty in making out a Greek newspaper of the present day, The origin of Greek literature is lost in the darkness of antiquity. The earliest existing monuments of it carry us back to nearly 1000 years D.o., and even then we find the art of poetical composition existing then we find the art of poetical composition existing in the highest perfection. The admirable structure and the wonderful language of the Homeric poems imply a long period of antecedent culture. Although both the Iliad and Odyssey display traces of the infancy of the nation, and manifest a spirit of simplicity peculiar to the childhood of the human race, "yet the class of poetry under which they fall appears in them at its full maturity; all the laws which reflection and experience can suggest for the epic form are observed with the most refined taste; all the means are em-ployed by which the general effect can be heightened; nowhere does the poetry bear the character of a first essay or an unsuccessful attempt at some higher poetical flight; indeed, as no subsequent poem, either of ancient or modern times, has so completely caught of ancient or modern times, has so completely enigne the genuine cpic tone, there seems good reason to doubt whether any future poet will again be able to strike the same chord."—(Miller.) Of the poets prenames of many of them, as Olen, Linus, Orpheus, Museus, and many others, are preserved to us; but their works are all lost. The poems which have come down to us under their names are manifest forgeries. The Iliad is founded on the legends of the war of Troy; The Hiad is founded on the legends of the war of Troy; the Odyssey, on the return of Odysseus (Ulysses), Various other poems, as the "Batrachomyomachia," or Battle of the Frogs and Mice, are attributed to Homer; but they evidently belong to a later period. The Homeric poems were made use of as models, and as a basis with which to connect their works, by a series of later poets, who are commonly known as the "cyclic," but of whose works only the titles, brief abstracts, and fragments, have been preserved. Heaiod, the next great epic poet after Homer, was a Boxotian, and is believed to have flourished about the middle of the 9th century before Christ. His principal poems are the "Works and Christ. His principal poems are the "Works and Days," the leading subject of which is the various occupations and duties of life in its several relations; and the "Theogonia," containing a history of the loccupations and duties of life in its several relations; and the "Theogonia," containing a history of the origin of the world and the genealogies of the gods. Lyric poetry arose on the decline of the epic, and was much cultivated from about B.O. 776 to the commencement of the Persian wars. The spirit of the times and the various contests in which the different states were engaged, greatly favoured this kind of poetry. Next to the gods, who were celebrated at their festivals with lyrms, their country, with in its modes of expressing thought, highly plastic and its heroes, was the leading subject of their song; and suphonious; simple and sublime in Homer, playful in in everything there was a more powerful impulse to-

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#### Greek Language and Literature

wards meditation, investigation, and labour, for the attainment of a desired end than before. Among those who were distinguished in the field of lyric poetry, or in the improvement of music, history furnishes us with the names of Archilochus of Paros, inventor of the iambus; Tyrtsous of Miletus, author of war songs; Callimachus of Ephesus, inventor of the elegisc me sure; Aleman the Lydian; Arion of Methymna, who sure; Aleman the Lydian; Arion of Methymna, who perfected the dithyrambus; Terpander of Antissa, investor of the burbitos (a kind of lyre); the tender Sappho of Mitylene; her countryman Aleœus; Eriuna, the contemporary of both; Minnermus of Colopbon, the flute-player; Stesichones of Himera; Ibyeus of Rhegium; Anacreon and Simonides of Coos; Hipponax of Ephesus; Timocreon of Rhodes; Lasus of Hermione; Corinna of Tanagra, the friend and instructress of Pindar. As gnomic writers, Theognis, Phocylides, and Pythagoras, deserve to be named; and as a fabulist, Æsop. In the order of time, several of these belong to a later period, but they are troperly placed here, on account an the erder of time, several of these belong to a later period, but they are properly placed here, on account of the connection. The greatest of all the masters of lyric sung, however, was Pindar, born at Cynosec-phalte, in Bootia, in Euc. 522. Of his numerous com-positions, we have only the four series of Epimeian odes, i. e., odes written in commemoration of victories gained at the four national festivals,—the Olympic, Pythian, Nemean, and Isthmian. The earliest writers Pythian, Nemean, and Isthmian. The earliest writers of prose were those who first engaged in philosophical speculations. Of their writings, however, only a few fragments have been preserved. Thales was the founder of the Ionic philosophy, to which belonged Pherecydes, Anaximmeder, Anaximenes, Anaxagoras, &c. Pythagoras established the Italian school, and was followed by Alomeon, Timans, Epicharmus, Theages, Archytas, and others. In history the Ionians took the lead. Cadmus of Melitus, about 540 B.O., is the earliest; Acesilaus of Argos soon followed; then Pherecydes of Leros, Charon of Lampsacus, Hellamicus of Mitylene, Dionysius of Melitus, all of whom proceded Herodotus, but are rather chroniclers than historians, in the strict but are rather chroniclers than historians, in the strice but are rather chroniclers than historians, in the strict sense of the term. The first great historian was Hero-dotus of Halicarnasaus (18½ n.c.), whose delightful work is still preserved, and well entitles him to the name of the "Father of History." The drama took its rise from the festivities with which the country people solemnized the gathering in of the vintage, and which were accompanied with songs and dances. By degrees, variety and some measure of art were given to these proceedings. The first direct step to the introduction of the drama was made by Thesnis, who added action of the drams was made by Thespis, who added action to the chorus (B.C. 536), and who exhibited on movable stages, at the cross-ways or in the villages. He was followed by Phrynichus, who flourished B.C. 511, and who was the first to bring female characters upon the who was the first to bring female characters upon the stage. Æschylus, the great perfecter of the tragic art, was born at Eleusis 525 B.C. He first substituted actors who repeated their parts by rote, in place of an intermediate speaker, who related his story extemporaneously. Sophocles and Enripides, the other great masters of Greek tragedy, flourished soon after Æschylus. Comedy was first brought into regular form by Epicharmus, who lived about 500 B.C. Cratinus, Crates, Phrynichus, and Emplis, are well-known names in this Phrynichus, and Eupolis, are well-known names in this field: but the greatest is Aristophanes, who flourished nea; out the greatest is Aristophanes, who flourished in the early part of the 5th century B.C., and of whose comedies eleven have come down to us, though he is said to have written fifty-four. In what is termed the "old comedy," public and private characters were introduced by name; but subsequently it was forbidden by law to introduce any living paragraphs. by law to introduce any living person by name, and what is known as the "middle comedy" arose in consequence. The "new comedy" was a still farther modification, which comedy first assumed in the age of Alexander. Of the middle comedy period, only a few fragments of committee here became any committee of committee here. sequence. The "new comedy" was a still farther modification, which comedy first assumed in the age of Alexander. Of the middle comedy period, only a few fragments of comedies have been preserved. The carliest writer of new comedy was Philippides, who flourished 323 n.c.; and the two most celebrated of his successors were Philemon and Menauder. The fertility and excellence of the Greek dramatic literature were most remarkable. The prose compositions that belong to this age were equally distinguished by their duels to this age were equally distinguished by their duels to most remarkable. The prose compositions that belong to this age were equally distinguished by their duels (nor 471 n.c.), whose work on the Pelcoponnesian war is not only the first specimen of what has been called philosophical history but remains unsurpassed

## Greek Language and Literature

down to the present time. The historical works of Xenophon (born 447 n.C.), though not equal to that of Thuoydides in vigour of colouring and depth of reflection, are yet adorned with every grace of narrative and description. His other works are valuable for the light they throw on the spirit of Greek institutions and the peculiarities of Greek life. Of the works of Otesias, Philistus, Theopompus, and Ephorus, which belong to a period somewhat earlier, none have come down to us entire. In philosophy, to which the toachings of Socrates (born 448 B.C.) gave a great impulse, we have the writings of Plato (born 428 B.C.), and his pupil Aristotle (born 384 B.C.). Plato was endowed with a brilliant imagination, and loved to sear into the highest regions of imagination, and loved to soar into the highest regions of speculation; while Aristotle was a student and observer, practical results being the objects of his investigations. Plato's sense of the beautiful was exquisite, and his style was at once idiomatic and lofty; while in passages it moved in a rich and stately music which all ages have admired. Aristotle's style, on the other hand, was terse, logical, close, seldom adorned with poetical embellishments, and never with rheterical exaggerations. He never entered the world of ideas with Plato, but everything he wrote embedded the results of careful and extensive observations, or comparison of observations. His works embrace the subjects of observations. His works embrace the suppers or logic, rhetoric, physics, metaphysics, natural history, and politics. Plato founded the Academic school, whose point of reunion was the Academy on the Cephissus, north of Athens. Aristotle established the Peripatetic school in the Lyceum, near the Hissus, on the carrest raid of the sity. In the same period Peripatetic school in the Lyceum, near the lissus, on the opposite side of the city. In the same period, political eloquence, always a characteristic form of Greek eloquence, reached its highest perfection. Public discussion was the general rule in the Greek republics. In Athens, especially, it was indispensably necessary for the statesman who wished to acquire any influence to be an eloquent public speaker. Solon, Pisistratus, Miltiades, Aristides, Themistocies, and Pericles were orators as well as legislators, counsellors, and generals. Pericles was the first to cultivate the art, and to adorn his mind with the teachings of philosophy and general literary culture. The first rhetorical school at Athens was opened by Georgias of Leontini. school at Athens was opened by feorgas of Leontin.
Other sophists and teachers of rhotoric were Protagoras, Prodicus, Hippias, &c. Among the Athenian
orators whose works are extant, in whole or in part,
By Antiphon, Andocides, Lysias, Isocrates, Lyourgus,
Hyperides, Eschines, Demades, Demosthenes, and
Dinarchus. Mathematics was now cultivated, and geography served to illustrate history. Astronomy is indebted to the Ionic school, arithmetic to the Italian, indebted to the Ionic school, arithmetic to the Italian, and geometry to the Academic school, for many discoveries. As mathematicians, Theodorus of Cyrene, Meton, Euctemon, Archytas of Tarentum, and Eudozus of Cnidus, were celebrated. Geography was particularly enriched by voyages of discovery, which were occasioned by commerce; Hanno's voyage to the western coast of Africa, the Periplus of Scylax, a description of the coasts of the Mediterranean, and the discoveries of Pythias of Massilia in the north-west of Europe, deserve mention. The study of nature was GISCOVERIES OF TABLESS OF DIABESTIAN IN THE MOTAL-WEST OF Europe, deserve mention. The study of nature was likewise pursued by the obliosophers; and the healing art, hitherto practised by the Asclepiades in the temples, was raised to a distinct science by Hippo-crates. The expeditions and schievements of Alexancrates. The expectations and active tense to instant der furnished abundant materials for history and study; but, on the whole, the gain was rather in extent than in value. After the death of Alexander, although literature still continued to be cultivated in Greece, yet, till the Roman conquest, the principal seat of letters and science was Alexandria; and this

the west, are two parallel series of writers,—the Pagan, and the Jewish and Christian. Of the former, the most important are Babrius, Strabo, Epicetus, Plutarch, Dion Chrysostomus, Arrian, Pausanias, Marcus Antopinus, Aristides, Lucian, Diogenes Laërius, Achilles Tatius, Dion Cassius, Atheneus Herodianus, Philostratus, Plotinus, Longinus, Iamblichus; of the latter, Josephus Philo, the suthors of the books of the New Testament, Clement of Rome, Justinus, Polycarp, Irensus, Clemens of Alexandria, and Origen. During the long period which elapsed between the establishment of the seat of government at Constantinople, A.D. 330, and the capture of that city by the Turks, A.D. 1433, the names in Greek literature are comparatively few. They comprise the series of outhors known as the Byzantine historians; the ecclesiastical and other writers, as Eusebius, Athanasius, Gregory Nazianzen, Epiphanius, Synesius, Socrates, Basilius, Georgius Pisides, Malales, Georgius Syncellus, Nicephorus, Photius, Constantine Porphyrogenitus, Leo (Philosophus) Theodosius; the rhetoricians and grammarians; a few poets, as Moschus, Quintus of Smyrna, Coluthna, Agathas; and in the 12th century, Ptochoprodromus; the romance writers Longus Kenophou of Ephesus, Heliodorus; the historians, as Zosimus, Procopius, Anna Comnena, and her husband Bryennius, Chalcocondylas, &c. After the capture of Constantinople, intellectual pursuits languished under the tyranny of the Turk. Since the establishment of the Greek kingdom, literature has made great progress in Greece. In the department of education, the publications have been innumerable. In history, works of distinguished morit have appeared, as the history of Fyernhebes, whose works are quoted with approbation by Niebuhr; the series of histories by Professor Paparrhegopoulos, distinguished by the eloquence of their style and the animation of their narrative; and the "History of the Greek Revolution," in four volumes, by Triccupos. In cultivated poetry, we may mention the works of Rizos, of Alexander an the west, are two parallel series of writers,—the Pagan, and the Jewish and Christian. Of the former, the "History of Greek Literature" by Asopios, will sustain a fair comparison with similar works in other European countries; while the lectures and occasional discourses of the professors in the university, among whom we may mention Asopios, Pericles Argyropoulos, Philippos, and Kontogones, have great merit in point of style and learning. Many newspapers and other periodicals are now published at Athens and other veel to be making rapid advances. Much that augurs well of their future success may be gathered from their conduct during and since their recent revolution (1862)—Ref. Browne's History of the Literature of Ancient Greece, continued by J. W. Donaldson (3 vols. Svo. London, 1853; Critical History of the Language and Literature of Ancient Greece, by William Mure (5 vols. London, 1855, 57,—not completed).

General Periodophy.—The philosophy of ancient Greece is important, as being the great source of all subsequent speculation. Down to a recent period, the works of the two great masters, Plato and Aristotle, were universally received and followed. Having given special articles on these two systems (see Aristotes Largery Periodophy Periodophy and Pe sustain a fair comparison with similar works in other

origin of nature and the original matter of the world. The earliest of the schools was the Ionian, beginning with Thales, who held that water was the original ele ment whence all things proceeded. Among his folment whence all things proceeded. Among his tollowers were Auaximander and Anaximenes, the latter of whom regarded air as the primary element of all things. The Italian, or mathematical school, was founded by Pythagoras, who was distinguished by his knowledge of the mathematical sciences, and defined numbers to be the principles of all things. The Eleatic school, so called from Eles, in Italy, from finding creation incomprehensible, pronounced experience a mere appearance, and endeavoured to determine the nature of things merely from notions of the understanding. Xenophanes, Parmenides, Molissus, and Zeno belonged to this school. Opposed to the Eleatic was the Atomic school, at the head of which were Leucippus and Democritus. They asserted the external world to be real, and all things to be made up of minute atoms, invariable, indivisible, and imperceptible, owing to their extreme tenuity. From these contending schools arose the class of the Sophists, who, being skilled in the arts of dislectics and rhetoric, distinguished themselves as disputants, and, pretending to universal knowledge, they entirely undermined all lowers were Auszimander and Anaximenes, the latter of guished themselves as disputants, and, pretending to universal knowledge, they entirely undermined all earnest striving after truth, and destroyed the difference between truth and error. The chief of the sophists were Gorgias, Protagoras, Prodicus, Hippiss of Elis, Polus, Thrasymachus, and Callicles. The sophists compelled their antagonists to seek for some solid foundation on which philosophy might take its stand, and introduced the second period of its history, which begins with Socrates. The earnestness and they output here of Socrates convend itself to the shallowtory, which here is with Socrates, The earnestness and thoroughness of Socrates opposed tiself to the shallowness and dippancy of the sophists. From looking merely at external nature, he taught man to look inwards upon himself. His system was more practical than speculative, regarding the great object of philosophy to be the attainment of correct ideas respecting man's moral and religious obligations, and the perfection of his nature as a rational being. Among the followers of Socrates, who especially devoted themselves to the pursuits of philosophy, were Antisthenes the Athenian, founder of the Cyrine school; Aristippus, chief of the Cyrenaic, and Pyrrho, gave their attention exclusively to questions of morals, and their practical application; while Euclid of Megara, Phædo of Elis, Menedemus of Trebria, were occupied with theoretical or metaphysical inquiries. The more comprehensive genius of Plato inquiries. The more comprehensive genius of Plato embraced at once both these topics, and attempted to combraced at once both these topics, and attempted to build up a complete and connected system of philosophy. (See Platonic Philosophy.) His scholar Aristotle, characterized by a great knowledge of nature, as well as by great logical and reflective powers, became the founder of the Peripatetic school. (See ARISTOTELIAN PHILOSOPHY.) The Cynical school finally merged in that of the Stoics, and the Cyrenaic in that of Epicurus. From this time (about n.c. 300) dates the commencement of the third period of the history of Greek philosophy.—that of its decline. The contests between the different schools led to a spirit of doubt being introduced into philosophy. The contests between the different schools led to a spirit of doubt being introduced into philosophical speculation, scepticism began to prevail, and attempts were made to unite the different contending parties in a system of celecticism.—Ref. Lewes's and Tennemann's Histories of Philosophy.

eclecticism.—Ref. Lewes's and Tennemann's Histories of Philosophy.

GREEN HELLEBORE, green (Sax. grene, green; Lat. helleborus, hellebore). (See Verateur.)

GREENBACKS, the familiar name by which American notes are known. The manufacture of a paper for these notes, combining the qualities of wear, and being splitless and unphotographic, was a much-desired desideratum. Accordingly it was resolved to make some experiments, which were intrusted to Doctor Grayno, who, produced a paper as firm as parchment. were nuiversally received and followed. Having given special articles on these two systems (see ARISTOTRIJAN particles and the see notes, combining the qualities of wear, and being aplifiess and unphotographic, was a much-desired desideratum. Accordingly it was resolved to make the summary of the see notes, combining the qualities of wear, and being aplifiess and unphotographic, was a much-desired desideratum. Accordingly it was resolved to make Gwynn, who produced a paper as firm as parchment, there periods,—its youth, its maturity, and its decline. The first period extends from the time of Thales to that of Socrates (600 to 400 n.c.), and is characterized by a striving after a knowledge of the ultimate causes of nature and liberty, in which reflection was not yet systematized nor separated from poetry. The Greek mind elevated itself through poetry to philosophy. The sheegonies, cosmoding it is more and increased the second of the second o

#### (3reenbacks

Greenfinch

printing these notes is made in mills, six in number, for making as many different colours. Each one is called a 4-horse-power mill, though the whole six are driven at the same time by an engine which one could pick up with one hand. It not only turns these mills, but at the same time runs three Hoe-cylinder presses. but at the same time runs three Hoe-oylinder presses. In the engraving-room science and art are both displayed to perfection. There is, perhaps, no engraving so fine, and requiring so much time to execute, as that on the plate now being prepared for national note-printing: one the size of a bill, on which the workman has been employed almost a year, is a copy of one of the paintings in the rotunds of the Capitol. The figures are of exquisite proportions and the water. figures are of exquisite proportions, and the water-lines, though plain, extremely delicate in their tracery, lines, though plain, extremely delicate in their tracery. With the single plate, as it comes from the hande of the engraver, it would be impossible to do the printing required, and as it is equally impossible to have a number of plates engraved, it becomes necessary to repeat them in another way. This is done in the following manner:—The engraving is made on a plate of soft steel just the size of the bill or bond, and the cuttings are indentations. When flushed, the plate is hardened and taken to a "transfer-press," where a roller of soft steel, of just the circumference to take in the size of the plate, is rolled over it under heavy pressure, leaving the impression on the roller in a raised form. This roller is in turn hardened, and then any number of flat plates similar to the original then any number of flat plates similar to the original are prepared, and receive in like manner the impression from this roller, and become fac-similes of the plate engraved, and we have produced in a few minutes what it has taken months with chisel and eyeglass to make. The printing is now done on the old-fashioned make. The printing is now done on the old-lasshored engraver's press, being nothing more than a simple iron roller covered with cloth and paper, to press the printing-paper into the indentures, placed in a strong frame, and turned back and forth by hand by spokes placed in the end of the roller. Two persons work at placed in the end of the roller. Two persons work at each press—a man and a woman, the former attending the plate, the latter the paper. The plate is kept warm while working by a gas heater. The sheets when printed are each laid between other sheets of thin brown paper, to keep them from blurring, and sent in hundreds to the drying-room. The first process of bond-printing is numbering the coupons and the denomination with a yellow mordant, and as they fly from the press, they are bronzed, as they appear when issued. Yellow is used because it cannot be photographed without showing too plainly to be mistaken, as was remarked about the fibre in the paper. This discovery was made in the following manner:—When Mr. Clark was at the head of the Bureau of Construction, he had a map made for military pur-Construction, he had a map made for military purposes, which it was necessary to repeat. It was photographed, and an obscure road marked with a faint yellow line was discovered to be black in the copies. yellow line was discovered to be link: in the copies. He then photographed a specimen-sheet of inks or paints, and of all the colours except black, yellow was the only one which might not have been altered with ease by a touch of the brush. It was black as the black ink itself. Hence any attempt to photograph this colour will only lead to the discovery; and as it black ink itself. Hence any attempt to photograph this colour will only lead to the discovery; and as it is the groundwork of bonds and other securities, and covered by the printing, it seems another security against fraud. The series-numbering is the last process before trimming. The work is done by women, the machines being worked by a treadle. The figures are placed in the edges of six discs, placed side by side, and fastened to an arm worked by the treadle something after the style of a Wheeler & Wilson sewing-machine. The discs are turned by a ratchet, and will number from 1 to 990,990. For consecutive numbering a little hook is attached to the ratchet, and the machine shifts itself. Otherwise the discs are turned by the number. The trimming and cutting were formerly done by hand, and, of course, very imperfectly and laboriously. There were two things to be overcome in cutting by machinery,—the inequality of the registry and the shrinkage. It was desirable that the edges should be trimmed so that they would wear well. If cut with a straight knife, they would be beveiled one way. As they are now cut, with circular the shrinkage and the ways. The and will number from 1 to 999,990. For consecutive numbering a little hook is attached to the ratchet, and the machine shifts itself. Otherwise the discs are turned by the number. The trimming and cutting were formerly done by hand, and, of course, very imperfectly and laboriously. There were two things to be overcome in cutting by machinery,—the inequality of the registry and the shrinkage. It was desirably that the edges should be trimmed so that they would wear well. If cut with a straight knife, they would be bevelled one way. As they are now cut, with circular bevelled one way. As they are now cut, with circular large of the place, and two hundred yards beyond thagstes. Generally, and two hundred yards beyond thagstes, of the place, and two hundred yards beyond the place, and two hundred yards beyond the place, and two hundred yards beyond the place, and two hund

trims the margins, and another separates them: this latter is an ingenious contrivance. It slits them very fast, and lays them regulary in, a box, each series of numbers separately. The notes are lettered A. B. C. fast, and lays them regulary in a box, each series of numbers separately. The notes are lettered A, B, C, and D, and the numbers on each are the same; therefore it is essential they should be kept carefully apart. Each of the boxes that receives them has a movable bottom. When the cutting for the day first commences this bottom is near the top of the box; but as the cutting progresses, and the number of the bills increases, a ratchet lets the bottom drop the thickness of a bill, so the box is kept just so full at the time to make the bills slide in without doubling. It is intended that the cutting should be a criterion by which to judge of the genuineness of the bills, for every one must be the same width and length. If the end of a must be the same width and length. If the end of a bill be placed on the centre of another, there will be must be the same width and length. If the end or a bill be placed on the centre of another, there will be found no difference in the width,—an exactness which cannot be given by the hand. The currency cuttingmachine is more complicated, as it cuts both ways and files them in bundles of five dollars each, and we are not sure but it binds and seals them. Wet printing is the process now used in this establishment. The wetting is done by cloths, instead of by dipping or sprinkling as in newspaper printing. A room is prepared especially for this, with iron weights for pressing. Each man has his particular place assigned him, and all work in harmony, and with precision and celerity. Ordinary bills are wet and dried three times during the printing. To do this some eighty heavy hydraulic printing-presses are being set up, when what is called dry-printing, or printing on dry paper, will for the first time be successfully performed. There is a very perceptible difference between the present way and the one to be substituted. Specimen sheets show a clearer impression and a remarkable distinctness. a clearer impression and a remarkable distinctness, with which the faintest water-line is made to stand boldly out. This process, which is entirely new, has only been introduced after the most vehement and virulent opposition. The first tests were made with hand-pumps; machine-pumps are now being rigged, and the whole will soon be in motion. There has been added to the measure of the pumps a regulator in the shape of a weight, which is intended to take up their lost power as their force is exhausted; take up their lost power as their force is exhausted; thus keeping up nearly the same pressure all the time. The clacks and safeguards upon every one employed in the department, from the claif down to the lowest labourer, operate at every turn. Not even a clauk sheet, much less a printed paper, is passed from one hand to another without being counted and receipted for; and unless there is collusion from one to another through every process under which the receipted for; and unless there is collusion from one to another through every process under which the paper has to pass before it is money,—through the entire range, there cannot be an over-issue. The paper is issued from one room, and is re-issued from that room sixteen or eighteen times before it is put into circulation; being counted, charged, and re-receipted for each time, and re-counted, re-charged, and receipted for through each process that it passes after leaving this room. Five hundred persons are employed in note, bond, and currency making. By the present process of printing, each pressman takes above five hundred impressions per day. By the introduction of hydraulic presses the rate of production of these elaborately-prepared notes may be estimated at from three to five hundred impressions per hour.

CHERN CLOTH, BOARD OF, is a court of justice connected with the royal household, sitting under the lord high steward, and attended by various officers of the household. It has the charge and supervision of the royal household in all matters of justice and

#### Greenhouse

colour. The greenfinch is very common in England, and it is easily tamed. It imitates the songs of other birds, but is not much prized as a native songster. (See GROSBBEK.)



GREENPINCE.

GREENHOUSE, green'-house, in Gardening, a house with a roof and sides of glass, which is used for the cultivation and forcing (see FORCING) of plants which are too tender to endure the open air all the year, or which have been imported from foreign countries. The first of these stagectures appears to have been erected in the 17th century, acording to Loudon, who states that the earliest was planned and carried out by one Soloman de Caus, of Heidelberg, about the year 1619; in order to shelter some orange-trees which had been transported to the gardens trees which had been transported to the gardens of trees which had been transported to the gardens of the town. It is stated in Brande's Dictionary that the greenhouse, "being a structure of luxury, ought to be situated close to the house to which it belongs; and that its length and breadth may vary at pleasure, but that its height should never be less than that of the loftiest apartments from which it opens." The best aspect for greenhouses is the south or south-east, as in those facing the north or east delicate plants will not thrive so well in winter. In most of these buildings the plants and shrubs are placed in pots or boxes, which are placed on different stages or forms, so that the heat may be regulated to suit their different requirements. Sir Joseph Parton, the architect of the Great Exhibition of 1851, has plauned and erected some of the best examples of greenhouses and similar structures. (See also separate articles on Conservatory, Hothouse, and Orangery.)

GREENLAND WHALE. (See WHALE.)
GREEN-ROOM is the name given to the actors' retiring-room in a theatre, and was originally conferred probably on account of its being painted or otherwise ornamented with green.

ornamented with green.

GREEN-SAND, in Geol., the term applied to the lower portion of the cretaceous system (which see) as developed in the south of England, from the greenish colour of some of the beds of sand.

GREEN SCHERLES B.—An arsenite of copper.

GREENSTONN, in Geol., a general name for the hard granular-crystalline varieties of trap (which sec), consisting mainly of felspar and hornblende, felspar and augite, or felspar and hypersthene. The term has reference to the greenish or blackish-green colours which these igneous rocks commonly though not invawhich these igneous rocks commonly, though not invariably, exhibit.

GREEN VITRIOL. (See IRON, SULPHATE OF.)
GREEN ULTRAMARINE. (See ULTRAMARINE.)
GREGARIOUS ANIMALS, gre-gai-re-us (Lat. gregarius,
from grez, a hord), is a term applied, in Nat. Hist., to
those saifhals which have the habit of assembling or living in flocks or herds.

GREGORIAN CALENDAR. (See CALENDAR.)

GREADER, gre-naid (Sp. granado), a missile invented and brought into use about 1694, consisting of a small shell about two or three inches in diameter, charged with powder, and fired by a fuse, or by percussion-caps placed on nipples paojecting from the surface. It is thrown by the hand from the parapet of a fortrees, among soldiers advancing to the assault along the

#### Greyhound

covered way and across the ditch. Grenades are also thrown into the trenches when the approaches are driven close to the main works.

driven close to the main works.

GERNADIER, gren-id-deer', the name formerly given
to any soldier belonging to the infantry or cavalry who
carried granades. Granadiers were introduced into
the French service in 1667, and into the English service by Charles II., about 1634. They were armed with
muskets, swords, pouches containing granades, and
hatchets, and took the lead in the assault of a fortress. At first only two men were selected and trained as grenadiers from each company of the two English regiments of foot-guards that were then in the service; but shortly after there were two companies of grenadiers to each of these regiments, while horse grenadiers were attached to the regiments of life-guards and horse granad. diers were attached to the regiments of life-guards and horse-guards. Until a few years ago, a grandier company, consisting of the tallest men in the battalion, formed a part of every regiment of infantry, which took the right when the regiment was in line, and marched first when in column. They were distinguished by wearing bear-skin caps, and shells with fire issuing from them on the collar of the tunic; but they were armed with a rifle and bayonst, like the rest of the regiment; and although they retained the name, they did not perform the duties that were originally assigned to green diers.

to grenadiers.

GERTNA GEEEN MARRIAGES, gret'-na, is the name given GRETA GREEN MARHIAGES, gret'-m, is the name given to a class of irregular marriages which were formerly very common, and took their name from the village of Gretna Green, on the borders of Scotland. They originated in the greater laxity admitted by the law of Scotland than by that of England, on the subject of marriage. In Scotland, a marriage may be contracted by a mutual declaration to that effect by the two parties in the presence of witnesses, a mode which is much more simple and expeditious than that of England; and hence it was largely taken advantage of by runaway couples from England; the rule being, that a marriago is valid in England if contracted according to the law of the place in which it was solemnized. Cretna Green of the place in which it was solemnized. Gretna Green of the place in which it was solemnized. Greens Green being the most convenient place on Scotol ground for parties from England, the marriages usually took place there; but they were also celebrated at Spring-field, Annan, Coldstream, and other places along the border. At Greens Green and the other places there were usually one or more persons who took upon themselves the attitude of the prices to add in the content. were usually one or more persons who took upon themselves the duties of the priest, and in whose presence the declaration was made. The marriage service of the Church of England was sometimes read, in order to please the parties. The practice is said to have been begun at Greens Green rather more than a century ago, by a person named Paisley, a tobacconist. Afterwards it was carried on by various individuals, each inn, in fact, having its rival priest, besides various others, who carried on the business on their own account. Latterly, the best-known of these worthies was a blacksmith, though he is said to have had a formidable rival in a person who was employed in breakwas a blacksmith, though he is said to have had a for-midable rival in a person who was employed in break-ing stones on the roadside, and who in this way had the advantage of getting the first word of the parties in passing. Though sometimes large sums were received, the effect of competition had been to reduce the fee, in some cases, as low as half a crown. The marriages effected in this way were at one time esti-mated as high as 500 a year. The practice, however, has virtually been put a stop to by 19 & 20 Vict. c. 96, which declares that no valid marriage can be conwhich declares that no valid marriage can be con-tracted in Scotland, unless one of the parties had, at the date thereof, his or her usual place of residence there, or had lived in Scotland for twenty-one days next preceding such marriage

GREY FRIARS. (See FRANCISCANS.)

GREYHOUND, gray'-hownd (Ang.-Sax.), (Canis grains), a species of dog used for the chase, which appears to have been known even in the most remote ages of anhave been known even in the most remote ages of antiquity, as it is represented on some of the oldest of Egyptian monuments. Its first portraiture that can be relied on is in a painting on one of the tombs of the fourth dynasty of Egypt, which must be upwards of 4,000 years old. The cultivated English greyhound, according to Blaine's "Encyclopedia of Rural Sports," exhibits a model of elegance, and a combination of symmetrical proportions probably unrivalled by any other animal but the race-horse; and the perfection

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#### Griss

of the mechanism for speedy progression is apparent throughout its structure. As the greyhound hunts by sight rather time by smell, its eyes are placed more conspicuously forward than in other dogs. The head is beautifully shaped, and slender in proportion; its muzzle is long and pointed; the ears droop at the points; the back is broad and muscular; the hold being lank and very much contracted in its body being lank, and very much contracted in its lower parts. The legs are long and muscular, while the thest is capacious and deep, with the tail slender and



GREYHOUND.

curved upwards at the end. The Irish greyhound, or wolf-dog, is a variety of this animal: it is stronger and larger, but it is not so fit for hunting purposes, as it lacks the speed and keen eyesight of the true greyhound. The Italian greyhound is a much smaller variety than the English, and is a very delicate animal. From its diminutive form and tender constitution, it is more fit for the duties of a lapdog than for those of the chase.—Ref. Blaine's Encyclopædia of Rurul

Sports.

GMAS, gri'-as, a gen. of plants belonging to the nat. ord. Myrtacea, natives of Jamaica. The tube of the calyx adheres to the ovarium; the limb is small, 4-cleft, and obtuse; four petals, coriaceous; numerons stamens, inserted in a square diac; the filaments joined at the base into a series of five, the minor ones being very short; the anthers small and kidney-shaped; the style wanting; the stigma cruciate and hidden in the curved stamens; the fruit ovate, 8-furrowed, and crowned by the culyx. There is only one species, the G. cauliflora, or anchovy pear. In appearance it is a tall tree, with small branches, very long oblong leaves, and large white flowers, placed on long oblong leaves, and large white flowers, placed on short many-flowered peduncles. It generally grows in boggy places, and its fruit is an ovate, being as in boggy places, and its fruit is an ovate, being as large as an alligator's egg, and of a brownish usset colour. This fruit is pickled, and eaten in the same way as a mango. The anchory pear is easily propagated by seed, and the young plants must be kept in a moist heat. It may also be propagated by large cuttings placed under glass in heat; and a loamy soil is last suited to its course.

cuttings placed under glass in heat; and a loamy son is lest suited to its growth.

GRIFFIN, griffin, or GRYPHON (Fr. griffon, Lat. gryphus), in ancient Myth., a fabulous animal, supposed to be generated between a lion and an eagle. It is represented with four legs, wings, and a beak; the upper part resembling an eagle, and the lower having the characteristics of a lion. This imaginary animal was supposed to watch over gold-mines and all hidden treasures, and was consecrated to the sun, where having some of the ancient vainters represent whose chariot some of the ancient painters represent whose charlot some of the ancient painters represent as drawn by griffins. Spanheim states that both the chariots of Nemesis and Jupiter were likewise provided with similar steeds. The griffin is found on many old medals, and it seems to have been a principal ornament. On the provided with a specific seems of the principal ornament of the principal ornament. nectus, and a seems to have over a principal ornament of Grecian architecture. In heraldry, the griffin is the symbol of strength, swiffness, courage, and vigilance, and it thus finds a place on many escutcheons: it is usually biazoned rampant, although occasionally segret-

#### Grinding-Mill

ant is thought to be its proper position. The griffin, mentioned cometimes in Scripture, was a species of

mentioned cometimes in Soripture, was a species of eagle, called by the Latins ossifruga, or osprey.

GRINDING-MACRINE.—A finely-executed piece of machinery, by Messrs. Nasmyth, Gasked, & Co., has been invented to grind up the faces of the different parts of machinery when a large surface is required to be made perfectly smooth. At figs. 1, 2, and 3 are shown severally a side elevation, an end elevation, and a plan of a double-face grinding-machine, the one side being a repetition of the other. To the wo exterious frames, a pare holded two large plummer. two cast-iron frames a,a are bolted two large plummer-blocks for carrying the main shaft, having at each extremity the circular frames divided into twelve comextremity the circular frames divided into twelve compartments, in which are placed the grinding-stones f, each being adjustable by the small set acrews m round its circumference. On the top of the cross-frames a are placed two longitudinal frames (b, b), made also of cast iron, for supporting the long bed-frames c, c, c and also the self-acting apparatus farnished to this machine. Two motions, the one at right angles to the other, are given by the slides d, working along the beds c, and also the face-plates e for carrying the work, by which it is brought into contact with the grinding-stones. Pits are made to allow the wheels for carrying the stones to work in. The self-acting motion given to the work being faced, by means of which it slides along the bed c, while the grinding-stones are revolving in their ares, is obtained in this manner: on the main shaft next to the driving-riggers, or pulleys g, is a worm (f), which, as it revolves, works a worm-wheel, represented by the dotted lines in fig. 2, thus communicating the motion to the upright spindle; from this it is carried by the to the upright spindle; from this it is carried by the bevel-wheels to the spindle running horizontally the whole length of the machine, having at each extremity three small bevel-wheels. The action of this apparatus is thus:—Supposing the slide to be travelling in the direction towards the small bevel-wheels, two of the direction towards the small bevel-wheels, two of which are required for the purpose, while the third, or outer one, runs freely on the spindle without producing any effect, the small clutch being disengaged from it; on the travelling slide d is fixed a stud or pin (h'); a long rod (k), of the same length as the bed c, is movable in two stud-bearings fixed to it. As the slide d travels, the pin h' comes in contact with a second stud, or pin, adjusted to any position on the rod h, according to the length of the motion required, which must naturally press it forward, and thereby which must naturally press to that, and the blow out the clutch on the end of the spindle, which, being shifted from one bevel-wheel to the other, disengages that which had been at work before, while it engages the outer one, that had been running loosely on the spindle: by this curious contrivance the screw for working the slide revolves in a contrary direction, and instead of drawing the slide d towards it, sends it and instead of drawing the side a towards it, sends to back. A counterbalance weight (n) is connected to the extremity of the rod h, whereby the work is advanced to the face of the grinding-stone; it is on the upper part of the slide ethat the work is fixed. A substantial foundation, consisting of stonework, is prepared for receiving the two frames a, a, and to which they are firmly bolted down by strong holding-bolts. Another mode of performing this same operation might be adopted by fastening a whole grindstone into the chucks, and passing a bolt through two surface-plates of two feet diameter each, one on the middle plates of two feet diameter each, one on the middle part of each face of the grindstone, he which means they would be more effectually secured in their places. We annex a complete list of the references to the figures. a, cross-frames, or standards; b, longitudinal frames; c, bed-plates; d, cross-sides; s, slides, or face-plates, for carrying work; f, grindstones; g, driving-riggers; h, rods for reversing motion by means of tappet h' and clutches i, s, clutches; j, bevel-wheels it, worm on main shaft for working bevelgeer j; m, screws for setting stones; n, counter-balance weights. balance weights.

GRINDING-MILL.—A valuable invention, by Mr. Bogardus, of New York, is shown in the annexed engraving. The advantages of this eccentric grinding-mill are:—1. The peculiar motion of the plates will of itself discharge ground substances, so that many substances can be ground thereby which would altogether

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## Grinding-Mill

## Grinding-Mill

choke other mills. 2. In other mills a given point in one of the plates continually describes the same circle on the other; but in this mill it traverses on the other plate, at an infinite variety of angles, every point within two concentric circles apart from each other,

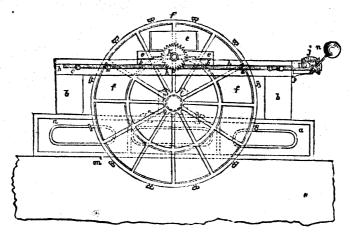


Fig. 1.-SIDE ELEVATION.

twice the distance of the centres of the plates, thereby rendering the wear-and -tear of the plates uniform, and preserving the grinding action of every point. 3. tum, India-rubber, flax-seed, oil-cake, &c. Of the luckers with its distance from the centre; but in this by other mills; in short the eccentric mills are more

by other mills; in short the eccentric mills are more economical in the power required to drive them, and mill, every point from the centre to the circumference economical in the power required to drive them, and has the same grinding power. A considerably smaller in the labour of tending them; they are less costly for mill will, therefore, effect a given purpose, and the the work they do, and more portable; they are capa-

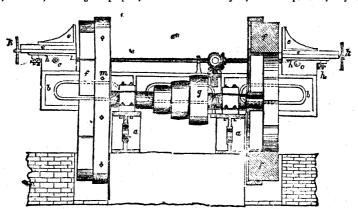


Fig. 2 .- END ELEVATION.

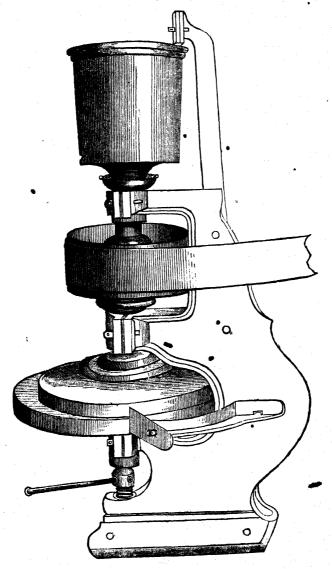
eccentric mill is therefore more portable than other mills. A. The ever-changing action of the mill, and the quick discharge of the substance ground, prevent it from becoming heated, so that the eccentric mill may be profitably employed in grinding substances, which, in other mills, would be either spoiled or deteriorated in quality, or, by their melting, be impossible to be ground. If other mills were driven with that speed which can be safely applied to the eccentric mill, they would be made red-hot in a few minutes. These mills have been successfully introduced for the follow-

ble of being applied to purposes for which other mills are useless; and the wear-and-tear is trifling. The mill should run to the right, and make not less than three hundred revolutions per minute. Nearly any quantity can be ground by increasing the speed. The mill is regulated to grind fine and coarse by the underscrew on which the end of the shaft revolves: turning the screw to the left will bring the plates together and cause the mill to grind finer. The regulating screw is held firmly in any position by a small screw placed against its side. There are three reservoirs, which

# Grinding-Mill

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should be well supplied with oil. The first is on the top of the upper plate two or three tablespoonfuls of oil should be poured into this reservoir through a small hole made in the top of the mill for that purpose. The second reservoir is the box through which the main



THE BOGARDUS GRINDING-MILL.

shaft passes: this is just under the spout of the mill.

This reservoir is filled with tallow, so that it may supply itself. The third reservoir is the step in which the ply itself. The third reservoir is the step in which the main shaft revolves: that may be filled with oil. The main shaft revolves: that may be filled with oil. The feeding is regulated by a shoe acting against the tabe of the upper plate, which causes the shoe to vibrate:

#### Grindstone

the lower separate revolving plate at a distance from it, to suit the nature of the material to be ground. The centre of motion of the latter plate is placed about an unce out of the centre of the upper one; it is driven merely by friction generated by the abrasion of the abrasion of the substances in process of grinding between the plates. An adjusting screw, F, is placed beneath the lower plate, for the purpose of setting the latter at the transport of the stone of t

#### Griseldia

im size according to the purpose for which they are intended. In grinding to a smooth surface large away, axes, scythes, swords, and all heavy cutlery, heavy stones are used, weighing sometimes from two to three tons; these are secured on wrought-iron shafts, and the workman applies his weight to the article on the stone. Grindstones, or grit-stones, are almost entirely composed of sandstone, and are obtained from the sandstones and willstone arise of the scel-

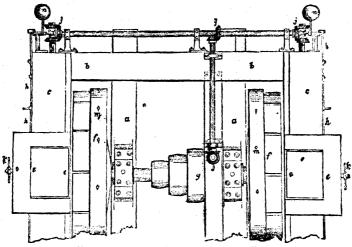


Fig. 3. DOUBLE-FACE GRINDING-MACRINE-PLAN.

form of grinding-mill is that used in Mexico, called Arrastre, or Tahona. It is extensively employed in the mining districts of Mexico for grinding silver ores the mining districts of Mexico for grinding silver ores previous to their amalgamation. It consists of a strong wooden axle, moving on a spindle in a beam above it, and resting on an iron pivot beneath, turning in an iron bearing, which is inserted into a post wood, which rises about a foot above the ground, in the centre of the arrastre. The shaft is croxed at right angles by two strong spars, which form four arms, each about five feet long one excented which is 9 feet angree by two strong spars, which form four arms, each about five feet long, one accepted, which is 9 feet long, to admit of two mules being attached to it: by this arm the machine is worked. The grinding is performed by four large porphyritio or basaltic stones. These are loosely attached by thongs of leather or and larged work for the four arms and arms. small-sized rope to the four arms, and are dragged round over the ore, which is put in with water until its ground to a very fine slifte, or mud, called the lama. One of these machines, when in good working condition, will grind from 600 to 800 lb. of ore in twenty-four hours. In Guanaxnato, where the best and finest grinding is obtained in the arrastres, the lining and foundation, and the grinding-stones, are, of course, grained porphyry, and form a rough surface. The cost of this apparatus in Mexico, including the paving of the bottom and the four metuniles, or stones, is on an average 27. The original small-sized rope to the four arms, and are dragged ciuding the paving of the bottom and the four meta-piles, or stones, is on an average £7. The original weight of a metapile is about 700 lb.; its dimen-sions are 2 feet 8 inches long, 18 inches broad, and 18 inches deep. Notwithstanding the hardness of the stones employed, they are so worn as to become un-serviceable in the course of ten or twelve weeks; the bottsex, however, is only replaced once in twelve serviceable in the course of ten or twelve weeks; the botters, however, is only replaced once in twelve months. A drawing of this curious machine is given in Ure's Dictionary of Arts, Manufactures, and Mines, vol. ii. p. 536. From the same authority we have borrowed the above description.

GRENDSTONE, grind'stone, a well-known tool used in aimest every branch of the mechanical arts for grinding to an edge, piont, or face, the various tools and in manufacturing; and also in various manufactures for reducing metallic surfaces, such as the main of steel implements, &c, Grindstones vary

measures. They are split out of the quarry by wedges, and dressed on the sides by chisel and ham mer. A square hole, in proportion to the weight, is cut in the centre; the face is then chipped down, as nearly as possible to its intended circumference, and sent to market. After mounting and wedging the stone upon its arle, it is chipped off at the prominent points and then turned. The heavy stones, in particular, require great care in the hanging and trimming, that they may run smoothly. The best-known varieties of grindstone are, according to Mr. Knight, the following:—the Newcastle grindstones, which abound in the coal districts of Northumberland, Durham, Yorkshire, and Derbyshire. They are selected of different degrees of density or coarseness, according to the work they are intended to perform. A similar de-scription of stone is that called the Bilston grindstone, which is a stone of great excellence, light in colour, and of a fine, sharp texture, without being too hard. It is only to be obtained from a very limited area in or near Bilaton, in Staffordshire, where it overlies the The Wickersley grindstones are obtained from a village about nine miles east of Sheffield. These stones are much used for the finer kinds of edge tools. tones are much used for the informatics of edge tools. The Sheffield grindstone is a hard, coarse grit-stone, which is obtained from Hudsley, about fourteen miles north of Sheffield; it is used for grinding large files and similar tools. The Devonshire batts come from near Columpton. Yorkshire and Congleton grit are other binds of grindstone. The Devonters are contacted from the state of the other kinds of grindstone. The Burr stones are well known, and bear a high character; they come from known, and hear a high character; they come from La Ferte-sous-Jouarre, in the department of the Seine-et-Marne, France. For grist-mills they have been pronounced as of unequalled value. The com-bined roughness and hardness of this tertiary quartz endow it with immense advantages. The stones formed of this rock are in general pieced, which

renders them very expensive.

GRIERLDIS, gris-el'-dis, is the name of the heroine of a popular tale of the middle ages, originally apparently Italian, but which was subsequently adopted by various other nations. She was originally a poor charcoal-burner, whom the Marquis Walter of Saluzzo took to

#### Grist-Mill

wife, and then put her humility and obedience to the hardest tests; but having victoriously withstood them all, a reconciliation took place. As a tale, said to have an historical foundation, we first meet with it in Boc-caccio's Decameron (z. 10). It was translated into Latin by Petrarch in 1373, and in the 15th century it

Latin by Petrarch in 1373, and in the 15th century it was well known in Germany. It was dramatized in Paris in 1398, in England 1599, and in Germany, by Huns Sachs, in 1546.—Ref. Conversations Lexikons. GRHEL-MILL.—A most ingenious form of machine for trinding grist has been invented in the United States by Mr. Ass Barber. It is capable of grinding corn in the ear, and can also grind all other kinds of capin and although the protest critical states. orn in the ear, and can also grind all other kinds of grain; and, although it has metal grinders, never requiring to be sharpened. It is so constructed, and the cooling surfaces so arranged, that the grain is not heated. By a 2-horse power it is capable of grinding from eight to ten bushels per hour. The accompanying figures show all the details of this very useful machine:

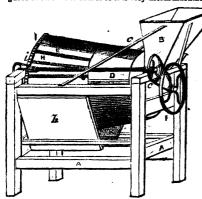
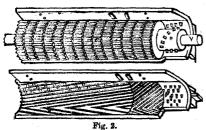


Fig. 1.

—A A is the frame; B is the hopper; C are stays connected with the longitudinal beam of the frame supporting the hopper; B is a large revolving cylinder; covered with a wire cloth for botting; F is a fly-wheel; G is a band-wheel, or pulley, driven by a band from the main driver, to propel the shaft H, which has a small pinion on it meshing into cogs, or a large cogrim (1) of the large cylinder E; J is a small pulley on H, which drives by a band the shaft (not seen) of an interior scraper; K K are two angular boards to



guide the ground meal into the granary. This is a sectional view, and does not show all the interior, but merely the grinding surfaces. B is a revolving iron grooved collar made of a series of cast grooved rings, secured to the shaft. This shaft is made to sit and reculve in O, a concave iron grooved bed, which is a stationary; D is a shoulder, with teeth to grind the cob as it leaves the hopper, before being submitted to the operation of the revolving roller B. Suppose these two sections to be placed in the inside of E, with B revolving above and in the concave bed O; now the grain enters in the hopper, and the revolving is a ground-rent payable out of the ground before the 978

#### Ground Annual

roller being set in motion, it will easily be perceived that the grain will be carried into and between the roller and the bed, and discharged through the channels or grooves on C. Still the meal thus ground has to be bolted. This is done in the most simple manner: to be bolted. This is done in the most simple manner: as E is revolving, the fine meal falls through the belting-cloth at the bottom, and the coarse is carried round, and falls down into the mill, to be ground over again. By this way of grinding, the revolving grinder and the bed need not be in such close contact as other grinding, mills must be; and the huge revolving surface of E keeps perfectly cool, and allows the arterior of the mill, to be quite over in the attention of the mill, to be quite over in the attention. revolving surface of E keeps perfectly cool, and allows the exterior of the mill to be quite open to the atmosphere. There is a scraper, which is revolved by the band-frame I, at the right of fig. 2, which keeps the grooves of the roller or bed from getting clogged.

GROAT, grawt (Du. groot), a silver coin once current in England, equal in value to four-ence of our present money. It was introduced by Edward III., about 1351, and has been revived in our modern four-enny views (1835). though the name is not

fourpenny piece (1835), though the name is not

fourpenny piece (1835), though the name is not retained.
GROATS (Ger. grutse), oats divested of the integriments or hulls. They are used for making grael: when crushed, they constitute the Embden and prepared groats of the shops. (See Avena.)
(Seo Avena.)
(Seo Avena.)
(Hood, groom (from Flem. groom), the name of a servant in some inferior place, generally applied to servants in stables; but it has a special signification as applied to the groom of the chamber, groom of the stole, &c. The groom of the chamber, groom of the stole is a great officer of the royal household, who has control over all the duties pertaining to the bedchamber (the only portion of the royal chambers wherein the lord chamberlain has no authority). He does not take any fixed turn of duty, but attends only on state occasions. Slole signifies a robe of honour.
GROSBBAK, grose-beek (Coccobraustes), a bird

state occasions. Stole signifies a robe of honour.

GROSBRAK, gross-beck (Coccothraustes), a bird which comes under the general hest of Fringillida, in the sections of Insessores, Conirostres. The characteristics of the class are given under Fringillida, to which the reader is referred. There are several varieties; as the hawfinch grosbeak (Coccothraustes vulgarie), the pine grosbeak (Lowis enucleator), and the green grosbeak, which is treated under the head of Chernymone (which see). The hawthorn grosbeak, or hawfinch, however, will suffice to describe the appearance of the bird, as between it and the others there is little difference. The hawthorn grosbeak, or common grosbeak, inhabits England, France, some parts of Italy, Germany, Sweden, and even the south of Russia. The varieties in the colour of this bird are white, yellowish-grey, and grey; the wings and tails are

of Russis. The varieties in the control of this had white, yellowish-grey, and grey; the wings and tails are often white, and the plumage generally partakes of that colour. The grosbeak inhabits the woods in summer, and in the winter generally makes its appearance in towns and villages. The nest, which the female builds, is towns and villages. The nest, which the female builds, is one of the prettiest kind, being coloured and decorated with all kinds of brillantly-tinted mosses, and lined inside with down and feathers. The eggs are of a bluishgreen colour, with brown spots. The bird is generally about seven inches long; it has no song worthy of notice, and is not a common bird with us, although it is to be met with in England. (See FRIN VILLIDE.)

Gross, gross (from Fr. gros), in Com., b, which certain things are reckoned, is twelve dozen.

GROSSULARIAGEE., gros'-st-lit-re-ord feet. (Lat. grossula, a gooseberry), in Bot, the Gooseberry or Current fam., a nat. ord. of Diccipledones, sub-class Calgojfora, consisting of shrubs, natives of the temperate regions of Europe, Asia, and North America. Some of the species have spines or prickles. The leaves are alternate, lobed, and radiate-veined. The flowers are arilary, racemose, perfect, or rarely unisexual; with superior

lobed, and radiate-veined. The flowers are axillary, racemose, perfect, or rarely unisexual; with superior calyx 4—5 lobed; five minute petals inserted the calyx; five stamens alternate with the petals, and inserted in the same manner; and an inferior 1-celled overy, with two parietal placentss. The fruit is pulpy, with numerous seeds. There are but two genera and 95 species. Some are showy garden plants; but they are mostly remarkable for their agreeable acid fruits, known as gooseberries, and red, white, and black currants. (See Ribbs.)

Ground Annual. oround (Anc. Sax.). in Socta Law

#### Ground Liverwort

tenement in a burgh is built. It is used in contradistinction to feu apppala

GROUND LINERWORT. (See PRITIGERA.)

GROUND NUT. (See ABACHIS.)
GROUND-RENT, in Law, is a periodical payment for the privilege of building on another's land.

the privilege of building on another's land.

GROUNDELL. (See BENECLO)

GROUND, growse (Ang.-Sax.), a species of game bird which belongs to the family of the Tetraonida. The bill is rather short, broad at the base, compressed and arched, with the tip obtuse, the nostrils being placed at the base of the bill, and proteoted with feathers, or a hard scally substance; the legs are stout, with the tarei naked and scutellate, but sometimes covered with feathers to the toes; the hind toe, which is rarely wanting, is rather small and elevated, the wings abort and rounded, and the tail also rounded at the extremity. These birds live chiefly on the ground, on which they can run with great swiftness, and they feed principally on vegetable substances, such as berries, seeds, and the buds of trees and shrubs. They vary greatly in size, some being nearly as large as a turkey, while others scarcely exceed a pigeon in size. There are several varieties of the grouse. The most important bird of this class is called the capercalizie, or wood grouse. (See Capencaltzie). To speak correctly, however, the black-cock (Tetrao tetrix) is one of the largest species of grouse which can be termed truly British, as it is found both in England, Scotland, and Ireland. The form of the tail is one of the most peculiar features in this bird, as the four outer feathers are considerably elongated and curred outwardly at the tip, so that the tail has the appearance of a double hook. In its habits and other characteristics, the black-cock strongly resembles the caper-calizie. The common grouse, or ptarmigan (Lagopus) GROUNDSEL. (See SENECIO.) ties, the black-cock strongly resembles the caper-cailzie. The common grouse, or ptarmigan (Lagopus vulgaris), is another variety of this species, and the feathers of this bird extend to the very extremity of the toe. Like the preceding classes, it feeds on ber-ries and the small shoots of plants; and, unlike them, it is not polygamous, the males and females pairing regularly in the breeding season. The red grouse (Lagopus scoticus) is peculiar to these islands, and inhabits all heathy districts, whether lowland or mountainous; whilst the ptarmigan (Lagons vulgaris) only inhabits very hilly countries, as the northern parts of Europe and the mountainous regions of Spain and The red grouse is the same colour in plumage Italy. The red grouse is the same colour in pummar all the year round, whilst the ptarmigan acquires a white habit in the winter months. The grd grouse is a most prolific bird, and it is wonderful how it can be a most prolific bird, and it is considered to the wonderful how it can be a most prolific bird, and it is considered to the wonderful how it is considered. a most profine bird, and it is wonderful how it can exist in such large numbers, when it is considered what quantities are shot every season to supply the London market between the months of August and

GRUB, grub (Ang.-Sax.), a small worm: it is a name however, more properly applied to the hexapod worms produced from the eggs of beetles, &c., which are eventually transformed into winged insects. (For fur-

ther information, see Pupl.)
Grus, grus (Lat. grus, a crane), the name of one of Bayer's constellations in the southern hemisphere, between Eridanus and Sagittarius. It has no stars of the first or second magnitude.

GRYPHOSIS, gri-fo'-sis (Gr., from grupoein, to incurvate), in Suze, is a disease of the nails, which turn inwards, and invitate the soft parts below.

nuwards, and nutrate the soft parts below.

Gualacum, gwai'-yā-kum (fr. guayac, its native name),
a gen. of the nat. ord. Zygophyllaceae. The species
G. officinale is a fine evergreen tree from 40 to 60 feet
in height, and of a dark, gloomy aspect. It is a native
of the West-India islands, particularly Cuba, St.
Domingo, and the south side of Jamaica. The wood
is remarkable for its hardness toucheast and is remarkable for its hardness, toughness, and dura-bility, qualities which render it particularly valuable for many purposes. It is known in commerce as lig-num vites. This wood, and a resin obtained from it, for many purposes. At is known in commerce as any num vite. This wood, and a reein obtained from it, are officinal in our pharmacopecias, and are commonly known in the shops respectively as guaiacum-wood and guaiacum-resin. The latter is generally procured by heating the wood, either by boiling chips in salt water, or more commonly by burning kollow billets, and hing the resin as it flows out from thom. It also

#### Guano

the wood and resin are used as stimulants, disphoretics, and alteratives, chiefly in gout and Theumatism, and also in syphilitic and various cutaneous affections. G. sanctum, a native of Porto Rico, and G. arboreum, the guayacan of Cumana and Carthagena, are said to

gusyacan of Cumana and Carthagena, are said to yield some of the lignum vite of commerce.

GUALTHERIA, gwill-the're-id, in Bot., a gen. of the nat. ord. Ericara. (The species G. procumbens is a native of North America, and is commonly known as the partridge-berry. Its leaves possess aromatic, astringent, and attimulant properties, which they owe to the presence of a volatile oil and tannin. The oil is known in commerce under the names of oil of partridge-berry and oil of winter-green. An infusion of the leaves is employed in certain parts of North America as a substitute for China tes, and is called Mountain or

Salvador tea.

Substitute for Chma tes, and is called Mountain or Guano, gu-àn'-o (from the Peruvian word kuano, dung), the excrement of sea-fowls, found principally in large quantities upon some parts of the coasts of Peru, Bolivis, and Africa. Although of comparatively recent use in this country, guano has been employed as manure by the inhabitants of Peru from the most remote periods. By its means they have been able to reuder fertile the otherwise unproductive sandy soils along the coast. While the Incas governed the country, the birds were protected from violence by very severe laws. Any one landing on the guano-bearing islands during the period when the birds were breeding, was put to death; and a similar sentence was decreed against those who killed any of the birds at any time. Baron Humboldt first brought specimens of guano to Europe in 1804, and sent them, for examination, to Fourcroy, Vauquelin, and Klaproth,—the best analytical chemists of the day. He thus described it:—"The guano is deposited in layers of 50 or 60 feet thick, upon the granito of many of the South-Sea islands off the coast of Peru. During 200 years the coast birds have deposited guano only a 300 years the coast birds have deposited guano only a few lines in thickness. This shows how great must have been the number of birds, and how many cenlew lines in thickness. This shows how great must have been the number of birds, and how many centuries must have passed over in order to form the present guano-beds." There seem to be three varieties of guano in Peru: the white, grey, and red. The red is the oldest deposit, and the white the most recent. Bones and festiners of birds, together with crystalline deposits, are found amongst the layers of excrement. A large portion of the so-called Peruvian guano is imported from the Chincha islands. These islands, which are three in number, are respectively about five or six miles in circumference, composed of granite, and covered with guano, in some places to a height of 200 feet. No earthy matter is ruixed with this great accumulation of excrement. During the last few years, the export of guano has increased considerably. Between 300,000 and 400,000 tons are the annual amount at present. A large number of men, many of whom are Chinese, are employed to remove the guano to the ships. They work their way through the mass with pickaxes, and leave a sort of wall on either side. It is then removed in wheel-barrows, either direct to the mouths of the shoots at barrows, either direct to the mouths of the shoots at the edge of the cliff, or to the house waggous running on tramways for the same purpose. With regard to the operation of guano as a manure, there has always been a good deal of discrepancy in the statements put forth as to its operation. There can, however, he little doubt that it is a very efficient manure. Its operation in Peru is seen in the conversion of the sandy desert near Lima into a soil capable of bearing large crops of maize. The Peruvians have a proverb concerning it, which sfillrms that "Huano, though no saint, works many mirscles." There are several commercial varieties of guano, the principal of which are
—Peruvian, Angamos, Ichaboe, Patagonian, Saldanha
Bay, Kooria Mooria, African, and Indian. In chemical
analysis, guano shows that one of the most, if not the most, important of its constituents is ammonia: some varieties contain from 17 to 20 per cent. Guano also contains potash and a considerable quantity of chloride ing the wood, either by boiling chips in salt water, of sodium (common salt). Next to the ammonia, the more commonly by burning kollow billets, and phosphoric acid seems to hold the place of importance, hing the resin as it flows out from them. It also the tree is cut or wounded in any way. Both the tree is cut or wounded in any way. Both cent. Good guano, when analyzed, is found to contain

#### Guarana

about 50 per cent. of ash or mineral substances, and 50 per cent. of combustible or organic matters. Good Peruvian guano is worth from £12 to £14 per ton. It is largely adulterated with umber, finely-ground stone, old mortar, and partially-decomposed sawdust. Instances have occurred when adulterating substances

Brances have occurred when admerating substances have been present in the proportion of 87 per cent.
GUARANA, or BRAZILIAN COCOA. (See PAULLINIA.)
GUARANTER, or GUARANTY, gar-rin-te (from Fr. garantir, to warrant), is a promise, or undertaking, to be responsible for the debts or duties of a third party, be responsible for the debts or duties of a third party, in the event of his failing to fulfill his engagement. To make such an obligation binding, there must be some good consideration moving from the party with whom it is made; as the delivery of goods to, or work to be done on credit for, the person on whose behalf the guaranty is given. It must be in respect of a contemporaneous, or future debt or act. If a guaranty be rude in respect of a debt blandy incurred these made in respect of a debt already incurred, there must be a new consideration to support it. A consimust be a new consucration to support it. A consideration, however, need not be expressed; for if it can be fairly implied from the circumstances, or the language used, it will ordinarily be sufficient. It is sufficient if the person for whom it is given receive a benefit, or to whom it is given receive, or may receive, a detriment. The Statute of Frauds enacts that a defendant cannot be charged to answer for the debt, default, or miscarriage of another person upon any special promise, uffices the agreement upon which such action shall be brought, or some memorandum or such action shall be brought, or some memorandum or note thereof, shall be in writing, and signed by the party charged therewith, or some other person duly authorized by him. This statute only applies, how-ever, to engagements in which the guarantor is only liable conditionally upon the default of some other person: where he is liable coextensively with the other

person: where he is liable coextensively with the other party in the first instance, it does not apply.

GUARD, gard (Ang.-Nor.), in Mil., the name applied to a body of soldiers charged with the care of prisoners, or the protection of baggage and military stores. A guard is always stationed at the entrance to a fortified town, citadel, or barracks. The number of men of which a guard is composed differs according to the rank of the officer, or non-commissioned officer, by whom it is commanded, or the purpose for which it is designed. There is always a room or separate building. party in the first instance, it does not apply.

Guer, gard (Ang. Nor.), in Mil., the name applied to a body of soldiers charged with the care of prisoners, or the protection of baggage and military stores. A guard is always stationed at the entrance to a fortified town, citadel, or barracks. The number of which a guard is composed differs according to the rank of the officer, or non-commissioned officer, by the rank of the officer, or non-commissioned officer, by set apart for the accommodation and protection of the set apart for the accommodation and protection of the guard, the men taking it in turn to perform the duties white, and the tail forked. The gudgeon swims in of sentry outside. When the general in command is passing, and on similar occasions, the whole guard is afford grest sport to anglers, from their greediness in passing, and on similar occasions, the whole guard is passing, and on similar occasions, we wante generally turned out and presents arms. A guard of hotour is a detachment on duty on special occasions, as a token of respect. The regiments which precede or follow an army or division on the march, at a short distance, are called the van-guard and rear-guard respectively. the old coaching days, a man known by this name always accompanied a coach, and was generally armed, for the better protection of the mails and articles of value. Every railway train is under the charge of one or two guards, who see that the time between station and station is correctly kept, and look to the safety of

and station is correctly kept, and to be savely or goods and luggage, and the requirements of passengers.

Guardian, gar-de-an (Fr. gardien), in Law, is one who has the care of the person and property of a minor, who is called his ward. He performs the office of both tutor and curator in the Roman law; the former having the charge of the maintenance and education of the minor, the latter the care of his fortune. Of the several species of guardians, the first are guardians by nature, namely, the father, and in some cases the mother of the child; for if an estate be left to an infant, the father is by common law the guardian, and must account to his child for the profits. There are also guardians for nurture, which are of course the father and mother, till the infant attains the age of fourteen years; and in default of father or mother, the

#### Guebers

The guardianship in socage ends when the minor attains the age of fourteen, when he may appoint his own guardian. Guardians by statute, or testamentary guardians, are such as are appointed in virtue of the statute 12 Car. II. c. 24, confirmed by 1 Vict. c. 26, which ensets that any father under age, or of full age, may by deed or will, attested by two winesses, appoint any person or persons (except a popish recusant), as may by deed or will, attested by two winesses, appoint any person or persons (except a popish recusant), as guardians of their children, either born or unborn, until they attain the age of one-and-twenty years. There are also special guardians by custom in certain places, as in London the guardianship of orphans under age and unmarried belongs to the city. The guardian is considered as a trustee for his ward, and is accountable for the due management of the infant's property, and is answerable not only for fraud, but for negligence or omission. Guardianship in chivalry, which was abolished by 12 Car. II. c. 24, was a part of the ancient foudal system, the lord being entitled to the wardship of the heir, if a male, until the age of twenty-one, or if a female, until fourteen. This wardship consisted in having the custody of the body and lands of such heir, without any account of the profits during that time. without any account of the profits during that time. If the female remained unmarried after fourteen, the lord might keep her in wardship till ahe was exteen, in terms of the statute of Westminster I., 3 Edw. I. c. 22. This guardianship being considered a property, rather than a trust, was saleable, and if not disposed of, passed than a trust, was saleable, and if not disposed of, passed at the lord's death to his personal representatives. Guardian of the spiritualities, is the person to whom the spiritual jurisdiction of any dioceae is committed during the vacaucy of the see; while the guardian of the temporalities is he to whom the temporal jurisdiction and profits of the see are committed during the like period. Guardians of the poor are certain persons appointed in a parish, or union of parishes, to act in lieu of overseers, and to superintend all matters relative to the relief and unpreparent of the poor. (See POOR LAWS)

Shoals, and feeds on worms and aquatic insects. They afford greeff sport to anglers, from their greediness in seizing upon any bait presented to them. They spawn in May, generally in shallow water, to which they repair for the purpose.

Guerre, Gherre, or Gavers, gwai'-bers (i. e. giaours, dogs, infidels), is a term applied by the Mohammedan conquerors of Persia to the disciples of Zoroaster in that country. They call themselves "Behendies," i. e., followers of the true faith, and are generally known by Europeans as fire-worshippers. Zoroaster is believed to have flourished in the 6th century B.C. In course of time the system became very tury B.C. In course of time the system became very corrupted, and King Ardeshir Babekan (a.D. 226) reformed it, collected the sacred books, and caused them to be translated from the Zend language into the mem to be translated from the Zend language into the vernacular dialect of Persia, and built temples for the preservation of the sacred fire. Under the Mohammedan invaders in the 7th century, they were much persecuted, and most of them embraced Islamian. A small rammant, who clung to their old faith, were finally allowed to settle in one of the most barren parts of the kindow. of the kingdom. They now number about 100,000 souls, dwelling chiefly in the city of Yezd and the province of Kerman. They have the character of being of the kingdom. industrious and virtuous, in comparison with the other Persians, but they are ignorant and depressed. A body of the Guebres left Persia at the time of the fourteen years; and in default of father or mother, the ordinary usually assigns some discrete person to take are of the infant's personal estate, and to provide for his maintenance and education. Guardians in socage take place only when the minor is entitled to some estate in lands, and then by the common law the guardianship devolves upon his next of kin, to whom the inheritance cannot possibly descend, for the law infant in judges it improper to trust the person of an infant in judges it improper to trust the person of an infant in sands who may by pssibility become heir to him.

Guillotine

siderable effect. They recognize one God, Ormuzd, invisible and omnipotent, the creator, governor, and preserver of all things. He sprang from primeval light, which emanated from a supreme incomprehensible essence, called Zernane Akerene, or the Eternal. Ormusd created a number of good spirits to act as the medium of his bounty to men, and intrusted them each with the guardianship of a particular person or object, animate or inanimate. The sun is the eye of Ormuzd, and, like all the heavenly bodies, is animated with a soul. The spirits of the stars have a beneficent in-fluence upon the affairs of men, and can reveal the future to those who understand their signs; hence astrology has always been a favourite subject of study with them. The worship of idols is prohibited, but a reverence for fire and the sun inculcated, as emblems of deity. To Ormuzd is opposed Ahriman, the author of evil. The sacred fire which Zoroaster brought from of evil. The sacred fire which Zoroaster brought from heaven is kept continually burning in holy places, and is fed with choice wood and spices. Their funeral ceremonies are very peculiar. Fasting and celibacy are considered as displeasing to the deity, and polygamy is strictly forbidden. Their priests pass their time in praying, chanting hymns, tending the fires on the altars, burning incense, and performing certain ceremonies. Prayer, obedience, industry, honesty, hospitality, and aims, are enjoined, while anger, revenge, envy, hatred, and quarrelling, are strictly forbidden. The precepts of this religion are contained in the Zend Avesta, or collection of sacred writings which Zoroaster received from heaven. The original was lost at aster received from heaven. The original was lost at the time of the invasion, but copies of it were preserved.

GUELDER ROSE. (See VIDURNUM.)
GUELPHIC ORDER. (See KNIGHTHOOD, ORDER

OF.)
GUELPES AND GHIDELLINES, gwelfs gib'-bel-lines, the names of two political parties that for several centuries during the middle ages continued to agitate the distance of the middle ages and Italy. The factions arose turies during the middle ages continued to agitate the countries of Germany and Italy. The factions arose in the contest for the imperial throne between Conrad, duke of Franconia, and Henry the Lion, duke of Saxony, of the house of Guelph, or Welf. At the great battle of Weinsberg, in Suabia, in 1140, the adherents of Henry adopted the war-cry of, Welf, while those of Conrad took that of Waiblingen, a seat of the Hoberstate for family to which coursed belonged. The Hohenstaufen family, to which Conrad belonged. terms were continued to designate the two parties, the latter becoming corrupted into Ghibellines. The house of Holenstaufen having become the ruling power in Germany, the name of Guelphs was given to all who were disaffected towards it, while the Ghibellines were those who supported imperial authority.

As Italy became the chief theatre of the contests of As Italy became the chief theatre of the contests of these two parties, and as the Church was equally opposed with the Guelphs to the imperial power, it took part with the latter, and at length the popes became the leaders of that party. In the 13th century, under the reign of Frederic II., it came to be a contest between the temporal and spiritual power; and Italy was divided, as it were, into two camps, some cities ranging themselves on the Guelph side, while others remained attached to the Ghibellines. The former were generally the more powerful in the south of Italy, the latter in the north. After the German emperors lost their powering Italy, the names of Guelph and Ghibelline lost their foriginal signification, and were applied to various contending factions among the Italians themselves. In general, the Ghibellines were regarded as aristocratical in their ideas, while the Guelphs were considered as entertaining popular views; but sometimes we find the reverse of this to be the case, the Guelphs being allied with the governing party and the Ghibellines forming the really popular party. In 1334 Pope Benedict XII. forbade, under pain of the censures of the Church, the use of these once potent names; and in the following century they were generally the more powerful in the south of Italy, pain of the censures of the Church, the use of these once potent names; and in the following century they had become a mere traditional shadow.—Ref. Sismondi's History of the Italian Republic; Raumer's Geschichte der Hohenstaufen.

GURBILLA, gwer-ril-lä (Sp., a little warfare, from march, war), is a name applied in Spain to armed freasants or others who keep up an indepentant of hostile attacks upon an enemy. This harassing an enemy is particularly effective 992

in a mountainous or close country, and was adopted towards the French armies in the north of Spain during the peninsular war. The bands which conducted this desultory warfare were called partidas. In the recent civil wars which have distracted that

In the recent civil wars which have distracted that country, the guerrillas have borne a prominent part. Guerraeda, gat'-tar-dā (after Dr. Guertard, a French botanist), in Bot., a gen. of the nat. ord. Cinchonacea, a native of the West Indies, is the tree from which the beautiful zebra-wood of the cabinet-

makers is obtained.

GUILD, gild (Sax. guildan, to pay), is a society or body of individuals associated together for carrying on commerce, or some particular trade or business. Each member contributes towards the expenses; and hence the name. There existed at Rome various fraternities of tradesmen, which bore a considerable resemblance to our modern guilds, and were permitted to regulate their affairs by their own laws; but it is usual to trace the origin of guilds to the middle ages. Mechanical industry would never have flourished under the feudal system, had it not been for the unions formed among the workmen and merchants themselves. When the advantages of these associations became known and felt, they rapidly increased, and in the struggles between felt, they rapidly increased, and in the struggles between the citizens and nobility, the principal resistance against the latter was made by the guilds or corporations. As soon as the citizens acquired an influence in the ad-ministration, the guilds became the basis of the muni-cipal constitutions, and every one who wished to par-ticipate in the municipal government was obliged to become member of a guild. Hence we so often find distinguished individuals belonging to a class of me-chanics, of whose occupation they probably did not distinguished individuals belonging to a class of mechanics, of whose occupation they probably did not know anything. Guilds introduced the democratic element into society, and in their progress became the bulwarks of the citizen's liberty, and the depositaries of much political power. By the close of the 12th century, merchants' guilds were general throughout the citize of Europe. The drapers' company of Hamburg dates from 1153, and that of the shoemakers of Magdeburg from 1157. With the increase of their wealth and strength, the guilds either purchased or extorted deburg from 157. With the increase of their weath and strength, the guids either purchased or extorted from their rulers privileges, which, once obtained, they were careful never to give up. By the 13th century, they had acquired considerable power, and in the two succeeding ages they counterbalanced the power of succeeding ages tasy control danced the power of fine nobles. By degrees, they themselves grew into intolerable aristocracies, especially in Germany, where their exactions had to be curbed by the laws of the empire. Guilds were abolished in Prussia in 1810; but the want of such associations having since been felt, laws were enacted in 1840 to favour their re-establishment. In France, they were suppressed in 1776, but soon re-established, and not finally abolished till 1791. In England and Scotland, the exclusive privileges of the guildry companies have now been abolished.

the guilary companies have how been aboushed.
Guildhall, gild-hawl, is an important public building of the city of London, the seat of the municipal government, and the place of its civic meetings. Various courts are held here; and here, every 9th of November, the new lord mayor for the coming year cives a grand public dinner, at which her meisetr's November, the new lord mayor for the coming year gives a grand public dinner, at which her majesty's ministers and the great law officers of the crown are invariably present. This building was commenced in 1411, by contributions of several companies called guilds, aided by liberal donations from many private individuals. Of the original Guildhall little now remains but the stone and mortar of the walls, it having suffered greatly by the great fire of 1666. It was patched up by Wren, and again in the last century by

patched up by Wren, and again in the last century by Dance, who, in 1789, erected the present intensely barbarous front. The apartments contain some paintings and sculptures, but of very ordinary merit. The library contains a very large collection of early-printed plays and pageants, &c., connected with the city.

GUILLOTINE, gill-lo-leen, is the name of an instrument used for the indiction of capital punishment by decapitation. In general form it usually consists of two upright posts surmounted by a crossbeam, and grooved so as to allow an oblique-edged knife with a heavily-weighted back to descend surely and swiftly, when the cord by which it is suspended is let go. The instrument took its name from Joseph Ignace Guillotin, a physician in Parf, who was a member of

the French National Assembly at the time of the Revolution, and proposed its adoption by the Assembly. This name, however, was bestowed upon it in derision and santiapation, and clung to it, in spite of an attempt to call it the Louison, after M. Louis, the secretary of the College of Surgeons, who actually presided over the construction of the machine, which Guillotin had only indicated. Its adoption was proclaimed in a decree of March 20, 1792. Dr. Guillotin sank into ridicule and contempt, and after being imprisoned during the Jacobin reign of terror, was released at the gaodelivery on the 9th Thermidor, and died in his bed, in delivery on the 9th Thermidor, and died in his bed, in Paris, at the age of 76. It is a common error to sup-pose that he fell a victim to his own invention. To attribute the invention of the guillotine to Dr. Guillotin is also a mistake. It had been in use for centuries in Germany, in England, Scotland, and Italy. In Germany, the instrument was called der Planke der Diel, the plank of wood, and, in older language, Fallbeil, the falling hatchet. The English mode of decapitation had always been by the block and axe, with one local expansion.—that of the Halling stiket, which was local exception,—that of the Holifux gibbet, which was a perfect guillotine. Its use at Halifax is traced as far back as the reign of Edward III. the last crimifar back as the reign of Edward III.: the last criminals who suffered by it were executed in 1650. In the museum of the Antiquarian Society of Edinburgh, a rudely-shaped guillotine, called "the Maiden," is still preserved. The regent Morton was beheaded by this machine. Pennessik, in his "Description of Tweeddale," in speaking of the regent, says, "This mighty earl, for the pleasure of the place and the salubrity of the air, designed here a noble recess, and retirement from worldly business, but was prevented by his unfortunate and inexorable death three years after, A.D. 1581, being accused, condenned, and executed by the Maiden at the Cross of Edinburgh, as art and part of Maiden at the Cross of Edinburgh, as art and part of the murder of King Henry, earl of Darnley, father to King James VI., which fatal instrument, at least the pattern thereof, the cruel regent had brought from abroad to behead the laird of Pennecuick of that ilk, who, notwithstanding, died in his bed, and the unfor-tunate earl was the first himself that handselled that tunate earl was the first himself that handselied that merciless Maiden, who proved so soon after his own executioner." A machine was also used by the Italians which closely resembled the guildotine. It was called Mannia; and an engraving of it, as used in Italy, is to be seen in the Questiones Symbolicae of Achilles Bocchius, printed at Bologna in 1555. The eighteenth symbol in this work represents a Spartan about to deep by a kind of guillotine. In Louis Cranach's woodcuts of the "Marryrdom of the Anostles." urited in 1539. symbol in this work represents a Spartan about to die-by a kind of guillotine. In Louis Cranach's woodcuts of the "Martyrdom of the Apostles," printed in 1539, there is a representation of the death of St. Matthew by the guillotine, with a legend to this effect, "It is said that his head was chopped off by a falling-axe (fallbeil), after the manner of the Romans." The guillotine was not, therefore, a new instrument when it was adopted by the French. After being in exer-cise for a few months it became the delight of the cise for a few months, it became the delight of the Parisian mob; and not of the mob only, for it was canonized in the philosophical rubric as la Sainte Guillotine, and, in miniature, became the model of ornaments for women and toys for children. During the period

the name is still used to designate a sum of twenty-one shillings; and it is outlomary to recken professional fees, voluntary subscriptions, &c., in guiness, which is supposed to raise them above mere pounds shillings

and pence transactions.

GUINEA CORN. (See HOLOUS.)

GUINEA-FOWL. (See FOWL.)

GUINEA-FIG, Caria codaya, is an animal of the gen.

Rodentia, a native of South America, but which is now quite domesticated in Europe. From the beauty of its appearance, this gnimal seems to have attracted the attention of Europeans. It is one of the species called agouts, which are well known in South America and the West-India islands. Its ears are large and broad; the upper lip is divided in two, and the hair or fur is erect, and somewhat resembling that of a pig (whence erect, and somewhat resembning unation a programmits name). The colour of the guinea-pig agenerally white, with black spots, although this is somewhat variegated by orange shotches on the coat. It has divors not be fore legs and three on the bind ones, and is utterly destitute of any caudal appendage. In the short of the colour of the c is utterly desitate of any caucal appendice. In any about 50 miles apps are extremely neat, as they are of standy seen smoothing and arranging the hair work forms the outer regiment of their cost. Their work voice is a grunt or feeble squeal, which remarks even more analogous to the pig, to which they are aften likeand. The guines mig, is its wild state. often likened. The guines pig, in its wild state, inhabits dry sandy places, and its flesh is esteemed a great dainty by the natives of South America.

great dainty by the natives of South America.

GUITAR, gii-tar' (Fr. guitars', a musical stringed instrument, supposed to have originated in Spain, where it is very common; indeed, so much so, that there are few, even of the poorer classes, who cannot play on it, while geattlemen employ it to seronade their mistresses. About the middle of the last century it instresses. About the mindio of the last century it became so popular in England as to greatly injure the sale of other instruments. The demand for it is said to have been greatly lessened by Mr. Kirkman, a manufacturer of harpsichords, who having bought a number of cheap guitars, distributed them to balladsingers, at the same time teaching them to play a few singers, at the same time teaching them to play a few easy times, thus rendering it so common that fashionable people threw it by in disgust. The guitar is of a somewhat oval form, having a neck similar to that of the violin. The strings—six in number—are stretched from the bead to the lower end, spassing over the sounding-hole and bridge. The three first, E, B, and G, are, like the gut strings of the violin, called the strelle; and the other three, which are of gut or silk. treble; and the other three, which are of gut or silk, and wound with silver wire, constitute the bass. All the strings are tuned by fourths, except the third, which is tuned one third below the second,

Gules, gules (Fr. yurules), in Her., the term used to denote a red colour in armorial bearings. In engrav-ings of coats-of-arms this colour is expressed by parallel lines crossing the field or charge in a perpendicular

GULF STREAM. (See OCRAN CURRENTS.)

GUID-WEED. (See SARGASSUM.) GUIL, gult (Welsh guylon), is a Linnean species of aquatic birds, belonging to the longinenuse division of Palmipedex in Curier's system. The birds of this webfor women and toys for children. During the period for well-known marine genus are dispersed over every part of the globe, and in some places, at certain seasons of the year, are met with in multitudinous quantities. Their characteristics are as follows:—A strong straight bill; the body classed with a great quantity of down and haked above the knees, and the feet are webbed. The guils, which are seen on the different coasts, mostly assemble in flocks, and are characteristic by the red great red with a great quantity of down and naked above the knees, and the feet are webbed. The guils, which are seen on the different coasts, mostly assemble in flocks, and are characteristic by the red great red with a great quantity of down and naked above the knees, and the different coasts, mostly assemble in flocks, and are characteristics. Their characteristics of the guils

shoals which frequent the waters round our coasts. The gull is avery courageous bird, and there are many anecdotes related of the encounters witnessed between it and some large fish, which it has selected for a prey, it and some large fish, which it has selected for a prey, but which proves too strong for its assailant. The black-backed gull, the ivory gull, and the horny gull have but little distinction from the common gull. The skua gull is about the size of a raven; the back and head, and upper parts of the body, are of a deep brown colour, the under parts pale ashy grey; the legs black, and the talons very strong and hooked. It is a native of the North, although occasionally found in England. It is a very formidable bird, partaking of the fierceness of the eagle, and not only feeds on fish, but it also preys on lambs and other small animals. In the Shetland isles, and in other northern rock-bound coasts, it is seen often. The arctic gull is very similar to the common often. The arctic gull is very similar to the common gull, and needs no special description. It is found in guil, and needs no special description. It is found in northern regions,—whence its name, and it is peculiar only from the fact of its parasitical propensities. It ever fishes for itself, like other water-lowl, but puranes smaller guils which have captured any booty, is smakes them drop it. It then descends with great praying, and catches its stolen prey before it can praying water.

GULEAT. (See (ESOPHAGUS.)
GULEAT. (See (ESOPHAGUS.)
GUM, gum (Sax. goma), in Anat., is that cellular and
elastic fleshy substance which covers the alveolar portions of the upper and lower jaw, and envelops the
neck of the teeth.

Gun, gam (Fr. gomme), a vegetable product, which forms a slimy solution with water, but is insoluble in alcohol, ether, and oils. There are six varieties of alcohol, ether, and oils. There are six varieties of gum,—gum arabic, gum Benegal, gum of the oherry and other stone-fruit trees, gum tragacanth, gum of Bassora, and the gum of seeds and roots. All these gums, except the last, flow spontaneously from the branches and trunks of their trees, and sometimes from the fruits, in the form of a mucilage, which dries and hardens in the air; the gum of seeds and roots, however, requires to be extracted by boiling water. A number of very different substances are confounded in commoree under the name of gum. Thus, gum elemind gum consl. which are true resins: gum acomoniaand gum copal, which are true resus; gum ammonia-cum, which is a gum-resin; and gum elastic (caout-chouc), which differs from both, are all called gums. Gum arable is obtained from the Acacia arabica; or and hollow on the other. It may be bleached by exposure to the atmosphere and sunlight at a temperature of 212°. Its specific gravity is 1°35°. It is used in medicine, and also in order to give lustre to crapes and other silk fabrics. Gum Senegal is collected from the Acacia Senegal by the negroes during the month of November. Its specific gravity is 1°436, and its chemical properties and uses are similar to those of gum arabic. It is largely used in calco-printing. Gum tragacanth is gathered in Crete and the neighbouring islands. From the Academ Tragacanth about the tragacanth is gathered in Crete and the neighbouring islands, from the Astragalus Tragacantha, about the end of June. It is white or reddish in colour, almost opaque, and has the appearance of twisted ribands. It is difficult to pulverize it without heating the mortar. When plunged into water, it partially dissolves, swells, and forms a very thick mucilage. (Junt 1792, 1892) swells, and forms a very tinck mucliage. Clim tragacanth has a speake gravity of 1'384, and is used in calico-printing and by shoemakers. (For other gums, see Bassora Gum, Britter Gum, Drithin). Most of the substances called gums are resins or gum-resins. Gum-both, in Surg., is a small abscess, which forms in the cellular substance of the gum. At first it is sufficiently until the protect it against cold, but if it.

in the cel'llar substance of the gum. At first it is sufficient, the only to protect it against cold; but if it party and the dynamot, the process of ripening may be party. In 133 t applications to the cheek, next to the pain of the the pain be excessive, a leech applied to none pote will usually afford relief. As soon as the had be so of matter can be ascertained, it should be let mon, a free incision.

Of the interior plants, obtained by sportaneous exceptions of sesin and gum, the proportions varying in the different varieties, and with these are commonly associated essential oil and other vegetable substances,—
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as starch, bassorin, extractive, &c. They are most of them hard and dry substances, brittle and opaque, rarely translucent like the resins. Some that are rarely translucent like the results. Some that are semi-liquid and viscid, as the sagapenum and galbanum, become hard in very cold weather, and may then be pulverized. At a moderate heat these are sufficiently fluid to be strained through a cloth; and all the gum-resins may be thus strained and purified by first boiling them in water. They are partially soluble in water or in alcohol, and wholly so in a mixture of these. Polaran are all distantibled force provinces. these. Balsams are distinguished from gum-resins by containing benzoic acid. The most important of the gum-resins are aloes, ammoniac, asafœtida, bdellium, euphorbium, galbanum, gamboge, myrrh, olibanum, sagapenum, sad scammony, all of them being of great service in commerce and industry.

GUM-TREES. (See EUCALNITUS.)

GUN, gun (Ang. Sax.), an instrument consisting of a barrel or tube, of iron or other metal, from which balls, shot, or other missiles are discharged by the explosive force of gunpowder. The larger species of guns are called cannon; the smaller species are called fifles, muskets, carbines, fowling pieces, &c. The manufacture and construction of cannon have been fully described in the articles on ARTILLERY and CANNON, to which the reader is referred. A description of the latest improvements in the manufacture of small fire-arms will also be found under the head RIFLE. The ordinary muster or fowling-piece consists of two distinct parts,—the metallic and the wooden part. The first comprises the barrel, the lock, and the mounting, together with the bayonet and ramped for military arms; the second comprises the stock, and, in fowling-pieces, the ramrod also. The interior of the barrel is called the hore, its diameter the calibre, the front end the muzzle, and the back end the breech. front end the muzzle, and the back end the breech. The proving of gun-barrels is indispensably necessary to insure confidence in their safety. Next in importance to the barrel comes the gun-lock. Formerly all guns were made with fint locks, working with a spring; but at the present day percussion or detonating locks only are used. Among the most important technical terms employed by sportsmen to distinguish the different parts of a gun are the following:—The butt of stock, the shouldered extremity of the stock; the chain or swivel, a small catch suspended from the neck of the tumbler, to receive the extremity of the mainspring; Acacia arabia is obtained from the Acacia arabica, or tumber, to receive the extremity of the mainspring; Acacia arabica, acacia arabica, acatia cavity within the breech, to reand in Arabia. The commercial gum of this kind con-feeive the powder; the cock in the flint gun holds the sists of a number of small pieces rounded on one side flint in its jaws, and in the percussion gun is often and hollow on the other. It may be bleached by expocalled the striker; the guard, the bow which protects sure to the atmosphere and sunlight at a temperature the trigger; the heel-plate, the plate with which the of 212°. Its specific gravity is 1°355. It is used in meprincipal works of the lock; the mainspring works the tumbler with the cock; the scear, that which catches the tumbler for half or whole cock, on being pushed up by the trigger; the tumbler, the movable centrepiece of a lock, which falls into, and is subservient to, the cock; the worm is the screw at the end of the

io, the cock; the worm is the screw at the end of the ramrod.

GUN, AIR. (See AIR-GUN.)

GUN, AIR. (See AIR-GUN.)

GUNGAT, a term formerly applied to a small vessel mounting only a single gun, and used for coast defence; but now the word gunboat is synonymous of a totally new class of vessel. The experience of the last Russian war showed us that vessels of light draught of water, which could be rapidly propelled through the sea, and which could carry one or two guns of large calibre, would be far more useful sometimes than line-of-battle ships; accordingly, our fleet of gunboats was constructed on entirely new principles. They are generally armed with one 68 or 100-pounder Armstrong gun, which can be used either ahead or astern, according as required. Some have in addition to this, a 32-pounder, or brass howiteers. They are propelled by engines of from 20 to 80 horse-power. In the new gunboats constructed the crew are sheltered by shifting iron screens, and the vessels themselves are plated externally with armour-plates. Their rig is restricted to a very light form, and consists of three masts, very short in length, and fitted only with gaff-sails.—Ref. The Screw Fleet of the Navy, by Captain Halsted, R.N.; Eng. Cyclopædia—Arts and Sciences, and the Cyclopædia Britannica.

GUN-COTTON. (See Pyroxxiline.)

GUN-COTTON. (See PYROXYLINE.)

### Gun-Metal

GUN-METAL, in Metall, an alloy containing 90 5 per cent. of copped and 9 5 of tin, used for casting pieces of ordnance and those parts of machinery which are subjected to considerable friction.

GUNNER, gun'-ner, in Mil., a name applied to soldiers belonging to the royal artillery, in contradistinction to those who are called drivers. Some artillerymen rank as master gunners, and there are others attached to the corps and considered as forming a portion of it, termed invalid gunners. In the royal namy the gunner holds the highest rank among warrant officers. Gunners in the navy are divided into three classes, with pay varying from £10 to £7 per month when at sea, and from £8, 10s, to £5, 10s, per month when in harbour. The gunner must be a man of when in narrour. The gunner must be a man of tolerably good education, and has to pass a severe examination before he is considered as qualified to enter on the duties of his post. Whenever a gunner returns from service abroad, he has to go on board the Excellent gunnery ship at Portsmouth, to make himself accounted. himself acquainted with the latest improvements in the science. On board ship the gunner and his mates have to instruct the midshipmen and ship's crew in the great-gun, small-arms, bayonet, and cutlass ex-ercise; and the chief gunner has the charge of the magazine, and serves out the ammunition and military stores, keeping a strict account of the expenditure. He must necessarily have a knowledge of geometry, and also be acquainted with the duties of practical seamanship. He has to superintend the fitting out of boats for active service. Gunners hold rank next to second masters. Although holding a position of such importance, the gunner is one of the worst paid officers in the British service. When he is no longer fit for service, he is allowed to retire on a small pension, averaging about 445 a year, and if he die on active service, his widow is also entitled to a pension of small amount.

GUNNERA, gun'-ner-d (after Ernest Gunner, a Norwegian botanist), in Bot, a gen, of the nat. ord. Arabacev. The species G. scabra, a native of Chili, is remarkable for its enormous leaves, which are sometimes eight feet across. Its fleshy leaf-stalks, which resemble those of the rhubarhs in appearance, are eaten. Its roots are astringent.

Gunner, gun'ner-e, the science which treats of the theory of the flight and motion of projectiles discharged from cannon and small-arms, and teaches the method of employing these weapons in the most effectual manners for the purposes of attack and defence. The earliest treatise on the path described by a projectile during its flight, seems to be one written by a mathematician mamed Sartalea, about the middle of the 16th contury. Galileo demonstrated that a shot fired from a gun would trace a parabolic curve in its passage through the air, if the resistance of the air had no influence, as it has, in materially altering the form of the path it describes. It will be readily understood, that if the resistance of the air and the attraction of gravitation could be removed, or, in other words, if a shot could be fired in vacuo, it would go on for ever in a line corresponding to that of the axis of the piece, produced indefinitely, with the same initial velocity, or the velocity which it possessed when it left the cannon's mouth. But supposing the effect produced by the influence of the air to be neglected, and gravity alone to act on the ball, it is found that the action of gravitation constantly acting on the projectile at every point of its flight, in a line which may be densidered as perpendicular to the horizon, tends to draw it out of the straight line, which it would have described if the force of gravity did not exist, and eventually brings it to the ground, after describing a parabolic curve. It was generally considered by mathematicians, from the time of Galileo, that the path of a projectile was that of a parabola, and that the resistance of the air had but little, if any influence, in altering its form; but it was reserved for Newton to show that its true path, under the combined influence of the resistance of the air and the attraction of gravitation, was that of an hyperbola while passing through a medium offering a uniform resistance. He also showed that the resistance of the bair had but little, if any

### Gunnery

ters and the density of the medium through which ters and the density of the medium through which they pass. To determine and calculate the time of flight, the horizontal range, and the greatest height to which a shot will rise during its light, requires a knowledge of trigonometry. It may, however, be said, that the range and time of flight depend entirely on the charge and the elevation of the gim. The greater the charge, the greater will be the range and the velocity invented to the above the coercity notice and the imparted to the shot up to a certain point; and the same holds good with regard to elevation, provided that the same charge be used in firing each shot, at the different elevations. A knowledge of the time in which a projectile will describe its flight is most necessary, a projectile will describe its flight is most necessary, especially in firing shells, that the gunner may know how to regulate the length of the fuse, to insure the bursting of the shell at the time of reaching the object at which it is discharged. This is taught by the study of gunnery, which also makes the military engineer acquainted with the effect produced by shot engineer acquainted with the effect produced by shot engineer acquainted with the effect produced by shot when discharged in masses, and for a long time against wood, stone, and other materials, under various circumstances; and gives him data for the construction of walls bomb-proof roofs, and vessels of sufficient strength to offer effect at resistance to the weight of the projectiles that may be directed against them. effect of the resistance of the atmosphere to the motion of a projectile is one of the most important sections of the science of gunnery. It has engaged the attention of some of the most eminent philosophers, both in ancient and modern times, on account principally of the great difficulty of determining, by experiment, the correctness of any particular hypothesis. Much difference of opinion is entertained as to the absolute effect of this retailing function of the product of the prod of this retarding force (which is, in fact, the science of sero-dynamics) upon bodies moving in the atmosphere with great velocities; and although sufficient is known to guide the practical gunner, still, as a scientific question, it is one of considerable interest, from the fact of tion, it is one to considerable interest, from the base of its practical importance. Dr. Hutton, in his "Mathematical Tracts," draws the best hypothesis on the subject; and although some of his results have been disproved by experimentalists who have inquired into the theory, and tested its results, since the time of Dr. Hutton, yet his deductions being generally found correct, are by far the most trustworthy to follow by any one who wishes thoroughly to investigate the science of aero-dynamics. The resistance which a body meets with in its motion hrough the air will first depend upon its velocity, and the form and magnitude of the surface opposed to the the form and magnitude of the surface opposed to the fluid; secondly, upon the density and tonacity of the fluid; or cohesion of its particles, and also upon the friction which will be caused by the roughness of the surface of the body; and, thirdly, upon the degrees of compression to which this fluid, supposing it to be perfectly elastic, is subjected, as on this depends the rapidity with which it will close in and fill the space behind the body in motion. With regard to the velocity of the body, it is evident that a plane moving through a fluid in a direction perpendicular to its surface must impart to the particles of the fluid with which it comes in contact a velocity equal to its own; and from this cause alone the resistances should be in the proportion of the velocities; but the number of particles struck by the moving body in a certain time being also as the velocity, it follows from these two causes combined, that the resistangem a fluid to a body in motion, which arises from the inertia of the particles of the fluid, will be in the due proportion the square of the velocity imparted to the mo the square of the velocity imparted to the mo body. Secondly, a body moving in a fluid must come the force of the cohesion of those parts w come the force of the cohesion of those par-separated, and the friction; both of which totally independent of the velocity. The ance, therefore, from cohesion, friction will be partly constant and partly as the velocity. Besides, the number of pa-the number that are separated will of the medis;—from which we dry mula :- Let d represent the der mula:—Let d represent the velocity of the moving body, a inertia, and b the coefficient then ado\* + bd will be resistance. The resistance squares of the velocity

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squares of the velocities multiplied by the densities in different fluids. Thirdly, if the body can be moved so rapidly that the fluid cannot instantly rush in behind rapidly that the fluid cannot instantly rash in behind it, as is found to be the case in the atmosphere, the resisting power of the medium must be considerably increased; for the projectile being deprived of the pressure of the fluid on its hind part, must support on its fore part the whole weight of a column of the fluid, over and above the force employed in moving the portion of the fluid in contact with it, which force is the sole source of resistance in the discontinued fluid. Also, it must be added, that the condensation of the air in front of the body will influence considerably the relation between the resistances and the velocities of relation between the resistances and the velocities of an oblique surface; and it is probable that, although an oblique surface; and it is probable that, although the resistances to a globe may, for slow motions, be nearly proportional to the squares of the velocities, they will, for great velocities, increase in a much higher ratio. The recoil of a gun must necessarily diminish the velocity of its projectile; and this has been exercilly borne in mind by men who have made ganney their especial study, as Sir William Armatrong and Mr. Whitworth. It must be also remembered, that the increased extent of range and the greater certainly of hitting the object against which the firing is directed, is due to the method of rifling or grooving the interior of the bore of the piece, which imparts the interior of the bore of the piece, which imparts rotation to the missile after it has left the muzzle of the gan. The use of elongated shot and shell also contributes greatly to this result, as they do not present a greater amount of surface to be acted on by the air than apherical shot; but, in consequence of their air than spherical shot; but, in consequence of their greater weight, they possess a far greater power of maintaining their initial velocity. It is difficult to treat on such a subject in a satisfactory manner without entering fully into details; and this renders it manifestly impracticable to do more in the present instance than to give the briefest sketch of the objects and nature of the science of gunnery, the theory of which belongs entirely to the higher branches of mathematics.—Ref. Robins's New Principles of Gunnery; Hutton's Mathematical Tracts; Sir Howard Douglas's Treatise on Naval Gunnery; Boxer's Treatise on Artillery. tive on Artillery.

GUNFOWDER, gun'-pow-der, a mixture of nitre, char-coal, and sulphur, in proportions which very slightly in coal, and sulphur, in proportions which very slightly in different sountries, and according to the uses to which it is applied. Its action is dependent on the rapid oxidation of the charcoal by the nitre, and the suddery evolution thereby of heated gas. The powder which appears to have the greatest propolling force is that which contains an equivalent of nitre and sulphur united to three of carbon. Many other chemical detonating compounds have been proposed, but none of them are equal to gunpowder as at present manufactured; the principal objections to their use being the comparative dancer attendant on their manufacthe comparative danger attendant on their manufac-ture and transport, and the too sudden evolution of gas at the time of their ignition. The following table contains the composition of most of the varieties of

gunpowder :-

OB. see 1

Bogland	Nitre75	Charcoal, 15	Sulphur. 10.
France Prussia	75	12.5	12.5
United States Austria Sweden	75 75	11·5	12·5 16·
n China	75	14.4	9.6

be dried in any one stove or place at any one time (altered by 23 & 24 Vict. c. 130, to 50 bs. and 50 owt. respectively; which aut also declares the quantity to be pressed at one time not to exceed 10 owt., or the quantity to be corned 12 cwt. In terms of this sot there must be a store maguzine of brick or stones at least 140 yards distant from any house used in making powder. No dealer is allowed to keep more than 200 powder. No dealer is allowed to keep more than 200 lbs., nor any person not a dealer more than 50 lbs., except in licensed mills, or to the amount of 300 lbs. for the use of collieries, and within 200 yards of them. By 23 & 24 Vict. c. 130, not more than 30 barrels are to be carried at once by land carriage, except in an in-closed wooden van, which may contain 40, or if it form part of a railway train, it may contain 100. Not more than 500 barrels at once to be conveyed by water, except in vessels importing or exporting, or going coastwise. All gunpowder must be contained in wooden boxes or in All gunpowder must be contained in wooden boxes or in barrels, without any iron about them, and well secured, each box containing not more than 100 lbs. Carriages must be completely covered over, and vessels used must have a close deck. To smoke, have fires, lighted candles, or lucifer matches, on such vessel, while the hatches are open, involves a penalty of £5. The exportation of gunpowder may be prohibited at any time by proclamation, or by an order in council. Stringent regulations are enacted by the last-mentioned act regarding the making of percussion-caps, ammunition, freworks, fulminating mercury, and other explosive fireworks, fulminating mercury, and other explosive compounds. Manufacturers must take out licenses, and not make percussion-caps or fireworks within 50, and not make percussion-caps or interorise within 50, or ammunition, full-ministing mercury, or other such article, within 100 yards of any dwelling-house or other manufactory. Not more than 50 lbs. of gampowder or 30 lbs. of explosive compound to be in the respective buildings at one time. To sell fireworks without a license are a parameters and a single property and a sinclusive and a single property and a single property and a single

Dillicense, or to a person apparently under sixteen years of age, involves a penalty of £5.

GUNFOWDER PLOT, the name of a conspiracy formed in the second year of the reign of James I. (1604), for the purpose of destroying the king and the parliament at a blow. The Roman Catholics having been disappointed in the grantities of individual to the grantities. pointed in the expectations of indulgence from King James, Catesby and Percy, two Catholic gentlemen of ancient family, with a few others of the same persussion, determined to run a mine below the hall in which parliament assembled, and on the first day of the session, when the king and royal family would be present, involve the whole in cae common ruin. A house close to the old palsec of Westminster was hired by Catesby, and mining creations commenced; but they were obliged to be abandoned. A rault below the House of Lords, which had been used to store coals, heing to let, Catesby hired it March 25, 1605, as being admirably suited for their purpose, and two hogsheads and by studed for their purpose, and two nogeneous and 38 barrels of gunpowder were lodged in it, the whole being covered with sticks and faggots, and the doors thrown open, so as to prevent suspicion. Everything was at length prepared for the set the control of the plot, which was arranged for the 5th November, the day on which was been as the control of the control was arranged for the 5th November, the day on which parliament was to be reopened. An anonymous letter was sent by one of the conspirators to Lord Konteagle on the 26th October, advising him not to attend the opening of parliament; "for God sad man hath concurred to punish the wickedness of this time." This be communicated to the secretary of state, Lord Salisbury, who, although apprehending nothing, thought proper to lay it before the king. James saw the matter in a more serious light, "and judging that the threatened dancer was from gunpowder, ordered the matter in a more serious nignt, wat junging these are threatened danger was from gunpowder, ordered the cellars beneath the parliament house to be searched. There is good reason for believing, however, that Montesgle and James were cognizant of what was going on before this time, and that the letter and this account of the matter was not in fur the automate. going on before this time, and that the letter and this account of the matter were got up for the purpose of concealing the treachery of some of those concerned. The vault was searched on the evening of the 4th November, and Guy Fawkies, an officer in the Spanish service, who was to fire the mine, was found at the door, with a dark lantern, and matches is his pocket The other conspirators fied to Holbeach House, is Worcestershire, where they were attached on the Ste

#### Gunshot Wounds

en the 5th of November, in commemoration of the deliverence of the nation from the perils of the Gunpowder Plot.

SURBOY WOUNDS, gun-shot woonds, is a term em-ployed in Mil. Surg. to denote wounds produced by earnon-balls, sullets, &c., striking against the body. They differ in many respects from ordinary wounds, and constitute a distinct branch of science of themsnd constitute a distinct branch of science of mem-selves. Frequently, on a person being struck, he is not-conscious of any pain, and he is first made aware of his wound by insbility to use the park, or by feeling the shoot trickling down. Generally, if the wound be at all severe, the patient becomes deadly pale, frem-bles and saying about to die, but would with the sid bles, and seems about to die; but usually, with the aid of stimulants, these appearances pass off in a few hours. If they continue unabated, they give reason to fear the worst. It was long a generally received spinion that a person might be injured by the "wind of a shot," without being struck by it at all; but this idea is now exploded, for persons have had portions of their clothes carried off by large shot, and even their sars or noses shot off without at all suffering from the wind of the shot. The real cause of such injuries wind of the shot. The real cause of such mignries is a ball whose force has perhaps been somewhat spent by previous obstacles, striking the part obliquely, and then glancing off, not breaking the elastic skin, but breaking or bruising the parts underneath. When a ball enters the body, the wound appears somewhat smaller than the ball itself; its edges appears somewhat smaller than the ball itself; its edges are ragged and invested, and the part around has a bluish or black colour from the bruise. When it passes irrough the part, the specture by which it makes its exit presents quite a different appearance. It seems somewhat larger than the ball, the edges are everted, and there is little-discoloration about the wound. Frequently a ball, if it enter obliquely, or be nearly ipent, instead of pursuing a straight course, becomes leflected, and may be found lodged in, or may pass out it a part at a considerable distance from that at which t entered. One is said to have passed completely ound the neck, and to have been found close to the sperture by which it had entered. Excessive bleeding s not so common after gunshot wounds as after other rinds; but it sometimes occurs, and may be fatal if not ittended to. Where it can be done, the finger should se inserted into the wound, and pressed upon the vesiel, otherwise a handkerchief should be tied very tightly Lthe limb above the wound. It is well to examine

and as early as possible, in order to ascertain mount of injury; at least, so far as this can be without aggravating the case. The ball or other gn substance ought to be removed, if that can be effected; but otherwise they ought, in the mean be let alone. As the walls of the wound slough arate, the opening will become larger, and hen fall cut, or be easily removed. Some-remain embedded in the tissues, without much or any inconvenience. If, after the id suppuration, the ball accounts fixed, and atton continues to be excited, and abscesses ts track, then it may be necessary to find and use every means to remove it. The sings should only at first be applied to the piece of linen, spread with some mild ointtipo of their, system with some mind one tipo of a fag. kept. constantly moist with cold Aprilent medicine should also be given, and a times it is advisable to bleed the patient. After a

wdays, when suppuration has set in, the treatment hould be changed, and in place of the cold application, both os that get, and in place of the cold application, one warm emolitent poultice, or list dipped in warm ster, should be adopted, and the system strengthened mild tonics and a nutritious diet. The inflammation nich precedes suppuration is usually very intented normanied with great swelling, heat, and pain of sompanied with great sweaking, near, and pain of surrounding parts, and severe constitutional disbance, fever, sleeplosaness, &c. These symptoms are when suppuration is fairly established, the surading inflammation is lessened, the fever subsides, in slight cases the health may seem but little ted. In severe cases, however, hectic fever superand the best of the series of

### Guttifere

may have been injured by the ball. In such a case, the vessels must be out down upon, and fied both above and below the opening. In cases where the parts beneath are greatly bruised, but the skin itself is not broken, it is recommended to make one of two invisions, in order to clear out some of the coagulated blood, and to permit the discharge of the slough, Where the injury is very considerable, it is sometime necessary to have recourse to amputation. When it may be necessary to adopt this course will depend upon necessary to adopt this course will depend upon the circumstances of each particular case; no gene-ral rule can be laid down regarding it. In military practice, however, it is often necessary to simputate in cases where, in civil practice, it would be scarcely justifiable, from the danger in healing being less, its not requiring so much attention, &c. The best time justifiable, from the danger in healing being less, its not requiring so much attention, &c. The best time for amputating is immediately after the patient has recovered from the depressing affects which usually follow the reception of the wound.—Ref. Hunter on Gunshot Wounds; Guthrie on Gunshot Wounds of the Extremities; Larrey's Mémoires de Oktrurgie Militaire; English Cyclopadia—Arts and Sciences.

GUNTER'S CHAIN, gun'ters, a chain commonly used in the mensuration of land, and so named from its being. invented by Mr. Ganter, a celebrated mathematicism. The chain is 66 feet in length, and is divided into 190 links, of 7.92 inches each; from which arrangement, acre of land is equal to 10 square chains.

GUNWALE, or GUNNEL, guntuel, sing. Sar.), the upper edge of a ship's side; the uppermost wale of a ship, or that piece of timber which unites on either side from the quarter-deck to the forecastie.

side from the quarter-deck to the forecastic.

Gut Manufacturus: (See Cargur Strings.)

Gutta-percha, gut'-ta pert'-shd, the concrete juice of
the Isonandra Gutta, a tree belonging to the fam.

of the Supotacea. (See Isonandra.) It grows abundantly in Singapore, Borneo, and other islands of the
Eastern Archipelago. The tree which is called percha
grows to the diameter of five or six feet, and, on being
patched vialds a milky uite, which saddings after grows to the diameter of five or six rest, and, on being notched, yields a milky juice, which salidies after exposure to the air, forming the gutta-percha of commerce. It is a tough, inelastic substance, becoming soft and plastic at 212°, at which temperature it may be moulded into shape, which it retains without change until it is cool. Its plastic properties render it extremely useful in the arts, and it is much employed for anyting easts and impressions. Rearts ther it extremely useful in the arts, and it is much employed for copying easts and impressions. Beautiful mouldings, picture-trames, and a mumber of ornamental articles, are made from it. It also possess the valuable property of welding together at the see the valuable property of weating edge-ness a more temperature of bolling water. It is a powerful insulator, and is consequently much used for coating the wires for telegraphic purposes. Being impersious to moisture, and resisting the actions of acids and alkalies to a great extent, it is of much use to the chemist as a material for making bottles, carboys, baths, to. It was at one time much used for lathe-bands; but it has was at one time much used for lathe-bands; but it has been superseded in a great measure by those made of vulcanized rubber. It is insoluble in water, but dissolves in benzole, chlosoform, bisulphide of carbon, turpentine, and the essential oils in general. Payen states that the purified gutta-percha of commerce consists of 75 to 80 per cent. of chemically pure gutta-percha, which is insoluble in ether and alcohol, and a white and yellow resin, soluble in boiling sleohol. The crude lumps are imported in the forms of fab. animals. crude lumps are imported in the forms of fish, animals crude lumps are imported in the forms of fish, animals, and blocks, which are softened by boiling water, and passed through a series of kneading, thug, and cutting machines, by means of which are the stones and other solid matters are extracted. It is then sulmitted to the action of mastizators, and rolled fashioned into the desired shape. It may be into thin transparent sheets, which are much particularly important time. Dr. Cattell, of London, has succeed from guite persons of the property to the proper ture. Dr. Cattell, of London, as succeeding gutta-percha so perfectly from a matter, that it presents the appearance its purified condition it is useful for ent purposes.

GUTTA BEBENA. (See AMADEC GUTTIFERE, OF CLUSIAGE a drop; fera, I bear), in Bot gosteen fam., & nat. ord. of Thalamillora, consisting having the following

order are natives occur in Madagascar, it. There are 32 genera L. They are chiefly remark

of South America; Dut. few corner in Madagescar, and on the African continent. There are 32 genera, including about 18 access. They are chiefly remarkable for yielding a fellow gumi-resin of an acrid and purgative mature. In histy cases, however, the frills are edible, and are held in high estimation for their delicione flavour. (See Gancura, Manwar, Masta.) Gurrurals, guf-ta-viels [lat. gutter, the throat), is a mane given, in Grim, to certain sounds formed in the threat or back part of the mouth. In English there are, properly speaking, no gutterals; but the filastials, y and t, are nearly sliced to them. In the Spanish language alone, of those derived from the Latin, see gutterals common. In German, the gutters of the course in Scotch in such words as look. The Arabian language is full of antimals.

Grandle, of a sesser rope or ropes used to steady an extended with. The guy-rope cated laterally on such aids of the central schle, and by being fastened a different intervals, keep the ceble from swaying to such aids of the central schle, and by being fastened a different intervals, keep the ceble from swaying to such aids of the central schle, and by being fastened a different intervals, they the ceble from swaying to such aids of the central schle, and the breaking of a guy-rope figuration is a celebrated hospital of London, founded by Thomas Guy, a wealthy lookseller. The formedation amount of the breaking of a guy-rope figuration is a celebrated hospital of London, founded by Thomas Guy, a wealthy lookseller. The formedation at such as described in January, 1725, a few days after the feagth of the founder, who had reached the ageing 50s. The building of the hospital cost £18,793, and 30 further endowed it with a sum of £219,495; making its all £238,295. In 1839 Mr. Hunt, of Petershain, January and the first promise from the wealth of the founder, who had reached the ageing 43, ports. The annual income of the heaville cost £18,793, and 30 further endowed it with a sum of £219,495; making it all £238,295. In 1

their youth exercises themsel timaked. The gymnasis of the Greeks and Roman in the logical upon as an important part of their educations where you are indeed, devoted more time to the gymnastic fraining of their youths than on all the other department of the youths of their youths of the public gymnasia in it is not the Academia, Lyceum, and Oynosarges, besides sperrel smaller private ones. The administration of these institutions was given to a gymnasiarch, whose duty it was to place the youths under preverteschers, to conduct the games, and you the athlette. In these gymnasia there appear to have been the gift nearly in the second of the gymnasia there appear to have been the gift has a second of the gymnasia there are not not end officers, called the Spikessate or "teachers of wisdom," who seem to have looked after the moral development of the pupils at the gymnasium. The Gymnaste and Paddribe assigned to the youths the different kinds of exercise adapted to the capabilities of each. The Aligne, or adapted to the capabilities of each. The Alipte, or "anointers," a pared the youths for the day's merce. otes, by anointing them with oil, and then sprinking see a Stem with dust. In the gymnasium the principal the sn Chiroless were foot-fitting, wrestling, boxing, leaping,

ose of the modeling them with oil, and then sprinking see a Seem with dust. In the gymnasium the principal the su Chi-class were foot reting, wrestling, boring, leaping, Gumin the erowthrowing, denough, &c.; and the younger pupils in the erowthrowing, denough, &c.; and the younger pupils suffice, which will balk, tops, &c. The sum of the ancients was not one building, but party in 13 to stopic. It generally consisted of twelve pain of the the tier crier portions, where the philosophers, once pot of matter carrier portions, where the philosophers, once pot of matter carrier portions, and ensured the constraints of the continuous after incision to the continuous pupils and the conference of the continuous pupils. The form of the continuous pupils and the conference of the continuous pupils. The form of the continuous pupils where they surpose the fourth six of resin and gum, the pro-

The fifth and sixth : where they covered the the palastra, the piasi wreeting, &c. A sevie was reserved for ball spheristrion. The ay wreetlers contended di there were other zysti, or o some of which were orname unpared alleys used for there was the stadium, covered with sand, and surround tators; and the baths, which apartments. In Rome, during were no buildings which could be Greek gymnsits. Under the On-bore some resemblance to then bore some resemblimes to the may be said to have disapped. The name is employed, in the pube ligher class of schools in the intended to be immediately present. intended to be immediately a versity. The gymnasis differ (realectules), which are intendeducation for such as are distract, in laying as their oble mental and scientific education for he universities. The countends over air or across year and Greek, history, geography and bible thousedge, suching a natural history, Garman, From The scholars leave should the su the university; but on leaving the university; but it leaving the Prussia at least) to undergo a verbefore they can enter the university cannot pass from one class; if you attisfactory evidence that by their instructions. Not a few at demned to spend two years in one cla is appointed by government for the

such as intend entering the university through a granasium.

Gyranasium, "sease-tike (Gr. one gumnes taked), a term applied to the the body and taked, a term applied to the develop their parent. Gyranastic gas ancient origin. They are maniformatical took of the Iliad, where playing at yet hurling are mentioned; and in the IR Achille is represented as instituting of Patroclus, in which the sports were boxing, weastling, quoit-throwing, &c. of this kind were dedicated to the gowards being coaled athia, gave origin.

athleta, applied to those who coaless. wards being called athia, gave or athleta, applied to those who of Shorthy before the time of Mine were made a part of medicine, were reduced into a complete or ings, called symmetric, were received officer; for their superintendence the state. The Romans received or locant scale; and or accounts floort scale; and on sees which were attached to the con This therme. Among the excension, were ing, quoit-throwing, as which formed the regular were riding, driving, a ropes, swinging, mock f Various causes in later, in gymnastics to go out depends so much an

such as intend entering the university

# Gymnastics

of a kind offensive to the government, they were of a kind offeneive to the government, they were abolished in 1886. The practice of gymastics was, however, kept up by the troops, and with such evident success that a similar course of training was adopted in the French army in 1844. England was late in recognizing the advantages of this kind of training; but the troops at Aldershot and other camps are now out the troops at Autorian and other temps are now regularly instructed in the science. Gymnasis have, however, been long in use in private life in this country. The gymnastic exercises adopted by the puglists and wregulers of the present day in their course of training are not able to produce on the mind or body any de-sirable effect; and the same was observed in the con-dition of the athletæ of old. But gymnastic exercises, dition of the stricts of old. But gymnastic exercises, practized under proper control, must act beneficially, both mentally and physically. As Montaigne observes, "It is a soul, not a body only, which we educate; it is a man, of whom we must not make two; we must not train the one without the other, but must guide and lead them like a pair of horses harnessed to one shaft." lead them like a pair of horses harnessed to one shaft."

Gymnastics act upon the courage, and produce independence and presence of mind. Besides being a suitable interruption to mental labour, and the best recreation after it, they produce cheerfulness, and restrict the fancy and imagination to reasonable limits. "If you wish to develop the mind of a pupil," says Rousseau, "develop the power which that mind has to govern; exercise his body make him healthy and strong, that you may make him prudent and reasonable." The gymnastic system of Ling, referred to in the article Education, is considered one of the to in the article EDUCATION, is considered one of the best methods of training now in use. Under the name of free exercises, in Ling's system, are included such exercises as are performed without the help of technical apparatus, such as ropes, ladders, dumb-bells, &c. The different species of free exercises consist, first, in movements of the limbs on the spot, and without reciprocal support; second, in movements from the spot, and without support; third, in movements with supand without support; third, in movements with sup-port; fourth, in wrestling exercises; and fifth, in the exercises belonging to asthetic symnastics. The free-dom of Ling's method from violent exertion, and the dom of Ling's method from violent exertion, and the physiological principles on which it is founded, render it superior to every other system. In general all methods of instruction are divided into a number of courses regularly graduated, beginning with elementary and particular movements, so as to render every part of the body pliant, and to develop the muscles. These exercises are called elementary gymnastics; while exercises in leaping, vaulting, climbing, swinging, walking on stilts, &c., are called applied gymnastics. In ordinary gymnasia, the principal apparatus employed consists of the horizontal pole, the parallel bars, the masts or poles, the ropes, the triangle and rapize, the ladder, the wooden horse, the inclined plane, and the flying-course, or giant's stride. The rapize, the ladder, the wooden horse, the inclined plane, and the flying-course, or giant's stride. The norizontal pole is used in order to develop the strength of the hands and arms, though many other exercises are performed on it. The parallel bars are mostly about 8 feet long, and fixed about 2 feet apart, at a height of 30r 4 feet from the ground. The exercises upon them, which are of great variety, tend to strengthen the arms and chest, and to render the body pliant. The masts and poles, which vary in their inclination, are used for climbing purposes. The triangle and tra-The masts and poles, which vary in their inclination, are add for climbing purposes. The triangle and trapes for modern gymnasia, as the lightness of their contruction, and their being constantly in motion, make the evolutions performed on them appear easy and graceful. The wooden ladder and the rope ladder graceful. The wooden ladder and the rope ladder are used generally to render the body supple. The wooden horse, which can be lowered or raised on its stand when required, is for exercise in vaulting and caping. The inclined plane, usually a deal plank, between 20 and these in length and 2 feet in breadth, sused for a variety of exercises, tending to strengthen the hands, arms, chest, aldomen, legs, and feet. The flying-course, or giant's stride, is an amusing exercise, but is not superior to any of the others in its effects. Then national games of England by themselves contain nearly all the advantages to be got by gymnastic exercise. These games, although not all, perhaps, originally belonging to this country, have been adopted, and have become peculiarly national through their oppularity and regular improvement. Wrestling, a sused for a variety of exercises, tending to strengthen he hands, arms, chest, abdomen, legs, and feet. The flying-course, or giant's stride, is an amusing exercise, but is not superior to any of the others in its effects. The national games of England by themselves contain nearly all the advantages to be got by gymnastic sercise. These games, although not all, perhaps, perms are made into a distinct class (Gymnogens) in circles. These games, although not all, perhaps, sperms are made into a distinct class (Gymnogens) in circles are greatly and regular improvement. Wrestling, a Dicotyledones. (See Angiosperms.)

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### Gymnosperms

thoroughly English athletic sport, is only known theoretically on the continent. Boxing, an exercise which brings every muscle into actions gives elasticity to the limbs, improves the play of the lungs, gives quickness of eye and accuracy in measuring distances, is a practice particularly belonging to this country. As a nation, also, our recorded feats in riding, walking, and running, may challenge all Europe. Archery, from a very early period, has been a favourite pastime in which the English have excelled. The game of cricket is essentially English, and other games, such as golf and the English have excelled. The game of cricket is essentially English, and other games, such as golf and curling, belong almost exclusively to Soctland. In all cases gymnastic exercises of every kind should be practised with caution and moderation. Although the dangers connected with the practice of gymnastics are often exaggerated, nevertheless muscles may become strained through excess, and ruptures and other serious accidents occur.—Ref. Capt. Chioseo's Gymnastics and Calisthenics; G. Roland's Gymnastics Walker's British Manly Exercises; and the Gymnastic Free Exercises of P. H. Ling, translated by M. Roth, M.D.

GYMNEMA, jim-ne'-mā (Gr. gumnos, naked; nema.

GTENEMA, jim-ne'-mā (Gr. gumnos, naked; nema, filament), in Bot., a gen. of the nat. ord. Asclepiadacca. The species Galactifera, a native of Ceylon, yields a nutritious milk, which is used as human food. It is

called, on this account, the cow-plant.

Caused, on this account, the cow-plant.

GYMNOGENS, juin-no-jens (Gr. gumnos, naked; gennao, I produce), a term applied in Lindley's Botany to
those plants which are distinguished by having the
seeds naked, or uninclosed by seed-vessels. The
plants included in this class have nearly an equal
relation to flowering and flowerless plants. They
agree with the former in habit, in the presence of
sexes, and in their vascular tissue being complete;
among the latter, some accord in habit with the former among the latter, some accord in habit with the ferns and club-mosses. So great is the resemblance between some club-mosses and certain conifers, that they can be distinguished by no other external character except their size. Gymnogens are known from most other vasculares by the vessels of their wood having large apparent perforations or discs; they do not, however, differ in growth from other exogens, but are essentially differ in growth from other exogens, out are essentially the same, deviating in no respect from the plan upon which exogenous plants increase. In the gymnogens there is an unmistakable transition from the highest form of organization to the lowest. They are essentially exogens in all that appertains to their organs of vegetation, but they are analogous to reptiles, in the chimal kingdom, inasmuch as their ove are fertilized by direct contact with the male principle. The Confers and Cycads are the most remarkable orders. That of the Conifers is connected with club-mosses by means of the extinct genus Lepidodendron, and their branches sometimes so closely resemble those of certain lycopods that no doubt can be left of their relation. Some cycads

that no doubt can be left of their relation. Some eyeads have the gyrate vernation of the leaves of true ferns along with the inflorescence of conifers. The natural orders of the gymnogens are,—the Cycadaceæ, the Pinaceæ, the Taxaceæ, and the Gnetaceæ.

GYMNOSOPHISTS, jim-nos'-o-fists (Gr. gwmns, naked, and sophistes, a wise man), the name given by the sucient Greeks to a sect of Indian philosophers who went about naked, or almost naked. They dwelt in the woods, living on the wild products of the earth, and had a great reputation for learning and wisdom. They spent their time in mystical contemplation, and practised the most rigorous ascellation. Their most prominent tenet was the doctrine of the immortality and transmigration of the soul, and they were remarkpromuent tenet was the doctrine of the immortality and transmigration of the soul, and they were remarkable for their great contempt of death. They despised bodily pain, and inured themselves to the greatest tortures without manifesting the least indications of suffering. They practised suicide by burning, and in this way Calanus sacrificed himself at Babylon before Alexander the Great.

### Gymnotus Electricus

GYMMOTUS ELECTRICUS. (See ELECTRICAL ERL.)
GYMMOTUS. (See GYMOSEMPILE.)
GYMMOTUS, jo-re'-shops (Gr., game, female; cikes, houss), in Bot. a term applied to the female or pistiline organs of a flowering plant taken collectively.
(See Previl.)

GYNOPHORE. (See RECEPTACLE.)

CTHOREMIUM, jin-on-te-me-um (Gr. gune, female; etemma, grown), in Bot., a column formed in the centre of a flower by the complete union of the upper parts of the stamens and the pistil. Examples are afforded by the orchis and birthwort. Flowers that show this

GYESTER, jip'-seer, a term derived from a corruption of the word Egyptiane, and applied to a wandering race of people, who are found distributed over many countries of Europe and Asia. They seem to have migrated into Europe from the East, at the beginning of the 15th century; and first appeared in Faris in 1427, representing themselves as Christian penitents, 1427, representing themselves as Christian penitents, driven out of Egypt by the Saracens. They were more than a hundred and twenty in number, and, according to a French writer, "They had their ears pierced from which depended a ring of silver; their hair was black and crispy, and their women filthy to a degree, and were sorceresses, who told fortunes." They and their people, who arrived in great numbers, obtained permission to remain in the kingdom; but after a short while or account of their illeges and depredetions. while, on account of their idleness and depredations, terrible laws were enacted, in order to suppress them and drive them from the country. The name of "Bohemians" was given to them by the French, probably because a large number of them had come into France through Bohemia. Many, in consequence of the severity shown towards them, ware duran body into through Bohemia. Many, in consequence of the severity shown towards them, were driven back into the woods and forests of the same country; others passed into Germany and Hungary; while bands of others swarmed over the Pyrenees, and poured down upon the plains of Spain. The names by which the gypaies are known, differ with the country in which they are found, although, with one or two exceptions, not materially. In Russia they are styled Zigani; in Turkey and Persia, Zingarri; and in Germany, Zigenner; all which words apparently spring from the same root, probably "Zincali," a term by which these people, and especially those of Spain, which these people, and especially those of Spain, cometimes designate themselves, and the meaning of which is supposed to be "the black men of Zend, or Ind." The Zigani are found in all parts of Russis, except in the government of St. Peteraburg, from which they have been banished. Their principle employment is trafficking in horses and curing the diseases of cattle. In Moscow, however, they have given no their wandering habits, and inhabit stately given up their wandering habits, and inhabit stately houses, and go abroad in elegant carriages, being be-hind the higher orders of the Russians neither in appearance nor mental acquirements. The females are celebrated for their vocal powers. The Czigamy, or Hungarian gypsies, live in rags and filth, but are nerry, and fond of music. They are addicted to horsedealing, and are tinkers and smiths in a small way; the women cell fortunes, and both sexes are incorrigible thieves. In Wallachia and Moldavia, they call them-selves Roumouni, and in all countries the gypsies style themselves, and the language which they speak, Romnemetives, and the language which they speak, Rommany. In the gypsy language, Rom means a husband, and Rommany the sect of the husbands. Although no country appears less adapted for this wandering life, which seems so natural to these people, than England, it is nevertheless true that they do exist here, and the covered cart and little tent of the Rommanny seldom remain more than a day or two in one place. When the gypsies first arrived in England, they were much persecuted. After a time their persecutors got weary of pursuing them, and at present they are con-sidered in some degree as a privileged people. Although their way of life is unlawful, it is connived at, the law of their way of life is unlawful, it is connived at, the law of England having discovered, by experience, that its utmost fury is inefficient to restrain them from their habits. The male gypsies in England are all dealers in horses, and sometimes employ their idle time in yielding the tin and copper utensils of the peasantry; the females tell fortenes. In all countries the gypsies are very handsome when young, but hideously ugly when they grow old. The climate of England is favour-

## Gyroscope

able to beauty, and in no land is the appearance gypsy so preposessing as in this country. The design of the Rommanny which they apock is thereoff pies, but mixed with English words. Debting in some has always been a profession of the gypsissing. I have and countries, and is especially the precince of the females. They are divided into chases or index in England, and the principal gypsy tribes now in existence are the Stanleys, whose haunt is the New Forcest; the Lovells, who are fond of London and its vicinity; the Coopers, who live round about Windsor; the Smiths, who have taken up their abode in East Angles, and the Hernes, who have appropriated the North of England, and Yorkshire in especial. able to beauty, and in no land is the appear England, and Yorkshire in especial.

GYPSOPRILA. (See CARYOPHYLIACER.)
GYPSUM, jip'-sum (Lat.), a term applied to smorphous sulphate of lime, from which plaster of Paris It is also found in crystals as selenits, in emitransparent masses as alabaster. It has is made. compact semitransparent masses as alabaster. compact semitransparent masses as alabaster. It has evidently been formed by the decomposition of the iron pyrites, giving rise to sulphuric said, which, uniting with the chalk, formed 'sulphate of lime. Plaster of Paris is made by heating gypsum to about 250° Tahr., and powdering the calcined mass. Gypsum is also used as a manure. The addition of 1 or 2 per cent. of many saits, such as alum, sulphate of potash, or borax, confers upon gypsum the property of setting slowly into a mass capable of receiving a very hich nolish into a mass capable of receiving a very high polish. When treated in this way, it is known as Keane's.

Martin's, and Keating's coment. A GYS-FALCON. (See GYB-FALCON.)
GYBOMANCY, jir'-o-min-see (Gr. guros, a circle, and manteia, a prophecy), is a kind of divination performed by a soothsayer, by means of a circle. The soothsayer usually describes a circle variously marked with lefters. usually describes a circle variously marked with letters, and then walks round it with various ceremonies, say-

ing magic words and making mysterious motions, the more effectually to deceive the uninitiated.

Gyrofunda, je-rofu-rā, in Bot., a gen. of lichens, several species of which possess nutritive properties, and are used as food in the arctic regions. They been denominated tripe de roche (rock-tripe). Franklin and his companions, in 1821, used them, and indeed owed their preservation, in a great measure, to the nutriment they afforded. The species *G. pustulata* is one of the lichens used in this country by the manu-

facturers of orchil and cudbear.

GYROSCOPE, ji'-ros-kope (vir. guros, & circle or ro-ation: skopeo, I perceive), an instrument which has recently attracted attention on account of its supposed capability of rendering visible the rotation of the on its axis. The apparatus was originally suggested by M. Foucault, tut has since been materially modified. The principle on which its action depends was discovered about 1750, by Frisi, and enunciated by him as the Composition of Rotary Motions; and the object of the instrument is to exhibit the real composition of rotations about different axes impressed at the same rotations about different axes impressed at the same time on the same body. Thus, when a body is rotating about an axis, if any force tends to make it rotate about another axis, it will not rotate about either the old or the new axis, but about an intermediate one. In 1851, Signor Antinori, director of the museum at Elegance fast branchit the subject of the greatest time. Florence, first brought the subject of the apparent dis-placement of the plane of vibration of the pendulum efore the Academicians del Cimento; and on the 3rd of February, in the same year, M. Foncault communicated his discovery to the Academy of Sciences at cated his discovery to the Academy or sciences are Paris, and experimentally proved the rotation of the earth by his well-known pendulum experiment and his gyroscope. In the first case, if a pendulum is supposed to be suspended over either pole of the earth, and set in oscillation, it is evident that a spectator carried round by the rotation of the earth would so pass alternately under the two ends of the arc of the vibrating pendulum, that its plane of scillation would appear to him to make a revolution from east to west in the same time as the earth revolves from west to cast. If, then, the pendulum be supposed to be similarly suspended over the equator, it is evident that no change in the plane of oscillation can take place. But if the pendulum is suspended at any intermediate latitude, the rotation of the earth round the polar axis may be considered as the resultant of two rotations, one round an axis passing through the place of observa-